MARCH ISSUE

SUTRA

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OESOPHAGUS EDITION

THE NEWSLETTER OF THE INDIAN ASSOCIATION OF SURGICAL GASTROENTEROLOGY

WHY SUTRA?

The Many Threads of "Sutra": A Sanskrit Word's Rich Tapestry

The Sanskrit word "Sutra" literally means "thread", "cord" or "string", forms a foundational concept in Indian intellectual and religious traditions, weaving altogether meanings far beyond its simple material origin. Its significance unfolds across multiple dimensions:

Literal and Practical

At its most basic, a sutra is a physical thread used for sewing, binding, or measuring – the essential tool holding disparate elements together. This tangible sense underpins its profound metaphorical extensions.

Philosophical and Scientific Code

Most famously "Sutra" refers to an extremely concise aphorism or rule. These are dense, formulaic statements designed to encapsulate vast areas of knowledge – philosophy, grammar (*like Panini's Ashtadhyayi*), law, ritual mathematics or statecraft (*e.g., Kautilya's Arthashastra*). Their brevity was mnemonic, aiding oral transmission. Think of them as "threads" upon which the pearls of complex knowledge were strung, requiring later commentary (*bhashya*) to unravel their full meaning.

Sacred Scripture

In religious contexts, particularly Buddhism and Hinduism, "Sutra" denotes a category of canonical scripture. Buddhist Sutra (Like the Lotus Sutra and the Heart Sutra) typically record discourses attributed to the Buddha, expounding doctrine and practice. Hindu Sutras (like Brahma Sutras, Yoga Sutras of Patanjali, or various Dharma Sutras) are often collections of those concise aphorisms systematizing theological, ritual, ethical, or meditative knowledge within specific schools.

Structural Principle

The concept of a "thread" implies connection and structure. Sutras serve as the core framework, the essential connecting threads, upon which larger bodies of commentary, explanation, and elaboration are built. They provide the skeletal structure holding the flesh of the tradition together.

Characteristic Brevity

The defining feature of a sutra text is the extreme conciseness. Authors aimed to express the maximum meaning in minimum words, often omitting connectives and grammatical particles. This compression made them potent but also necessitated expert interpretation.

In essence, "Sutra" embodies the act of binding knowledge. From the literal thread, it evolved into the metaphorical thread connecting ideas, the compressed code preserving wisdom, the foundational text structuring religious paths, and the principle of brevity demanding deep engagement.

It represents the elegant, efficient "threading together" of complex thought into a portable, enduring form – a testament to the power of language to weave intricate tapestries of meaning from the simplest of beginnings.

Suggested by Dr. Gayatri Balachandran

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Condolence Message

Dr. Jai Dev Wig

May 22, 1945 – March 15, 2026

Dear Esteemed Members, Colleagues, and Friends

With profound sorrow I, on behalf the Indian Association of Surgical Gastroenterology (IASG), announce the sad demise of our revered Past President, Dr. J.D. Wig. Dr. Wig was a towering figure in our field—a visionary surgeon, and a true pioneer whose contributions to surgical gastroenterology shaped the very foundation of IASG.

His dedication, clinical excellence, and hard work touched countless lives through his compassion and wisdom. We have lost a giant, but his legacy will continue to guide and inspire generations of surgeons.
On behalf of the entire IASG family, I extend our deepest condolences to Dr. Wig's family, friends, and loved ones. May you find strength in this hour of grief. Let us honor his memory by upholding the values he championed.

Om Shanti | T D Yadav | On Behalf of IASG

DR. T. D. YADAV

President, IASG

MESSAGE FROM THE PRESIDENT, IASG

Ladies and gentlemen, colleagues, and friends,

It is with profound grief we pause to remember a towering figure in our specialty: Professor Jai Dev Wig, a distinguished Past President of the Indian Association of Surgical Gastroenterology, former Professor and Head of the Department of General Surgery, PGIMER, Chandigarh, and one of India's most respected pancreatic and gastrointestinal surgeons.

He passed MBBS in 1967 from GMCH, Amritsar, MS in 1971 from PGI, Chandigarh, FRCS, Royal College of Surgeons 1975. Joined PGI as registrar 1971-74, Lecturer in July 1976, and Asst Prof in July 1981. After his Superannuation from PGI in 2008, he joined GMCH 32 for 1 year and after that joined Fortis hospital Mohali. His published books: Surgical Gastroenterology I, 1986, Surgical GE II 1988, surgical GE III 1994, and The Pancreas 2000.

Prof. Wig's contributions to pancreatic surgery were both clinical and academic. His meticulous work on complex pancreatic and GI cancers helped set national benchmarks for safety, outcomes, and multidisciplinary care. His expertise and leadership elevated the standards of training and practice at PGIMER, shaping generations of surgical gastroenterologists across the country.

His service to the profession was recognized with the prestigious Dr. B.C. Roy Award in 2001 for eminent medical teacher, one of the highest national honours in medicine, underscoring his lifelong commitment to excellence, teaching, and patientcentred care. Furthermore, he authored a major book on the pancreas, which has become a valuable reference for surgeons and physicians, consolidating knowledge on pancreatic anatomy, pathology, and surgical management for a wide audience.

We shall promise ourselves to carry forward his legacy by pursuing the same standards of scientific rigour, ethical practice, and compassionate care that he exemplified. His work continues to guide our discussions, our techniques, and our approach to difficult pancreatic and gastrointestinal diseases.

We extend our heartfelt condolences to his family, friends, colleagues at PGIMER and beyond, and to all who had the privilege of learning from him. May his memory inspire every surgeon present today to grow not only in skill but also in character.

Dr.T.D.Yadav
President, IASG

DR.SUJOY PAL

Secretary
IASG

MESSAGE FROM THE SECRETARY

It gives us immense pleasure to present to you the inaugural edition of the IASG Newsletter — a new initiative that aims to serve as a vibrant platform for sharing knowledge, fostering collaboration, and celebrating the advancements in the dynamic field of Surgical Gastroenterology.

This quarterly newsletter is conceived as a space where the collective wisdom and experiences of our community can be shared, discussed, and preserved. In each edition, you will find insightful interviews with eminent surgeons and revered teachers, offering reflections on their journeys, surgical philosophies, and vision for the future.

We will also bring to your attention updates on key activities and developments in Surgical Gastroenterology, both from India and around the globe — including recent clinical advancements, noteworthy publications, surgical innovations, and journal scans of interest to our specialty. In addition, the newsletter will keep you informed about important conferences, meetings, and academic events, along with messages and announcements relevant to our membership.

As the field continues to evolve rapidly, it is vital for us to stay connected and informed. This newsletter aspires to be both a resource and a reflection of our vibrant professional community.

To get this project going I would like to personally thank the 6-membered IASG Newsletter team led by Dr P Radhakrishna. The members are Drs Magnus Mansard, Gayatri Balachandran, Deeksha Kapoor, , Shraddha Patkar and Nisha jain .

We invite you to engage with it actively — as readers, contributors, and critics — so we can continue to grow stronger together. Your feedback and suggestions will be invaluable in shaping future editions.

Dr.Sujoy Pal
Secretary
IASG

Dr.Patta Radhakrishna

Executive editor
"SUTRA"

MESSAGE FROM THE EXECUTIVE EDITOR

Dear readers!

At the outset, apologies for the inordinate delay in bringing out this special 'issue' on oesophagus. Some of the factors responsible for the delay are not in our control. We promise to be punctual from the next issue onwards.

'Oesophagus' strangely is a part of the gastrointestinal tract located in the chest and hence was sort of an orphan for quite a while. It used to be a thoracic surgeon's domain for a long time till GI surgeons, especially in India had started taking interest in it and had attempted to approach it from the abdomen with reasonable success. When the 'three field lymphadenectomy' came into vogue, trans-hiatal esophagectomy being a blind procedure slowly faded away and trans-thoracic procedures came into vogue. Surgical Oncologists soon took to oesophagus like fish to water and became aggressive with lymphadenectomy.

Advent of thoracoscopy and later robotic surgery made 'Oesophageal surgery' very attractive, and a new generation of Oesophageal surgeons spawned, most of them being trained surgical oncologists who often operate on cancer from head to toe.

In this special issue on oesophagus in 'Sutra', we have started with an interview with Dr.Chatterjee, who is one of the pioneering Oesophageal surgeons in India. Dr.MP Sreejayan, an Oesophageal surgeon of repute from Calicut wrote about his days with Dr.S.M.Chandramohan who is known for his expertise in treating Oesophageal strictures. He also wrote about the evolution of Oesophageal surgery In Calicut Medical College.

We also have UpToDate articles on Oesophageal surgery from Tata Memorial Hospital and Basavatharakam cancer centre in Hyderabad. We also have our regular features of quiz, conference updates and a lot more.

I thank the entire editorial team for their relentless hard work in bringing this issue by constantly pestering the various authors and nudging me every now and then. Please go through the entire issue and mail your valuable comments to the mail ID provided elsewhere in this issue. The next issue of 'Sutra' will be on 'Portal Hypertension' and please feel free to contribute your writeups, share your work and miscellany in the field of 'Portal Hypertension' in India.

Dr.Patta Radhakrishna
Director, GI and Minimal Access Surgery
SIMS Hospital, Chennai.
'Executive Editor'

Dr.Magnus Jayaraj Mansard

Editor - in - chief
"SUTRA"

MESSAGE FROM THE EDITOR-IN-CHEIF

Dear Colleagues,

The esophagus—hidden within the rib cage, coursing behind the heart—has long remained beyond the comfortable reach of conventional surgical gastroenterology, which traditionally operates within the abdomen. Diseases of the food pipe demand more than technical familiarity; they require a special breed of surgeons willing to work in narrow spaces, around vital structures, and often at the limits of physiology.

This issue of our newsletter is devoted to that uncommon territory and to the surgeons who chose to enter it. The articles that follow trace the evolution of Oesophageal surgery from an era of courage and palliation to one defined by precision, technology, and multidisciplinary care.

We begin by looking back—at institutions and individuals who laid the foundations of Oesophageal surgery in India when resources were limited and outcomes uncertain. As the narrative moves forward,esophagectomy evolves from an individual act of courage into a collective enterprise. Several contributions in this issue deal with judgment forged over time—particularly in corrosive strictures and complex reconstructions. From there, the focus shifts to evolution. Whether it is minimally invasive positioning strategies, fluorescence guidance, nerve monitoring, or endoscopic vacuum therapy, technology appears here as an enabler of principles that remain timeless: respect for anatomy, preservation of function, and anticipation of complications.

Finally, the case discussions and technical articles that follow reinforce why Oesophageal surgery remains uniquely demanding and continues to command humility. These cases reinforce the importance of planning, restraint, and respect for anatomy—qualities that define maturity in Oesophageal surgery.

Taken together, this issue is not merely about techniques or outcomes. It is about remembering where we came from, understanding where we stand, and preparing those who will take this demanding craft forward. As editor-in-chief, I am proud to present this collection of experiences, lessons, and innovations.

Dr Magnus Jayaraj Mansard
Lead Liver Transplant Surgeon
GEM Hospital, Chennai
Editor-in-Chief
" Sutra "

The Cradle of Oesophageal Surgery in North Kerala

Government Medical College, Calicut

Government Medical College, Calicut has nurtured young minds, instilled surgical discipline, and encouraged critical thinking. Many surgeons who trained here carried the ethos of this institution across Kerala and beyond—to serve first, to innovate cautiously, and to never abandon the patient. Institution has played a vital role in training generations of surgeons. It provided not only surgical exposure but also values that cannot be taught in textbooks: humility in success, resilience in complications, and compassion in palliation.

For many of us, including myself, Government Medical College, Calicut was where the spark was lit—where observation turned into aspiration, and aspiration into lifelong commitment.

Looking back at the landscape of Oesophageal surgery in Calicut, one realizes that we have traversed a long and arduous path. It is a journey from an era of limited resources and daunting open procedures to the present day of minimally invasive precision.No account of the history of Oesophageal surgery in Calicut would be complete without acknowledging the monumental role played by Government Medical College, Calicut. For decades, this institution has been more than a teaching hospital—it has been the cradle where complex surgical ideas were tested, refined, and passed on across generations.

Dr.M.P.Sreejayan (right) with Prof.P.S.Varrior

At a time when diagnostic tools were limited, infrastructure was modest, and postoperative care was challenging, Government Medical College, Calicut stood as the sole referral center for patients with Oesophageal diseases from North Kerala and neighboring regions. The sheer volume of advanced cases that presented here provided excellent clinical exposure and supported surgical courage.

It was within these wards and operating theatres that pioneers like Professor Sankarankutty Varrior, along with Professor K. P. Rajagopal, Professor P. Rajan, and Professor K. K. Rajan, transformed Oesophageal surgery from an occasional undertaking into a structured surgical practice. Their commitment, perseverance, and willingness to operate in the face of uncertainty laid the foundation for what we now consider standard Oesophageal care.

As technology advances and minimally invasive platforms redefine Oesophageal surgery, the contributions of Government Medical College, Calicut remain timeless. The institution's legacy lives on—not merely in numbers or statistics, but in every patient who could eat again, even if only for a while, and in every surgeon who learned that surgery is as much about humanity as it is about technique.

History of Oesophageal Surgery in Calicut - From Palliation to Precision

Oesophageal cancer has never been a rare disease in Calicut. The incidence was significant even in the early decades, but diagnosis was usually late, and treatment options were limited. In those days, the primary modality of treatment was radiation therapy, and only a very small number of surgeons ventured into operating on the esophagus. Esophagectomy was considered a formidable procedure, both for the patient and the surgeon, due to the complexity of the procedure and fatal complications

Era of Limited Investigations

Diagnostic facilities were rudimentary. Rigid esophagoscopy was performed mainly by cardiovascular and thoracic surgeons, while flexible endoscopy was carried out by medical gastroenterologists—most notably Professor Vinayachandran Nair,Dr Shobhanadevi and Dr Varghese Thomas who played a crucial role in endoscopic diagnosis.

The other commonly used investigation was the barium swallow. CT scanning was not available in Calicut until 1987, severely limiting staging and preoperative assessment. Once a diagnosis was made, most specialists preferred to refer patients directly to the Radiation Therapy Department, as surgeons were generally reluctant to undertake esophagectomy. Consequently, patients almost always presented at an advanced stage, with severe dysphagia and poor nutritional status.

The Pioneer: Professor Sankarankutty Varrior

A major turning point in the history of Oesophageal surgery in Calicut was Professor Sankarankutty Varrior, who had received his surgical training in Pune. He was truly a pioneer and among the first surgeons in Calicut to consistently operate on Oesophageal cancers.

I vividly remember one of his often-quoted

principles:

“If you can help the patient to eat or drink, that itself is one of the best forms of palliation. So operate, and make them eat till they die.”

This philosophy shaped an entire generation of surgeons.

Professor Varrior mainly operated on mid and lower Oesophageal lesions, and three surgical procedures were popular during that era.

1. Transabdominal Esophagectomy

This involved transabdominal esophagectomy with either upper partial gastrectomy or total gastrectomy, followed by reconstruction using the stomach or jejunum (Roux-en-Y or loop). Margin clearance was a real concern, as both microscopic and macroscopic positive margins were possible due to compromised anastomotic margins especially in advanced lesions . Frozen section was not practiced at that time, and hence transabdominal surgery required extreme caution to avoid oncological compromise.

There were no staplers available. Every anastomosis was hand-sewn, usually with 2-0 Ethibond. The posterior layer of the anastomosis was sutured first. Two stay sutures were placed on either side of the esophagus and conduit. After placing 4–6 interrupted sutures, the parachuting technique was used to approximate the ends after placing the posterior sutures .careful placement of the posterior sutures are required to avoid Suture entanglement . The anterior layer was relatively easier to complete thereafter.

The quality of illumination cannot be compared with present-day operating lights and headlights—we worked under conditions that would be unimaginable today.

2. Ivor Lewis Esophagectomy

The Ivor Lewis procedure, involving laparotomy followed by thoracotomy, was the next major option. Even today, it remains one of the best Oesophageal surgeries, now performed through open, laparoscopic, thoracoscopic, and hybrid approaches.

Margin clearance was not a major issue with this technique. Although most patients had advanced disease, resection and anastomosis were performed primarily to relieve dysphagia and improve quality of life. Reconstruction was done using either the stomach or jejunum.

3. Garlock’s Procedure (Left Thoracoabdominal Esophagectomy)

The third popular procedure was Garlock’s operation, or left

thoracoabdominal esophagectomy. Even today, it is occasionally performed by a few senior surgeons. I personally performed a good number of these operations, though I was never fully satisfied with the approach.

The procedure involved dividing both rectus muscles, costal cartilage, and entering the chest through the 7th or 8th intercostal space. The diaphragm was divided carefully to protect the phrenic nerve. Mobilization of the lower esophagus was extremely challenging due to the beating left ventricle and the left lung, which frequently obstructed the field.

With experience, I realized that other approaches were far less tiring and equally effective. I have completely abandoned this procedure, and in the era of minimally invasive surgery, I firmly believe there is no role for such extensive operations. Thoracoscopy has revolutionized Oesophageal surgery, benefiting both patient comfort and surgeon endurance.

Legacy and Mentorship

Professor Varrior is estimated to have performed around 400 esophagectomies. Alongside him, Professor K. P. Rajagopal, and the next generation—Professor P. Rajan and Professor K. K. Rajan—contributed immensely to Oesophageal surgery in Calicut.

I was fortunate to work with all of them. My interest in Oesophageal surgery was ignited in 1992, when I began my surgical career by observing and assisting Professor Varrior, and was later fine-tuned under Professor P. Rajan.

I actively searched for further training to make Calicut a Center of Excellence for Oesophageal surgery. While the early days gave me the foundation, I soon realized that to conquer the complexities of the esophagus, I needed to look beyond the horizon. I was on a constant lookout for further training to refine my techniques. This search led me to a turning point that would define the rest of my career , meeting Professor S.M. Chandramohan in Chennai. An International Odyssey. My journey involved a grueling but rewarding schedule. I would often catch the 6:40 AM flight from Calicut to Chennai, assist him in surgeries at Royapettah, and return by the 7:00 PM flight. On days with heavy caseloads, I stayed back, attending back-to-back cases at both Royapettah and St. Isabel's Hospital, witnessing two different infrastructural worlds.

Prof. Chandramohan opened doors for me that I didn't know existed. Under his guidance, I began my international pilgrimage to master Oesophageal surgery.

Hong Kong ... The Pioneers of VATS

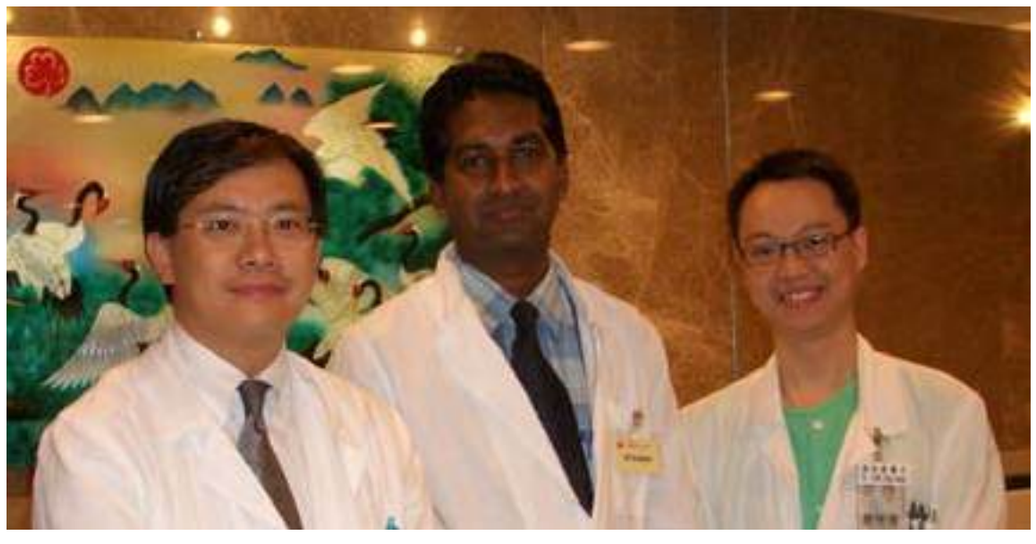
My first stop was Queen Mary Hospital, University of Hong Kong. There, I trained under Professor John Wong and Professor Simon Law, the pioneers of Video-Assisted Thoracic Surgery (VATS). Prof. Simon Law, whose chapters appear in textbooks like Maingot's and Mastery of Surgery, remains a close associate to this day.

Tokyo ... The Art of Precision

Next, I met Professor Masahiko Tsurumaru, the immediate assistant to the legendary Prof. Akiyama—the originators of the 3-field Lymphadenectomy. He invited me to Juntendo University in Tokyo. Watching them perform three cases a day was mesmerizing; the Japanese style of dissection is a visual treat, defined by absolute meticulousness. Tokyo was one place where, had circumstances permitted, I would have loved to stay forever.

USA ... The Giant of Ann Arbor

Prof.P.Rajan and Prof.K.P.Rajagopal



Prof.Simon Law

Finally, I wrote to Professor Mark B. Orringer at the University of Michigan, the originator of the Transhiatal Esophagectomy. His only condition for accepting me was: "If Dr. Chandramohan recommends you, I have no further questions."

Prof. Orringer, then President of the American Thoracic Surgery Association, was a towering personality yet incredibly simple. He would drive me from my stay to the hospital and drop me back

Dr.MP Sreejayan with Prof.Tsurumaru

late in the evening. He found time to take me to restaurants, ice cream shops, and even his home. These interactions with international giants reshaped my worldview.

The Evolution of Technique

Armed with this global exposure, I returned to refine our work in Calicut. I initially performed open procedures like the Transhiatal (Orringer's), Ivor-Lewis, and McKeown esophagectomies. We utilized gastric, jejunal, and colonic pull-ups, achieving excellent results in various situations including corrosive strictures and post-radiation failures in post cricoid cancers

We moved away from end-to-end anastomosis, adopting a wide side-to-side anastomosis. This shift was crucial; our leak rate dropped to less than 5%, and strictures became almost non-existent.

However, the "open" era was physically demanding. Surgeries lasted around 8 hours. Many colleagues, including anaesthetiologists, were exhausted by the duration. I often saw peers lying flat on the theater floor from fatigue, though I pushed on.

The Minimally Invasive Revolution

In 2010, I made a decisive shift. I decided to convert all procedures to minimally invasive methods. We completely replaced thoracotomy with thoracoscopy.

Today, 99% of our Oesophageal procedures are performed thoracoscopically. This has revolutionized the comfort of both the patient and the surgeon. We have successfully performed around 500 surgeries covering the full spectrum of benign and malignant conditions.

Postoperative Challenges... The Dark Days

Postoperative care was fraught with challenges—pain management, respiratory complications, and anastomotic strictures were common.

Among all complications, anastomotic leak was, and still is, the most distressing for any Oesophageal surgeon. Given the late presentation, poor nutrition, and lack of advanced evaluation, leak rates were high. We would go to the surgical ICU with methylene blue, administer it orally, and closely observe the intercostal and abdominal drains. The moment blue dye appeared in the tubes, it was a moment of profound sadness. Yet, it was this very experience that inspired me to master the art and craft of Oesophageal surgery.

Oncological clearance and lymph node dissection were not primary objectives in those advanced cases—the goal was simple and humane: to help the patient eat for whatever life remained.

Then and Now

Today, we practice in an era of well-defined oncological principles, superior imaging, advanced energy devices, excellent illumination, and refined anaesthesia and intensive care facilities with much better pain management principles and procedures. Blood loss and transfusion have become uncommon, staplers are routine, and optics have evolved into 3D, 4D, laparoscopic, and robotic platforms.

Having witnessed both ends of this spectrum, I can confidently say that this generation of surgeons is truly blessed. The rest—what we lived through—has now become history.

Passing the Torch

We transformed Calicut Medical College into a hub for learning, conducting national-level training programs that included lecture series and cadaveric demonstrations. It was a privilege to host pioneers like Dr. Patta Radhakrishna.

My dream in 1992 was to pursue perfection in Oesophageal surgery. I am proud to say that the dreaded complications of the past—anastomotic failures, strictures, and mortality—are now far and few between. Calicut Medical College has truly become a Center of Excellence.

I am content knowing the torch is now in the capable hands of my colleagues, Dr. Ajaykumar B, Dr. Arun S, and Dr. Priya Radhakrishnan. The future is bright.

Dr.Sreejayan.M.P
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Medical Superintendent
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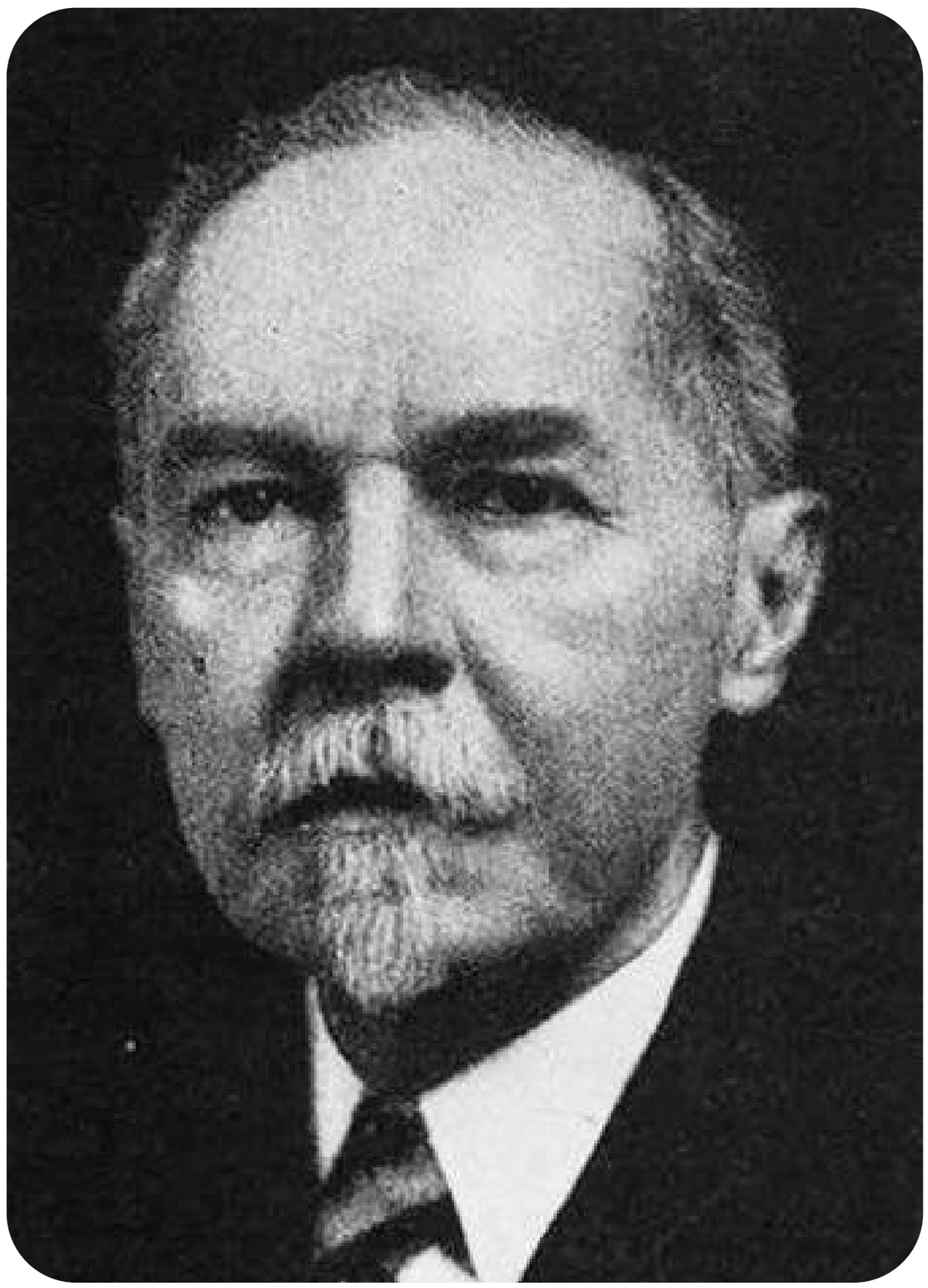
Top surgeons who transformed Oesophageal surgery

Franz John August Torek (1861–1938)



He was a pioneering thoracic surgeon whose audacious 1913 transthoracic esophagectomy marked the dawn of curative Oesophageal cancer surgery. Born in Breslau, Prussia (now Wrocław, Poland), to German immigrant parents, Torek crossed the Atlantic at age 11 and settled in New York City's teeming immigrant enclaves. A precocious scholar, he graduated from the College of the City of New York in 1880 and earned his MD from Columbia University's College of Physicians and Surgeons in 1887, during an era when surgery was rudimentary, infection was rampant, and thoracic access was taboo.

Torek honed his craft at German Hospital (now Lenox Hill), rising to attending surgeon by 1895. His early career spanned otolaryngology, cancer resection, and hernia repair, and he pioneered radical groin herniorrhaphy and hiatal hernia techniques. A meticulous anatomist, he championed precise dissection, publishing on thyroidectomy, breast cancer, and Oesophageal pathology. As the ninth president of the American Association for Thoracic Surgery (1927), he bridged eras, eulogized by colleague Carl Eggers as "one of America's great surgeons."

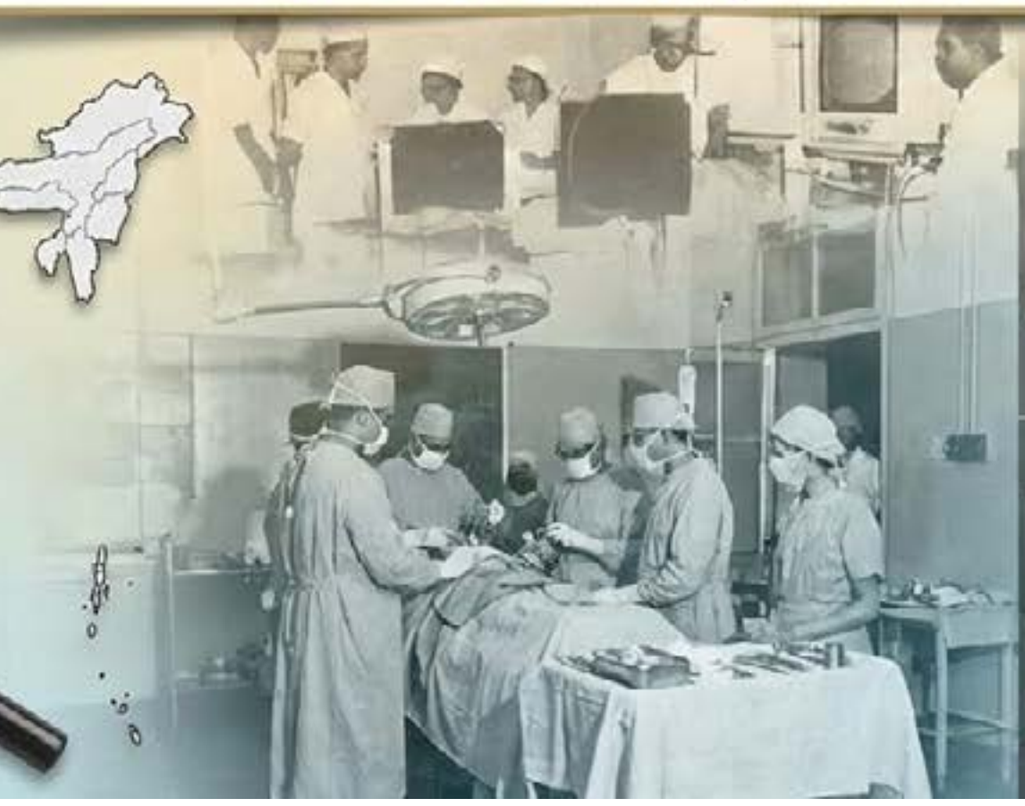
Torek's magnum opus unfolded on March 14, 1913: a 67-year-old woman with subaortic Oesophageal carcinoma. Facing 91% operative mortality, he executed the first successful intrathoracic esophagectomy via left thoracotomy. Under chloroform-ether anesthesia (administered by Eggers), using an innovative 18F endotracheal tube sutured to her edentulous lip, Torek resected 6 cm of esophagus, ligating vessels meticulously. Postoperative alimentation bridged a cervical esophagostomy to her pre-existing gastrostomy via extrathoracic rubber tubing. Defying odds, she survived 12 years—until pneumonia at 79—proving surgical curability and shattering pleural sanctity myths.

This feat, detailed in JAMA (1913, 1925 follow-ups), inspired global adoption, paving the way for Ivor Lewis (1946) and modern minimally invasive esophagectomies. Torek revisited 25 institutional cases (2 survivors), advocating skin-tube reconstruction, though his patient declined. Beyond the esophagus, he advanced pulmonary decortication and mediastinal tumors.

Retiring to Montclair, New Jersey, Torek enjoyed gardening until 1938, dying in Vienna at 77. Childless, his legacy endures in reduced esophagectomy mortalities (from 70% to <5% today). Torek embodied surgical valor: anatomical mastery, ethical rigor, and relentless innovation amid peril, transforming "inoperable" into operable and Oesophageal cancer from death sentence to survivable foe.

"The operation must serve the patient, not the ambition of the surgeon." - Franz Torek

EVOLUTION OF SURGICAL GASTROENTEROLOGY AT CHENNAI, INDIA



Evolution of Surgical Gastroenterology at Chennai, India.

Surgical disciplines were at their pinnacle in Chennai city in the latter half of the 20th century. Cardiothoracic surgery was started in Madras Medical College, Government. General Hospital Chennai, by Dr. C. Sadasivam. Many other departments, such as Neurosurgery, Plastic and Maxillofacial Surgery, and Urology, emerged as distinct disciplines. They stood as testimony to the concept that "specialization ensures the highest standard of care to the patient and nuanced training to the needy younger surgeons".

In this "pioneering institute of colonial legacy", the surgical procedures for GI diseases like GI malignancies, intricate liver pathologies, complex biliary strictures, ever prevalent pancreatic lesions, rare colonic inflammatory disorders, etc., needed, not mere surgical skills, but a deep understanding of their anatomical and pathological identity, precise and finespun decision making and orchestrating interdepartmental co-operation to provide optimal and meticulous care in this field. More focused expertise in this field of surgery was the need of the hour since most of these procedures were executed by an indistinct limb of general surgery. The need for a well-established specialisation, which is crucial not only for optimising patient outcomes but also for improving the quality of care, reducing complications, and advancing surgical knowledge, was very much felt.

Dr. Rathnasamy Arunachalam

Medical Gastroenterology, as a separate specialty, was formed in 1958 at the All India Institute of Medical Sciences, New Delhi. Prof. N. Madanagopalan from Madras Medical College created the medical Gastroenterology unit in 1965 and went on to start a DM super-speciality in gastroenterology in 1980. This specialty was flying in all colours during this period, fuelling the emotions of surgeons interested in this field to deliver.

It is in this period, the "formidable and dominant", " redoubtable" Professor. N. Rangabashyam, whose name is etched in the genealogy of Indian Surgical Education, is considered the "father of surgical Gastroenterology" and laid hold of the challenge, championing the creation

of a unique speciality, "Surgical Gastroenterology," as an essential cornerstone of digestive health. This was eminently possible for him, as his main interest was in Gastrointestinal surgery, right from day one of his surgical practice after returning to India.

Having understood the importance and benefits of specialization, and with special interest in surgery of the Gastrointestinal system, it is in Ward 10, acclaimed as "an Oasis in the desert", in Madras Medical College and the Government General Hospital, Chennai, India, first Surgical Gastroenterology speciality was conceived and brought into reality by Prof N. Rangabashyam. This remarkable feat was not merely an administrative formality but an essential necessity to bring out the best in the management of gastrointestinal diseases.

Renowned medical stalwarts from across the subcontinent, like Prof A.S. Fenn of CMC, Vellore, Dr. Arther Desa, Dr. Menda from Mumbai, Prof. A.K. Basu from West Bengal, and Prof. Chuttani from SGPGI, Chandigarh, rendered the most stimulating motivation and ambitious support in this unique venture of far-reaching outcome and transformed the dream of Prof. N. Rangabashyam into reality. To quote Eleanor Roosevelt, "the future belonged to those who believe in the beauty of their dreams". Prof. Rangabashyam, with prudence, believed in his dream and brought it to life, blossoming the lives of an infinite number of patients with surgical Gastroenterology problems and the surgical careers of the aspiring next generation of surgeons.

From the beginning, Prof. N. Rangabashyam focused on the surgical management of complex GI lesions. This towering personality, with excellent surgical skill and an aura of authority, exerted a gravitational pull in the surgical community, catalysing improvements in outcomes and propelling the department's stature and effectiveness. He thus positioned the surgical gastroenterology department strategically to achieve unprecedented success. His professional and intellectual strength, and the respect earned through excellence, defined the field's culture. Prof. Rangabashyam was ably assisted by equally proficient faculty, including Dr. Mohan Chellapa, Dr. Gnanaprakasam, Dr. Krishna Raj, Dr. Meyyappan, and Dr. Nadanasapapathy, who helped him build the unit with surgical mastery and academic brilliance.

The unit used to have routine combined ward rounds with the Medical Gastroenterology team, tumour board discussions with the oncology and radiotherapy teams, and combined GI Radiology and GI Pathology discussions to offer the best care to patients and to provide focused training to residents. The unit prioritized patients' trust and ethical practice, set high standards, and thus relentlessly improved under this globally recognised, visionary educator. This structured surgical Gastroenterology programme inspired many aspiring surgeons from across the country to seek training in the department and to share the professional skills they gained.

The department of Surgical Gastroenterology existed at Madras Medical College and the Government. General Hospital, offering specialized work in this field since 1975, but the "department of Surgical Gastroenterology and Proctology" officially came into existence in 1978 with a Government Order.

The unit was frequented from the inception by renowned, legendary visiting surgeons from across the world, who were overwhelmed to witness the vast and complex clinical material in this field, managed with strategic, advanced surgical procedures, during their visits. The residents had the exceptional opportunity to learn and assist them in surgery, too. To name a few who visited the department - Dr. Ellis, Sir. Ian Todd, Sir. McFarland, Dr. RCG Russell, Sir. Lockhort Mammary, Sir. John Dawson, Mr. Imrie, Sir.James Ross, Sir. James Fraser, Sir. Jeff Staney, Mr. McNair, Prof Chisholm, Prof. Owen Daniel, Prof Terblanche (South Africa), Prof. Moussa, Prof. Miles Gibson, Prof. Aluwihare, Prof. Raj Mohan Nambiyar, Prof. M.M.S. Krishnan, and others. Once, a group of 30 British oncologists visited the Government General Hospital and exchanged knowledge.

Complex GI surgical procedures including colorectal surgery (Anterior resection, Abdomino perineal resection, Total colectomy with pouch reconstruction) Pancreatic surgery (Whipples procedure, Distal pancreatectomy, Puestow's Pancreatico Jejunostomy,), hepatobiliary surgical procedures (Liver resections, biliary tumour and stricture surgeries) and complex multi visceral resections were routinely performed in the department in addition to emergency GI procedures with best results. Diagnostic Laparoscopy was performed along with the medical gastroenterology team.

These meticulously executed surgeries were sometimes multi-visceral resections with complex reconstructive techniques. Open exchange of ideas, clear communication, shared responsibility, recognition of dedicated hard work, and clear, precise guidance steered the unit to great success. Newer techniques were introduced over the years, and technological advancements were introduced without time delay. Staplers were used for bowel anastomosis, the first being the Russian staplers. Flexible Upper GI scopy and colonoscopy were introduced in the

early 80s, followed by video scopes. The ND YAG laser helped manage many intricate GI problems. Laparostomy with a zipper and timed re-explorations were introduced for fulminant abdominal sepsis with good results. Continent ileotomy and colonic pull-through were done, and pouch procedures were routinely performed. Surgical management of abdominal trauma, including liver and spleen trauma, bowel perforations, etc., was managed with exceptional expertise.

Ostomy, which remained a very unwelcome procedure for patients, gradually gained their confidence as its management improved. This was possible with improved and improvised management and proper counselling. And Ostomy management was refined with proper training of the ostomates by ostomy therapists. The Ostomy Association was later formed, and this also helped with patient counselling and improved the quality of life for ostomates. Newer ostomy appliances were introduced, further improving the ostomy care. Mrs. Saroja, who had ostomy speciality training at Tata Memorial Hospital, Mumbai, led this therapy unit in the surgical Gastroenterology department. The department is credited with starting the "Enterostomal therapy" diploma course to specifically train nursing personnel in the intricacies of ostomy management.

Residents were offered a structured training programme. They were trained, in addition to complex surgical procedures, in proper record-keeping, appropriate follow-up of operated patients, and documentation of surgical and clinical material with photographs, etc. All residents were encouraged to present scientific papers at the Surgical conferences routinely. Talent was sought after and finetuned. All were also trained in the management of GI emergencies.

The super specialty course in Surgical Gastroenterology (M.Ch. Surgical Gastroenterology) was started in 1985, almost a decade after the focus on GI surgical work, with approval from the University of Madras. This feat is unique as it is the first department to start such a speciality course in India, with no such speciality with this name being in existence. Thus, the foresight of this pioneering mentor reshaped how surgical gastroenterology was taught and practised across the continent.

Dr. R.P. Shanmugam and Dr. Srikumari Damodaran, who joined the course in December 1985, were distinguished as the first batch of residents of this unique course. The examiners for the first batch of the M.Ch course were Prof. N. Rangabashyam (Convener), Prof. T.E. Udwadia, Prof. B.M.L. Kapoor, and Prof Prakash Khandhuri. Prof. R.P. Shanmugam went on to etch his name in the surgical history by performing the first liver transplant in India.

This exceptional groundwork laid at this pioneering institute served as a template and benchmark to start similar training frameworks across the country. A similar course was started subsequently in many centres across the country, including Sanjay Gandhi Post Graduate Institute of Medical Sciences, Lucknow, All India Institute of Medical Sciences, New Delhi, and KEM Hospital, Mumbai, to name a few.

The M.Ch trainees trained in this department spread the doctrine of this specialisation across the country, establishing new departments and excelling one another in this field. While fanning out, they also introduced new techniques and refined their work as technology advanced. Minimal access surgery and robotic surgery have taken this field to a remarkable new era. Dr. Palanivelu, one of the department's prodigies, established himself as a world-renowned minimally invasive surgeon. Laparoscopic surgery, robotic surgery, and AI-assisted surgery are revolutionising this specialty in the current era.

Thus, this complex and intricate gastrointestinal system incarnated itself into a new philosophy, a specialty that provides diligent and evidence-based patient care by specialists with a mandate.

It is not surprising that the surgical gastroenterology specialty has paved the way for more organ-specific specializations, such as upper GI surgery, hepatobiliary surgery, and bariatric surgery.

The department of Surgical Gastroenterology was upgraded in 2014 to the "Institute of Surgical Gastroenterology".

Thus, the department's journey is underpinned by an unwavering commitment to skill and patient care through innovation and deep dedication.

Top surgeons who transformed Oesophageal surgery

Ivor Lewis (1895–1982)

The Welsh surgical titan, transformed Oesophageal cancer from a death sentence into a winnable battle through his eponymous two-stage esophagectomy. Born on October 27, 1895, in Llanddeusant, Carmarthenshire, as the only child of farmer Lewis Lewis and Mary Davies, Ivor grew up amid the rugged Welsh hills, fostering a resilience that defined his career. World War I interrupted his studies at University College Cardiff (1915–1918 preclinical), but he continued at University College Hospital London (1919–1921), earning an MB BS with the prestigious Lister Gold Medal in surgery.

Lewis's ascent began at Lewisham Hospital as resident surgical officer (1922–1930), securing London MD (1924) and MS (1930). A hard taskmaster—"demon for work," colleagues recalled—he demanded perfection from teams mirroring his own gruelling pace. At Plymouth City Hospital (1930–1933), as surgeon and medical director, he revolutionized visitor policies, allowing daily family access when rare, humanizing care amid the Great Depression's austerity. Returning to London's North Middlesex Hospital (1933–1951), Lewis built an international reputation in abdominal and thoracic surgery. In 1939, he performed Britain's first successful pulmonary embolectomy using Trendelenburg's technique, thereby cementing his boldness.

The 1940s crucible birthed his masterpiece. Amid WWII bomb shelters and rationing, Lewis tackled the inoperability of mid-thoracic Oesophageal carcinomas. Building on Franz Torek's 1913 transthoracic technique but rejecting the transhiatal approach, he developed a right transpleural approach. On January 10, 1946, his Hunterian Lecture at the Royal College of Surgeons unveiled it: Stage 1 laparotomy mobilizes the stomach via pyloroplasty; Stage 2 right thoracotomy resects the esophagus, pulls the stomach through the hiatus for intrathoracic esophagogastrostomy. Described in the British Journal of Surgery (1946), it prioritized immediate reconstruction, slashing leaks versus Torek's cervical esophagostomy. Initial skepticism among transhiatal purists yielded results: superior lymph node clearance and R0 margins for mid-esophagus cancers.litfl+1

Elected FRCS (1948), Lewis lectured across America and Europe, influencing luminaries. Humphrey Bogart's 1956 Ivor Lewis esophagectomy for Oesophageal cancer—performed by Mayo surgeons adopting the technique—underscored its global reach. In 1951, prioritizing Welsh education for his four children, Lewis relocated to Glan Clwyd Hospital, Rhyl, as a consultant surgeon until retirement. There, he mentored generations, embodying Welsh grit.

Lewis died in 1982, survived by wife, Nancy Faux. Posthumously honored: the Ivor Lewis Memorial Lecture (1983–) and Outpatient Building (2011) at Glan Clwyd. His procedure endures—now minimally invasive—accounting for 60% of esophagectomies worldwide, mortality plummeting from 30% to <3%. In an era without ventilators or antibiotics, Lewis's precision, two-field access, and gastric pull-up redefined Oesophageal surgery, saving countless lives and etching Welsh genius into thoracic history.

"The success of Oesophageal surgery lies as much in judgment as in technique." - Ivor Lewis

Timing of Definitive Surgical Therapy for Chronic Corrosive Induced Oesophageal Strictures – Why does it matter?

Introduction

Corrosive induced Oesophageal injuries and consequent stricture formation are not uncommon in India, due to the ease of availability and access to corrosives, both alkalis and acids. Both suicidal and accidental injuries are seen in practice with lye and bathroom cleaning acid (hydrochloric acid) being common offenders.

There is no controversy regarding the role of surgery and timing of surgical intervention for acute caustic injuries severe enough to warrant emergency surgery. Transmural injuries with overt or incipient perforation call for emergency intervention to avoid or limit adjacent organ damage. In a series of acute corrosive injuries subjected to surgery, the best results were obtained when the procedure was done within 24 hours of injury (1).

A large majority of the number of corrosive injuries of the esophagus, however, are not transmural and go on to healing with fibrosis and consequent stricture formation either of the stomach or the esophagus or both. It is well known that alkalis due to the viscous adhesive nature, are more likely to injure the esophagus and acids which are rapidly cleared from the esophagus are more likely to injure the stomach particularly the prepyloric region due to corrosive induced pylorospasm and consequent pooling of acid in the prepyloric region. In acute deep injuries, progressing towards narrowing, dilatation is best started with care about 3-4 weeks after injury for the edema and friability of the esophagus to settle down. This is supported by the fact that scar retraction in corrosive injuries begins by the third week and continues for months (2).

Management of Chronic injuries

Management of chronic corrosive induced strictures is a challenging surgical problem. Considering that surgery in these patients is a major intervention, dilatation continues to be the first choice in management, should patients be suitable for dilatation. However, corrosive induced strictures, as compared to other benign strictures such as peptic strictures, tend to be denser, multiple, longer and often have the lumen of the esophagus completely obliterated, thus eliminating the chance of passage of a guide wire and dilatation either with a balloon or with Savary–Gillard dilators. Also, the progressive nature of fibrosis during the healing process may require dilatation for several months at regular intervals before stabilization of the lumen.

The success of dilatation has been defined by Broor et al as adequate if a lumen of 15 mm. could be achieved by dilatation and maintained at that level after five dilatations and there was complete relief of dysphagia (3). They studied long term success rate after dilatation of corrosive strictures versus peptic strictures of the esophagus and found that recurrence was significantly more in the corrosive group (3). At twelve months, however, the recurrence rate stabilized showing the effect of continuing fibrotic healing on the dilatation success.

Another study confirmed the fact, that in anastomotic strictures after previous surgery in 142 patients of whom 124 underwent dilatation, that clinical success was achieved in 113 (91.3%) patients requiring a median [Interquartile range (IQR)] of 4 (2-10) sessions (4). The number of dilations to achieve clinical success, refractory strictures, and recurrent strictures, and the use of adjunctive therapy were significantly higher for corrosive strictures than for non-corrosive strictures (4).

Current literature suggests, although figures are variable in different series, that about a third of the patients or more, would be unsuitable for initial dilatation or be refractory and resistant to continued luminal patency, even after 6 months of more of dilation. This is due to the very nature of corrosive induced strictures of the esophagus which has been mentioned earlier. These, will require surgical intervention. Optimal timing of surgery for Oesophageal replacement is critical to avoid anastomotic strictures

which compromises quality of life.

Whether or not, the patients are treated initially by dilatation or surgery for chronic strictures, nutritional management is of critical importance since these patients are unable to feed satisfactorily. This, however, should not influence hasty timing of surgery for feeding purposes. It is mandatory in all these patients to establish a feeding jejunostomy to rebuild their nutritional status and maintain them till definitive procedure is done.

For this purpose, a gastrostomy is not advisable since it will interfere with the possibility of a future gastric pullup and compromise the length of the gastric conduit. Besides, many of these patients will have concurrent gastric injury precluding gastrostomy anyway for feeding purposes or have subclinical injury progressing to gastric outlet obstruction later thus making a gastric feeding tube dysfunctional. Since, symptomatically a gastric injury by corrosives presents earlier with vomiting, than a concurrent corrosive injury of the esophagus with dysphagia, many of these patients have had an earlier gastroenterostomy for the gastric outlet obstruction thus precluding future use of the stomach as a conduit.

Timing of definitive surgery for chronic corrosive Oesophageal strictures

One of the most important considerations in the surgical management of corrosive Oesophageal strictures is the timing of surgery from the time of injury. This applies to both resection of the esophagus and replacement with a conduit or bypass of the esophagus without resection using a conduit either stomach or colon. Healing after corrosive injury is by fibrosis which progresses for an undefined and variable period in different individuals.

The scientific basis for timing of Oesophageal replacement is based on the seminal work of Bassouiny et al. (5). Bassiouny et al, found in rats, that collagen deposition peaked during the second week after injury but continued for a long time after corrosive injury of esophagus. Scar retraction began as early as the end of the second week, and lasted for about six months at the least. It took about 6-12 months before ongoing fibrosis ceased after injury and the process stabilised. Hence, earlier anastomosis might result in anastomosing to an esophagus which is still in the process of healing by fibrosis, thus affecting anastomotic lumen. A too early operation, therefore, when the scar has not completely formed, may promote the risk of anastomotic stenosis. In Bassouiny's own patients, 2 out of three patients operated by about three months after injury developed stenosis (67%) while only one only of 65 (1.5%) operated after 6 months did so (5).

Very few papers in literature have reported on the success of Oesophageal replacement with a conduit in corrosive Oesophageal disease, as related to timing of surgery. Gupta and Gupta in their paper have mentioned that the interval between corrosive injury was less than 6 months is 19.6% of their patients, 6-12 months in 47%, 1-2 years in 21.6%, 3-5 years in 5.9% and more than five years in 1.9%. None of their patients were operated in less than 6 months after injury. Although anastomotic stricture rate was 63.6% in colonic conduits and 57.5% in gastric conduits in their series, all patients improved after a few sittings of endoscopic dilatation (6). This shows that the stricture was probably conduit related and not due to ongoing fibrosis.

Understanding the pathophysiology of corrosive injury is important in planning definitive management. It must be emphasised that scar retraction begins as early as the end of the second week and lasts for 6 months. Six to twelve months is considered the average time before full fibrosis is achieved after the injury [7]. It has been mentioned that esophagectomy carried out too early prior to the scar tissue maturation might increase the risk of anastomotic stenosis [8]. Han et al advocate delaying major reconstructive surgery in patients with caustic burns for at least 6 months from the time of injury provided that emergency surgery is not indicated[8].

Delayed fibrosis after Oesophageal bypass may present in bizarre ways other than dysphagia. In the author's own experience of over 500 patients with caustic Oesophageal injuries seen over a period 48 years, a patient who had a subcutaneous colonic conduit, due to mediastinal fibrosis preventing an intra-thoracic route, presented with massive dilatation of the conduit a year after surgery. Endoscopic examination indicated that while the conduit was patent, delayed gastric obstruction occurring more than a year after ingestion had caused functional obstruction

of the stomach leading to progressive dilatation of the conduit. A gastric bypass resolved the issue with the colon returning to normal size (9).

Other factors affecting conduit patency and leading to stricture formation.

There are several other factors affecting results in patients who undergo Oesophageal replacement. These are anastomotic tension due to shortness of the conduit, impaired vascular supply of the conduit by the very nature of its blood supply often dependent on a single vessel, anastomotic leak promoting healing by fibrosis and surgical technique such as stapled versus hand sewn, single versus two-layer anastomosis etc. These however, are beyond the scope of this article.

However, it must be stated that when the stomach is used as the conduit (provided it is not also involved by the corrosive injury), the blood supply is more reliable, the number of anastomosis is only one (between the proximal stomach and the esophagus) compared to colon where anastomosis involves both the upper and lower end of the conduit. However, reflux of gastric contents into the proximal esophagus may promote stricture formation. Reported stricture rates of gastric conduits are relatively lower than colonic conduits though most published results do not mention the timing of replacement which is the theme of this article.

Colonic conduits are used when the length required is longer than available stomach, the stomach itself is involved by corrosive injury or has been compromised by a previous gastroenterostomy for stricture induced gastric outlet obstruction. Colonic conduits suffer from tension at the proximal anastomosis site especially when the right colon is used. They require two anastomosis and the long segment based on a single pedicle can result in tension at the proximal anastomosis. All contribute to a greater post-operative stricture formation.

The point of this paper, is not to focus on which conduit is superior but to emphasis that whichever conduit is used, the timing of the surgery is important to allow for fibrosis during the healing process stabilize, so that it does not affect postoperative patency at the site of the anastomosis.

Conclusion

In conclusion, it can be said that the decision when to operate and substitute the esophagus with a conduit with or without removal of the native esophagus injured by corrosive, is critical to long term outcome. It has been well proved in experimental studies that the fibrosis of healing in caustic injury progresses up to six months at least before becoming stabilized. Earlier repair at the request of the patient, to enable them to swallow earlier, is likely to result in a greater incidence of stenosis. Unfortunately, only few studies are available which report stricture rates after surgery and relate it to the time of definitive intervention. However, the few that are available show superiority of waiting for over six months minimum, to reduce the chance of anastomotic stricture due to progressive fibrosis. Nutritional consideration, can be taken care of by providing for a feeding jejunostomy during this process. A feeding gastrostomy compromises the stomach as a conduit because of fixation to the anterior abdominal wall. Adequate length, lack of tension at the anastomosis and adequate vascularity of the conduit are important considerations. Airway management in corrosive injuries is beyond the scope of this article.

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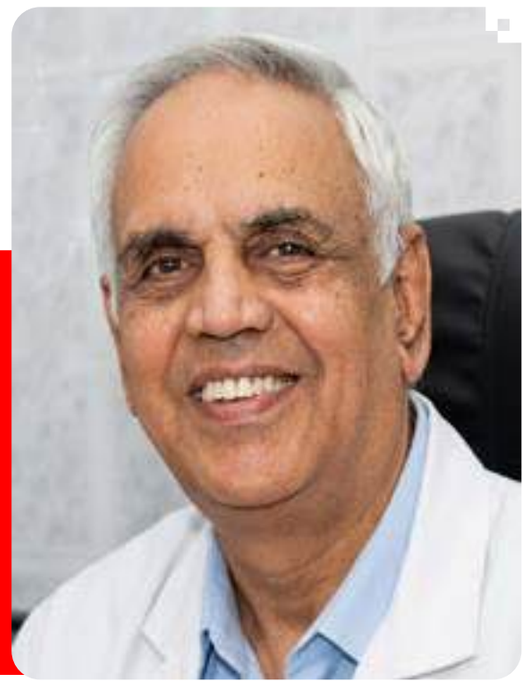

Top surgeons who transformed Oesophageal surgery

Richard H. Sweet (1901–1961)

The Boston thoracic virtuoso, redefined Oesophageal cancer surgery with his lightning-fast left thoracoabdominal esophagogastrectomy, halving operative times and mortality in an era of perilous thoracic ventures. Born into privilege in 1901, Sweet's Ivy League trajectory—AB from Harvard (1922), MD (1926)—led to surgical residency under the legendary Edward Churchill at Massachusetts General Hospital (MGH). Trained amid the 1930s thoracic revolution sparked by Franz Torek's 1913 transthoracic esophagectomy, Sweet rejected Torek's radial diaphragmatic incision, which crippled respiration, and transhiatal limits that sacrificed margins.

Sweet's genius bloomed at MGH (1938–1961), where he pioneered pulmonary and Oesophageal feats. His 1945 innovation—esophagogastrectomy via a single left thoracotomy—mobilized the stomach by dividing the left/short gastric arteries, thereby extending the reach to the aortic arch via the Kocher manoeuvre. Published in Annals of Surgery (1945), it enabled immediate intrathoracic esophagogastrostomy, reducing anastomotic leaks compared with cervical routes. Churchill dubbed him "Master among Masters"; peers marvelled at his <2-hour speed—half that of contemporaries—rooted in razor-sharp anatomy and flawless technique. By the 1950s, Sweet's procedure had demonstrated superior mid- and distal Oesophageal clearance, thereby influencing global standards.

A general surgery polymath, Sweet excelled in pulmonary decortication, tracheal resection, and hiatal hernia repairs, amassing 500+ esophagectomies. Elected AATS president (1961), his Hunterian-like precision embodied mid-century bravado: no antibiotics, rudimentary anesthesia, yet operative mortality plunged from 30% to 10-15%. Winston Churchill reportedly lauded his wartime consultations.

Sweet's legacy endures in China (Zhongshan Hospital's 784-case series) and minimally invasive variants, though Ivor Lewis's right thoracotomy supplanted it for proximal lesions due to better lymphadenectomy. Yet Sweet's left approach is particularly effective for distal tumors, minimizing morbidity.

Tragically, on January 11, 1961—weeks before AATS presidency—Sweet died suddenly at 59, likely of coronary disease, survived by wife and children. Eulogized as "unspectacular" yet unmatched, his eponymous procedure symbolizes surgical elegance: speed without sacrifice, access without excess. In resource-strapped India, Sweet's efficiency resonates for high-volume units, bridging Torek's audacity to modern MIE. Sweet didn't just cut; he conquered the esophagus, proving mastery lies in economy of motion and mastery of peril.

"The operation begins long before the incision." - Richard H Sweet

Author Perspective – Lessons Learnt from A Thousand Minimal Access Esophagectomies

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Lesson 1 - Esophagectomy is a test of a healthcare system:

Esophagectomy is not just another gastrointestinal operation. It tests the limits of the patient, the surgeon, and the system in which it is performed. When we began our journey with minimally invasive esophagectomy (MIE), the intention was not to accumulate numbers, but to make this formidable operation safer, more reproducible, and kinder to patients. The path was demanding and required patience, endurance, and repeated self-correction. Our journey of over 1000 consecutive minimally invasive esophagectomies reflects not just a change in technique, but a fundamental transformation in training, teamwork, perioperative care, and surgical philosophy.

Lesson 2 – Thoracotomy has a very limited role in modern esophagectomy:

In the early days, thoracotomy was often considered an acceptable response when difficulty arose. With experience, we realized that in contemporary esophagectomy, thoracotomy rarely improves access or vision and has to be performed only when considered life-saving. Conversion should never be elective or for convenience. Avoiding thoracotomy became a principle rather than a goal, compelling us to plan better, improve our instrumentation skills, and be consistent in execution.

Lesson 3 – Standardization is the foundation of safety:

As the surgical team expanded, it became evident that outcomes improved not because of individual brilliance, but because of uniformity. We adopted standardized steps and adhered to them in as many situations as possible. Simplified management algorithms replaced complex decision trees. When every member of the team knows what comes next, variability is reduced and safety is improved. Complex problems demand simple, well-rehearsed algorithms—not improvisation.

Lesson 4 – Milestone based training works best:

One of the earliest lessons we learned was that mastery of esophagectomy cannot rely on opportunistic learning. We adopted milestone-based training for residents, breaking the operation into defined, reproducible steps. Residents progress from observation to assistance and then to independent execution of specific components, ensuring structured skill acquisition rather than variable exposure. The success of this approach is gauged by the alumni of this department who have successfully

started esophagectomy programs in various parts of the country.

Lesson 5 - Systematic video cataloguing and review must become a habit:

Routine video recording and structured review became integral to our program. Reviewing operative videos—both successes and complications—helped identify errors, refine technique, and shorten learning curves. This collective learning reduces inter-surgeon variation and strengthens the surgical culture.

Lesson 6 - Technology may change, Surgical Principles must endure:

During our journey, technology has evolved from single-chip cameras to 3D imaging to 4K platforms, and now robotic systems. While these advances improved visualization and ergonomics, the fundamental objective remained unchanged: to perform a safe esophagectomy while avoiding thoracotomy whenever possible. Technology serves the surgeon; it never guides the operation.

Lesson 7 - From Individual Ownership to Shared Responsibility:

Perhaps the most significant shift was moving away from the notion that the surgeon who starts the operation must finish it. Esophagectomy is long, complex, and physically demanding surgery. We adopted the "assembly-line" approach, where surgeons of equal competence take charge of different stages. This reduces fatigue, prevents burnout, and improves consistency—because no surgeon should rush through a critical step, and every step in esophagectomy is critical.

Lesson 8 - The Operation Is Only Half the Treatment:

Technical success alone does not determine outcomes. True progress occurrs only when perioperative care becomes multidisciplinary. Respiratory therapists, prehabilitation teams, dieticians, anesthesiologists, pain and palliative care specialists, nurses, physiotherapists, and surgeons must work in continuity. No amount of postoperative care should feel excessive. Esophagectomy demands generosity of care.

Lesson 9 - Prehabilitation is a duty of the surgeon:

We have learned, probably later than we could have, that prehabilitation is the prerogative of the surgeon within an MDT. Many patients experience symptomatic relief after neoadjuvant therapy and drift away from surgical follow-up. Despite operating on over 1000 patients, we estimate that nearly 400 potentially operable patients were lost to attrition or defaulted after neoadjuvant treatment. Maintaining continuous engagement with patients during this phase is essential to ensure completion of curative-intent therapy. Prehabilitation and follow-up must remain the surgeon's responsibility within the multidisciplinary team.

Lesson 10 - Planning Ahead:

The future of Oesophageal cancer surgery is filled with both challenges and hope. Increasing patient complexity, integration of robotic platforms, evolving systemic therapies, and workforce fatigue will test existing models. Our experience reinforces that success lies not in heroic individual effort, but in structured training, standardized techniques, disciplined teamwork, and uncompromising perioperative care.

What a Thousand Patients Taught Us:

A thousand esophagectomies did not make us fearless; they made us careful and deliberate. They taught us that excellence is built quietly—case after case—through humility, repetition, and teamwork. This path is demanding, but it is honest. And it works!

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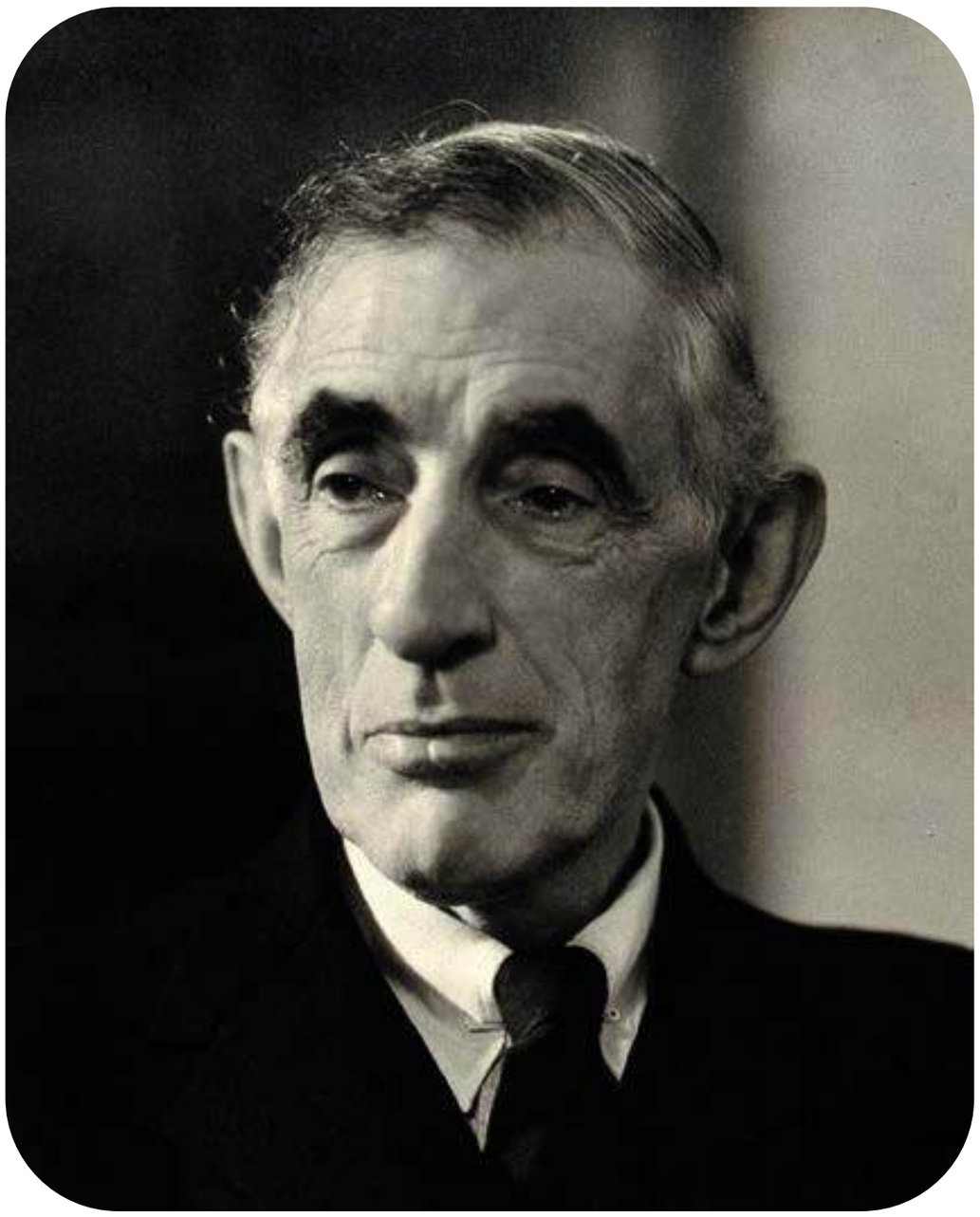
Top surgeons who transformed Oesophageal surgery

George Grey Turner (1877–1951)



He was a prominent British surgeon best remembered for identifying Grey Turner's sign, a clinical indicator of retroperitoneal hemorrhage most often associated with severe acute pancreatitis. Born in Northumberland, England, he was educated during a transformative period in medical history, when antiseptic practices were becoming established and abdominal surgery was advancing despite significant risk. He studied medicine at the University of Durham College of Medicine in Newcastle upon Tyne and qualified at the turn of the twentieth century, entering a profession that relied heavily on clinical judgment and anatomical expertise. Turner dedicated most of his career to the Royal Victoria Infirmary in Newcastle, where he rose to become Professor of Surgery. Known for his calm demeanor and disciplined approach, he emphasized precise anatomical dissection and careful operative planning. His work reflected a generation of surgeons who valued observation and methodical reasoning at a time when diagnostic tools were limited. In 1920, Turner published a report describing discoloration of the flanks in a patient with acute pancreatitis. He recognized that this bluish ecchymosis resulted from retroperitoneal bleeding tracking along fascial planes to the skin. This observation became known as Grey Turner's sign and provided clinicians with a visible marker of severe intra-abdominal pathology. In an era without imaging technologies such as CT scanning or advanced laboratory testing, such physical signs were critical for diagnosis and prognosis. The identification of this sign reinforced the importance of thorough physical examination and clinicopathologic correlation. During the First World War, Turner served in the Royal Army Medical Corps, gaining experience in trauma surgery and the management of complex wounds. The demands of wartime medicine deepened his understanding of hemorrhage, infection, and systemic shock. These experiences informed his later surgical philosophy, which favored early recognition and decisive management of abdominal emergencies while maintaining respect for anatomical structures. Beyond his eponymous sign, Turner contributed to developments in abdominal surgery, including treatment approaches for biliary disease, peptic ulcer complications, and traumatic injuries. He was also a dedicated educator who trained numerous surgeons, insisting that technical skill be grounded in a solid understanding of anatomy and pathology. His teaching emphasized disciplined observation, careful documentation, and thoughtful clinical decision-making. Knighted in recognition of his services to surgery and medical education, Turner became a respected figure in British medicine between the world wars. Even as surgical techniques and diagnostic technologies evolved, his legacy endured through continued reference to Grey Turner's sign in textbooks and clinical training worldwide. George Grey Turner represented a bridge between traditional bedside medicine and the emerging scientific era of surgery. His careful observation transformed a subtle physical finding into a lasting diagnostic tool, demonstrating that attentive clinical examination could reveal life-threatening internal disease. Through his surgical practice, military service, and commitment to education, Turner left a durable imprint on the history of abdominal surgery and clinical medicine.

"Restraint is as much a surgical virtue as boldness." George Grey Turner

A Mentor for a Lifetime

A Tribute to Prof. S.M. Chandramohan

The world of surgery recognizes Professor S.M. Chandramohan as the visionary founder of the Institute of Surgical Gastroenterology at Madras Medical College and a world-renowned Oesophageal Surgeon. But for those of us who had the privilege of standing across the operating table from him, he was much more. To me, he was a mentor, a teacher, a friend, and the most significant guiding force of my professional existence.

Our journey began in 2000. I still vividly remember the first time I watched him perform a transhiatal esophagectomy. To witness his hands navigate the complex anatomy of the mediastinum was to watch a masterclass in precision. Under his watchful eye, I learned my first total esophagectomy—a milestone that defined my career path.

My frequent trips from Calicut to Madras were never just for clinical observation. They were intense learning sessions where he generously shared the subtleties of surgical craft that books could never teach.

Prof. Chandramohan's influence was never confined by geography. He was a man of immense international stature, connected to every world-renowned authority in Oesophageal surgery. Yet, he used that influence entirely for the benefit of his students. He was the wind beneath my wings, facilitating my international training in Hong Kong, Japan, and America. He didn't just teach me how to operate; he taught me how to lead, placing me on faculty in national and international forums and constantly creating opportunities for me to "climb the ladder" in our specialty.

Beyond the surgical masks and the high-stakes environment of the operating rooms, Dr. SM was a man of deep principles and boundless affection. He was a Caring Guardian. He looked after his students' careers with parental devotion and promoted research activities among undergraduates, postgraduates, and colleagues. He is always a positive force. No matter the surgical challenge, his presence was a reassuring, positive light even remotely.

His sudden demise has created a vacuum that is, quite frankly, impossible to fill. His truest legacy lives on in the hands of the surgeons he trained and the lives of the patients we now save using the techniques he perfected.

Sir, you were the guiding force that shaped my life. While the surgical community has lost a giant, I have lost my greatest well-wisher. We will continue to operate, teach, and research in your honour, carrying forward the torch you lit.

Dr.Sreejayan.M.P
Dip.NB., Ph.D., FRCS (Edin), FRCS (Glasg)
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Top surgeons who transformed Oesophageal surgery

Mark B. Orringer, MD
Pioneer of Oesophageal Surgery

Early Life and Education

Mark B. Orringer was born into an era when thoracic surgery was still finding its footing as a discipline, and his life's work would do much to define it. He completed his undergraduate education at the University of Pittsburgh, graduating Phi Beta Kappa in 1963 — a distinction that foreshadowed the intellectual rigor he would bring to surgery. He went on to earn his medical degree from the University of Pittsburgh School of Medicine in 1967, graduating Alpha Omega Alpha, the highest academic honor in American medical education.

His postgraduate training took him to one of the most prestigious institutions in the world: The Johns Hopkins Hospital in Baltimore, where he completed both his general surgery and thoracic surgery residencies by 1973. A pivotal chapter of that training was a fellowship at Frenchay Hospital in Bristol, England, under the mentorship of Ronald Belsey — one of the twentieth century's most celebrated Oesophageal surgeons. Belsey's influence proved formative, instilling in Orringer both a fascination with Oesophageal disease and a commitment to refining surgical technique to minimize patient suffering.

A Career at Michigan

In 1973, Orringer joined the faculty of the Section of Thoracic Surgery at the University of Michigan as an Assistant Professor. His ascent was rapid: promoted to Associate Professor in 1976 and to full Professor in 1980, he became Head of the Section of Thoracic Surgery in 1985, a position he held with distinction until 2011. He was appointed the John Alexander Distinguished Professor of Thoracic Surgery in 1997, later receiving the title of Cameron Haight Distinguished University Professor — the highest professorial recognition the University of Michigan can bestow. During his tenure, he also served as Thoracic Surgery Residency Program Director for 21 years.

The Transhiatal Esophagectomy: A Surgical Revolution

Orringer's defining contribution to medicine is the popularization and refinement of the transhiatal esophagectomy (THE) — a technique for removing the esophagus without opening the chest. He rediscovered and began developing this approach in 1976, presenting it to the American Association for Thoracic Surgery in 1978, where it was met with considerable skepticism from the surgical establishment. The traditional transthoracic esophagectomy — which required opening the chest — carried operative mortality rates as high as 20 percent. The transhiatal approach, which avoids the thoracic cavity entirely and places the anastomosis (surgical connection) in the neck where any leak can be safely drained, fundamentally changed this calculus.

Under Orringer's leadership, the University of Michigan performed more than 3,000 transhiatal esophagectomies, achieving a 30-day operative mortality rate of approximately 1 percent — a transformation that was nothing short of extraordinary. Comparative data with the Society of Thoracic Surgeons National Database confirmed that Michigan's outcomes were substantially superior in survival, complication rates, and length of hospital stay. His landmark series of cases remains among the largest ever reported by a single institution under a single technique.

Additional Surgical Innovations

Beyond the transhiatal esophagectomy, Orringer developed the combined Collis-Nissen hiatal hernia repair, which addressed the challenging

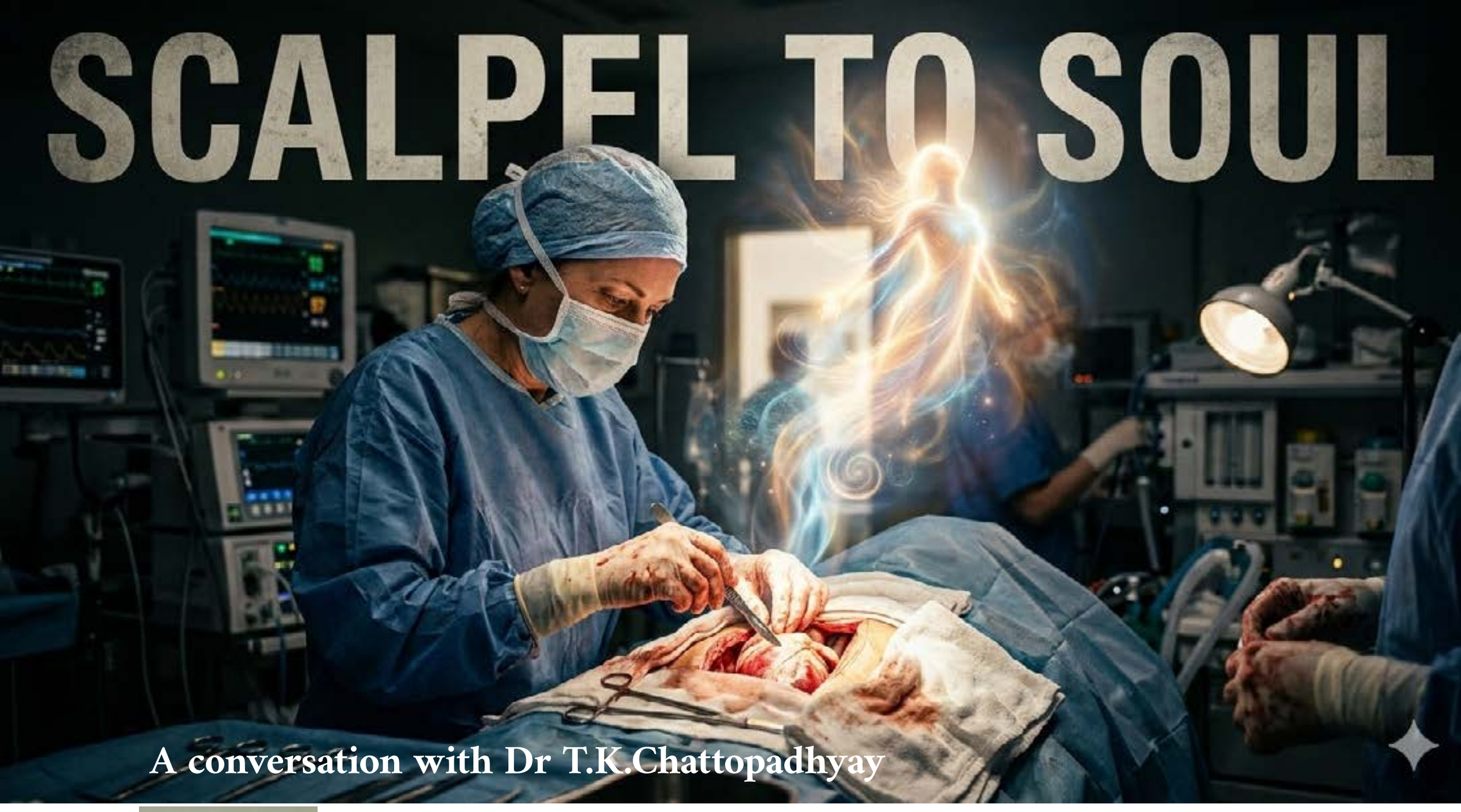
problem of gastrOesophageal reflux in patients with shortened esophagi. His clinical research spanned the full breadth of Oesophageal disease — cancer, achalasia, diverticula, strictures, and reflux — as well as thoracic oncology, lung transplantation, and lung volume reduction surgery. He also contributed meaningfully to the development of simulation tools for training surgeons in the cervical esophagogastric anastomosis, helping ensure that the technical excellence he built at Michigan could be transmitted to the next generation.

Scholarship, Leadership, and Legacy

Orringer's academic output has been prodigious: more than 260 peer-reviewed journal articles, 110 book chapters, and six edited books. He served on the editorial boards of multiple leading journals and has delivered invited lectures and visiting professorships across the globe. His national leadership has been equally distinguished — he served as President of both the Society of Thoracic Surgeons (2001) and the Thoracic Surgery Directors Association, and as a Director of the American Board of Thoracic Surgery from 1988 to 1995. He received the Society of Thoracic Surgeons Distinguished Service Award and was inducted into the Johns Hopkins University Society of Scholars.

Mark B. Orringer's legacy is not simply that of a skilled surgeon, but of a reformer who challenged an entrenched orthodoxy and, through meticulous evidence and thousands of carefully documented outcomes, proved that a safer path existed for patients facing one of surgery's most daunting procedures. He transformed Oesophageal surgery from a discipline defined by high mortality into one where survival is expected and recovery is the rule. In doing so, he gave back quality of life to thousands of patients — and gave the specialty itself a new standard to aspire to.

SCALPEL TO SOUL



A conversation with Dr T.K.Chattopadhyay

Dr. Tushar Kanti Chattopadhyay has been at the forefront of Surgical Gastroenterology in India for over four decades, shaping not just the practice of complex upper GI and Oesophageal surgery but also the training of generations of surgeons. As Head the Department of GI Surgery at AIIMS New Delhi, he played a pivotal role during the formative years of the specialty in the country. After superannuation from AIIMS, he continued his clinical and academic engagement at ILBS, New Delhi, extending his influence into HPB surgery and transplant care. Beyond his clinical work, Dr. Chattopadhyay has been an influential academic voice, most notably as long-standing Editor-in-Chief of the GI Surgery Annual series, helping define practice standards and disseminate surgical knowledge across India. In this interview, he reflects on his journey, the evolution of Oesophageal surgery, and the values he hopes future surgeons will carry forward.

Gayatri Balachandran (GB): Your career has spanned the formative years of Surgical Gastroenterology in India. Can you elaborate on your journey? What drew you to this specialty, and how did your professional interests evolve over time?

TK Chattopadhyay (TKC) : Let me clarify in the beginning itself that I am not a trained GI Surgeon I am, by training, a general surgeon. I completed my MS in General Surgery at AIIMS, New Delhi in 1976, followed by Senior Residency from 1977 to 1979. I joined the AIIMS faculty in 1979 through an all-India selection. During my early faculty years, I developed strong interest in conditions that today fall under GI Surgery, such as portal hypertension, corrosive strictures, Oesophageal malignancies, inflammatory bowel disease, intestinal cancers, and hepatobiliary and pancreatic disorders. At that time, however, the sheer clinical load in General Surgery made it difficult to formally pursue these interests within a separate unit.

A major milestone came in 1985, when AIIMS created a dedicated Department of GI Surgery under Prof. S. Nundy. A few years later, during ASICON in Chennai in 1989, the Indian Association of Surgical Gastroenterology (IASG) was formed, with Prof. BML Kapoor as its President and myself as Treasurer (minus the treasure, of course!) When Prof. Nundy superannuated in 1996, the Director asked me to head both General Surgery and GI Surgery. Encouraged by Prof. Rakesh Tandon (Head of Gastroenterology), I was subsequently posted permanently as Head of GI Surgery, a position I held until my retirement in 2011.

GB : Having worked extensively in public-sector institutions, how did that environment shape your surgical judgment, priorities, and academic outlook?

TKC : I have worked all my life in AIIMS, Delhi- a public sector organization. It provided the best possible environment to pursue a specialized surgical career. AIIMS stands on three pillars: patient care, teaching, and research, and there was no interference with these core

goals. Guided by the ethos pursued by our predecessors , patient care was always the highest priority. We encouraged our students to inculcate a humane approach and treat their patients with empathy and compassion. The academic culture of institution provided mentorship, and created avenues for learning of the highest quality. Students were encouraged to actively ask questions, and were assessed for core competence and understanding. In AIIMS we introduced Objectively structured clinical examination (OSCE) or Objectively structured practical examinations (OSPE). We encourage students to pursue research projects of their choice, , and actively supported them through supervision, periodic review, and eventually publication.

Looking back, the institution shaped not only my own development but also that of multiple generations of surgeons who trained there.

GB : Oesophageal surgery is considered one of the most demanding areas within Surgical Gastroenterology. What made you choose this area of interest?

TKC : My interest in Oesophageal surgery did not arise from technical fascination. It was due to shear sense of empathy towards a fellow human being unable to swallow his own saliva – an extremely distressing scene to observe. During my early residency, I vividly remember an elderly man in the OPD corridor, emaciated and repeatedly spitting and regurgitating into a glass held by his wife. I helped him to my room and made a diagnosis of Oesophageal cancer. I was told to admit the patient for gastrostomy, which I did so against my own better judgement. He underwent the procedure, which provided nutrition but did not relieve his humiliating symptom. The episode has haunted me ever since.

When I later became faculty, I decided to take up this challenge wherever feasible. We admitted such patients, built them up nutritionally through enteral or parenteral means, re-evaluated fitness, and offered surgery with proper counselling regarding risks, prognosis, and mortality. Those who were unfit for major surgery were offered palliation through dilation, stenting, radiotherapy, or bypass, and always with full explanation of intent.

This is how I entered the field of Oesophageal surgery, not by deliberate choice, but out of a desire to alleviate suffering.

GB : You carry with you experience from more than 1000 Oesophageal surgeries. What are the most important learning points you have gained through this vast experience?

TKC: I would emphasise on the importance of applied anatomy, physiology, and radiology of the oesophagus. To pursue a career in Oesophageal surgery one should be comfortable not just with operative anatomy, but with all aspects of radiology - Ba-swallow, CT, MRI,PET CT, as well as endoscopy. In my view, it is safer to begin with a barium swallow, which provides a “road map” before the endoscope is introduced.

Understanding the pathophysiology of motility disorders such as strictures, Barrett’s oesophagus and achalasia is essential to meaningful decision-making. Oesophageal patients frequently present with comorbidities, especially aspiration pneumonia, which must be factored into preoperative evaluation and optimization. For therapeutic decision making, it is important to have fair understanding of the pathology of the diseases of the oesophagus as well.

GB : Over the decades, what major changes have you observed in the

presentation and management of Oesophageal diseases in India?

TKC: Major changes happened in the management of Oesophageal cancer. For decades, Oesophageal resection remained the gold standard for treatment. Mid-thoracic tumors were approached through a thoracotomy with procedures such as the Ivor Lewis or McKeown operations. With greater experience, we moved away from opening the chest and adopted transhiatal esophagectomy, which worked well for our patient population. We were very happy with the results and continued this till the last day of my service at AIIMS.

We made several more changes in our protocol including the introduction of preoperative short course radiotherapy, following our observations that primary Oesophageal resection is often difficult due to extraOesophageal extent of disease. In some patients, we observed complete pathological response, which encouraged us to adopt primary chemoradiotherapy with surgery reserved for local recurrence. The availability of PET-CT further changed management by avoiding surgery in patients with previously undetected distant metastases.

GB : You have trained several generations of GI surgeons. What do you see as the key strengths and gaps in current Surgical Gastroenterology training in India?

TKC : In AIIMS, we ensured that every resident was given first-hand exposure to the full spectrum of Oesophageal diseases: malignancies, strictures (including corrosive), motility disorders, reflux disease, and achalasia. By the time they completed training, most of our residents could manage these conditions surgically.

GB : You have witnessed the transition from open to minimally invasive and robotic GI surgery. Where do you see the true value of minimally invasive approaches, particularly in Oesophageal surgery?

TKC: Minimally invasive surgery has truly transformed surgical practice. There are obvious benefits - surgery with clarity or vision and precision of movement, and smaller incisions enabling faster postoperative recovery. Minimally invasive surgical technology has replaced aged-old techniques of cutting and stitching. The evolution from laparoscopic to robotic platforms, and now with augmented and virtual reality, provide tools for the surgeons of tomorrow - with adequate training- to navigate complex surgical anatomy with greater confidence. t surgical road maps in Oesophageal surgery. My hope is that the next generation will adopt these technologies thoughtfully to achieve better safety, faster recovery, and superior outcomes.

GB: In your view, how can we strengthen the role that public-sector healthcare plays delivering care for Oesophageal disease in India?

TKC: To answer this question, one should first focus on the Oesophageal diseases that are common in our population, like corrosive strictures, achalasia, reflux disease, and Oesophageal cancer. Public awareness must be increased through community outreach and education. Patients identified with disease should be referred to higher public health facility. Doctors practicing in tier-two hospitals should remain updated regarding the various aspects of Oesophageal diseases through seminars /symposium involving faculty from major high-volume centres. Screening programmes can be arranged to help identify high-risk individuals, especially for cancer.

GB: Cost remains a major barrier to accessing advanced GI surgery. What practical steps can improve affordability without compromising quality?

TKC : Practical steps to improve affordability could include:

-Providing appropriate care at nearby higher centres

-Arranging travel and affordable accommodation when needed

-Avoiding excessive hospital visits

-Ensuring timely diagnostic evaluation without undue delay.

-Utilizing public sector facilities, especially diagnostic and surgical services, which are often free.

-Allocating funds for deserving patients, to provide much needed financial support

GB: How should surgeons balance adoption of new technology with economic realities and ethical responsibility to patients?

TKC: Robotic surgery, although a revolutionary minimally invasive procedure, comes at significant cost. The procedure, including economic impact, must be explained to patients, who should provide informed consent. Those aspiring to adopt robotic surgery should undergo adequate training, both through virtual simulation modules and under expert supervision. The cost of the infrastructure remains a concern . Manufacturers must take this issue seriously and takes steps to address it so that economically disadvantaged patients may also benefit from the technology.

GB: Looking back, what lessons from your career would you most like the next generation of Surgical Gastroenterologists to carry forward?

TKC : The most important lessons I would like the next generation to carry forward are:

A. Be sympathetic to your patients.

B. Approach them in a gentle manner.

C. Avoid brisk or dismissive conversations.

D. Gain their confidence.

E. Listen patiently to their stories.

F. Maintain eye contact.

G. Allay their anxiety.

H. Explain their condition clearly.

I. Reassure them that you will do your very best.

J. Always document all patient interactions.

K. Remember: We are there because of them. Justify your presence.

Top surgeons who transformed Oesophageal surgery

James D. Luketich, MD, FACS Pioneer of Minimally Invasive Oesophageal Surgery

Early Life and Education

James D. Luketich was born with an evident gift for the sciences, a quality that would carry him from undergraduate study at Old Dominion University in Norfolk, Virginia, to a master's degree in biochemistry at Vanderbilt University — an unusual step that gave him a depth of scientific training rare among surgeons of his generation. He went on to earn his medical degree from the Medical College of Pennsylvania in Philadelphia, graduating Magna Cum Laude at the top of his class. The distinction was characteristic: he was inducted into Alpha Omega Alpha — the highest academic honor in American medicine — in his junior year, and graduated with the Surgery Award, the Medicine Award, the Endocrine Award, the Dean's Award, and the AOA Research Award simultaneously.

His postgraduate training was equally formidable. He completed thoracic surgery fellowships at three of the most prestigious institutions in North America: New York Presbyterian Hospital (Cornell Campus), Memorial Sloan Kettering Cancer Center, and the Cleveland Clinic — an extraordinary breadth of exposure that shaped his instinct for technical excellence and innovation. Before joining UPMC, he served as a Senior Instructor in Surgery at Memorial Sloan Kettering and held academic positions at Cornell University Medical College and the University of Pennsylvania.

Arrival at Pittsburgh and Rise to Prominence

In 1994, Luketich was recruited to the Division of Cardiothoracic Surgery at the University of Pittsburgh Medical Center, where his career would truly take flight. By the mid-2000s, under his leadership, UPMC had become widely regarded as the premier center for Oesophageal surgery in the United States. In 2010, he was appointed Founding Chair of the newly established Department of Cardiothoracic Surgery at the University of Pittsburgh School of Medicine — a position he held until 2023. He currently holds the Henry T. Bahnson Professorship of Cardiothoracic Surgery, one of the most distinguished named chairs in American surgery.

The Minimally Invasive Esophagectomy: A Paradigm Shift

Luketich's defining contribution to surgery is the development and worldwide popularization of the minimally invasive esophagectomy (MIE). In 1996, he performed one of the world's first totally minimally invasive esophagectomies — replacing what had historically been a devastatingly morbid open operation with a laparoscopic and thoracoscopic approach. Like many innovations, the technique was met initially with skepticism from the surgical establishment. But Luketich's results spoke decisively: in 2003, he published a landmark series of 222 consecutive MIE cases that demonstrated dramatically reduced morbidity, shorter hospital stays, and equivalent oncological outcomes compared to open surgery. The paper changed the field irreversibly.

In the traditional open esophagectomy era, operative mortality routinely exceeded 10 to 20 percent. Through MIE and the development

of centers of excellence, those rates have fallen sharply. Over the course of his career, Luketich has personally performed more than 2,500 minimally invasive esophagectomies — the largest reported single-surgeon series in the world. His work introduced a new standard of care not only for Oesophageal cancer but for the full spectrum of Oesophageal disease, including giant paraOesophageal hernias, achalasia, and Barrett's esophagus. He also helped usher in the robotic era of Oesophageal surgery, incorporating robotic-assisted techniques as the technology matured.

Research, Technology, and Multidisciplinary Care

Luketich's contributions extend far beyond the operating room. He has been principal or co-investigator on numerous NIH and National Cancer Institute grants, and his laboratory research has explored molecular staging of Oesophageal cancer, immunotherapy, and targeted biological therapies. He has championed a multidisciplinary model of cancer care — combining chemotherapy, radiation, and minimally invasive surgery — that is now standard practice globally for locally advanced Oesophageal cancer. He has also been a vocal advocate for the role of emerging technologies, including harmonic scalpel devices, articulating endoscopic staplers, and next-generation robotic platforms in reducing operative complications and broadening access to MIE for surgeons earlier in their learning curves.

Scholarship, Leadership, and Legacy

The scope of Luketich's academic output is formidable: more than 400 peer-reviewed manuscripts, 150 invited reviews and textbook chapters, and over 350 conference abstracts. He serves on the editorial boards of the Annals of Surgery, the Annals of Thoracic Surgery, the Journal of Thoracic and Cardiovascular Surgery, and the Journal of Gastrointestinal Surgery. He is a Fellow of the American College of Surgeons and a member of the American Surgical Association and the American Association for Thoracic Surgery, among many others. He has been repeatedly named to Best Doctors in America and has received the Ralph C. Wilde Leadership Award from the Allegheny County Medical Society, among numerous honors.

James D. Luketich's legacy is that of an architect of modern Oesophageal surgery. Where others accepted the morbidity of open surgery as an unavoidable price of treatment, he asked whether it had to be that way — and then proved, through thousands of carefully documented cases and decades of relentless innovation, that it did not. His work has saved and improved countless lives, and his influence continues to reverberate through every minimally invasive esophagectomy performed around the world today.

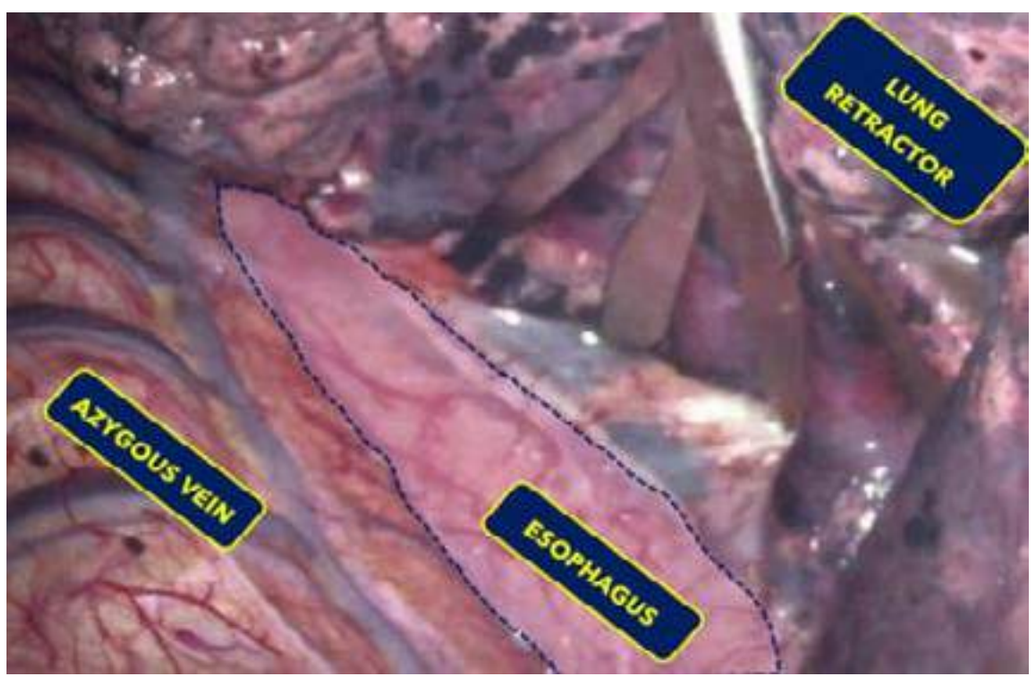
Minimally Invasive Esophagectomy – Patient Positions

Minimally invasive esophagectomy, especially for thoracic Oesophageal mobilization, offers the obvious advantages of avoiding thoracotomy, reducing blood loss, decreasing postoperative pain, and improving respiratory mechanics. A left lateral decubitus is the standard choice for a thoracotomy in open procedures. Three patient positions are described for minimally invasive thoracic Oesophageal mobilization: the left lateral decubitus, semi-prone & prone. All three positions offer specific advantages and disadvantages, and surgeons utilize them based on their training experience and surgical preference. In this article, the various positions are described with a schematic and technical aspects of each.

Left Lateral Decubitus –

The left lateral decubitus position was initially described in 1992 by Cuschieri et al and popularized by Luketich et al. In this position, the surgeon stands behind the patient with working ports in the 5th and 7th intercostal spaces, the camera in the 8th intercostal space in the mid-axillary line, and the assistant retraction ports placed anteriorly as shown.

From the surgeon's perspective, it maintains an anatomical view comparable to that encountered during conventional open thoracotomy. The primary benefit of this patient position is the ability to rapidly convert to an open thoracotomy without repositioning the patient. Nevertheless, access to the upper mediastinum is restricted, particularly concerning the left recurrent



Figures 1 & 2**: **Lateral decubitus position with port placement**; **Intraoperative view of the esophagus with lung retraction

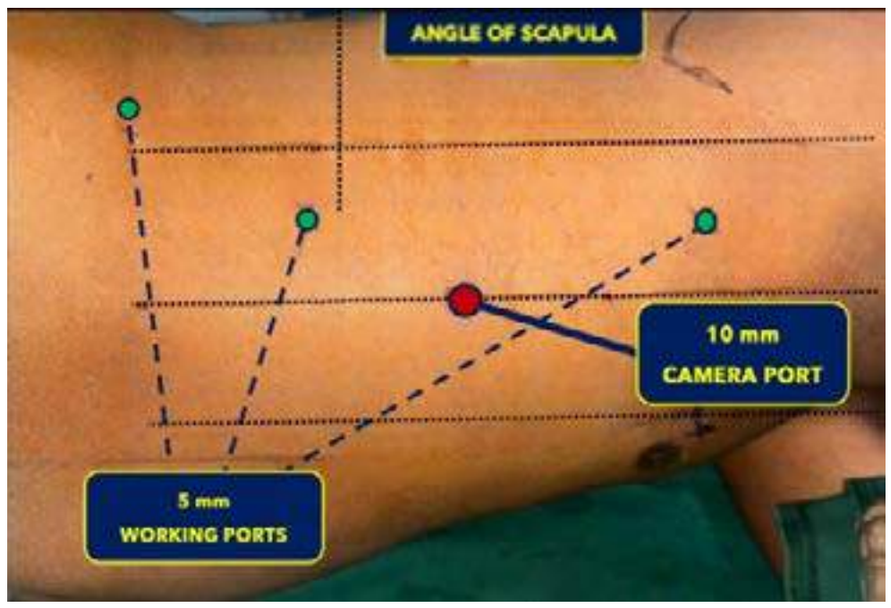
laryngeal lymph node stations. Adequate visualization requires retraction of both the lung and the diaphragm, thereby necessitating an additional assistant port. Accumulation of blood within the operative field is another limitation. Moreover, prolonged abduction of the surgeon's arms during the procedure contributes to increased shoulder and upper-limb fatigue.

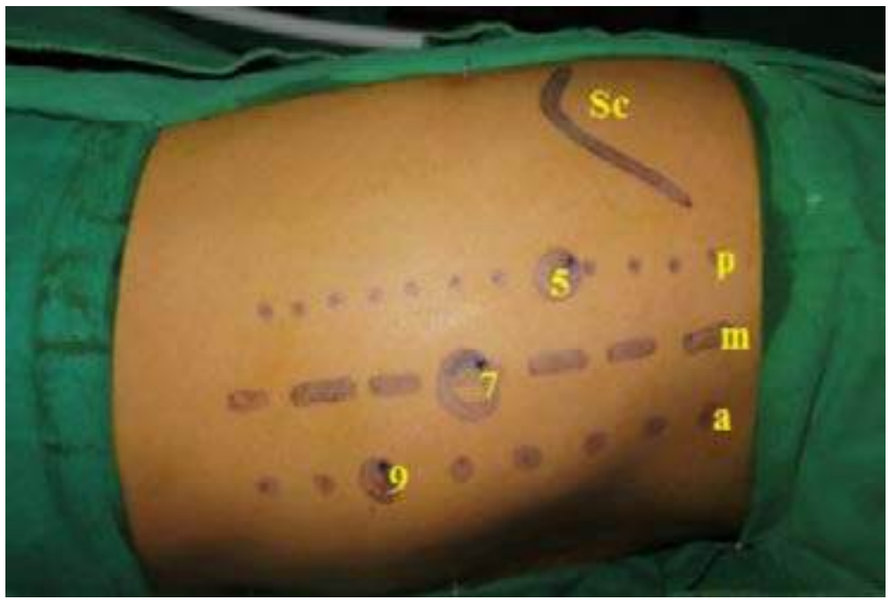
Semi-prone –

The patient is placed in a left lateral decubitus position with an anterior inclination (tilt) of 45 degrees. A double-lumen endotracheal tube is preferred for single-lung ventilation; however, a routine single-lumen endotracheal tube could also be used. Carbon dioxide insufflation is used at a pressure of 6-7 cm of H2O to compress the ipsilateral lung, improving visualization of the operative field. Compared to the lateral decubitus position, only 2 working ports are needed, with an additional port for azygous division, if required.

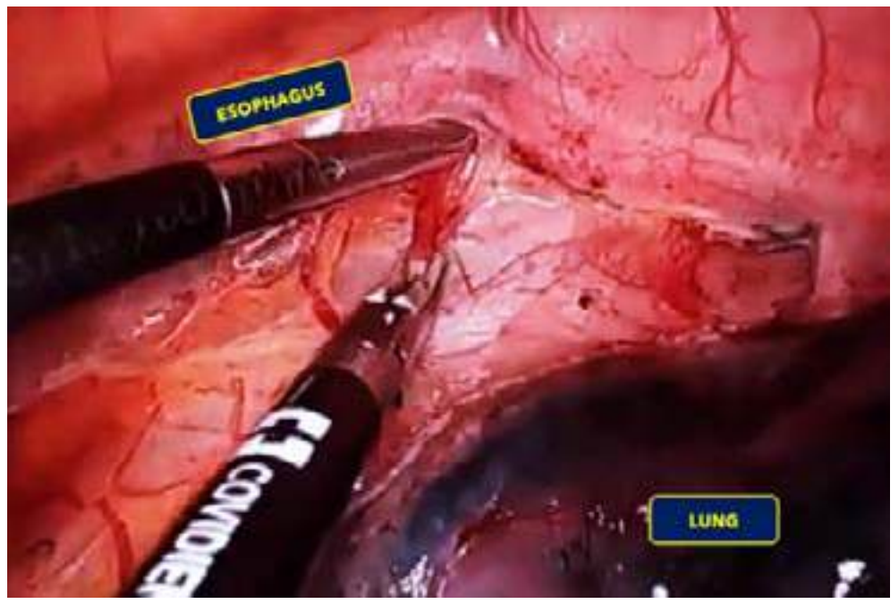
This position affords optimal exposure of the esophagus and the posterior mediastinum, allowing clear visualization of the thoracic duct along its entire course. Bilateral recurrent laryngeal lymph node dissection can be performed safely and efficiently. Blood pooling

in the operative field is minimal. Improved instrument spacing enhances ergonomics, and maintaining the surgeon's elbows at the patient level reduces elbow strain and overall **fatigue.**





Patient in semi-prone position with port positions as depicted in the 5th, 7th, and 9th Intercostal spaces with the surgeon and assistant on the right side of the patient



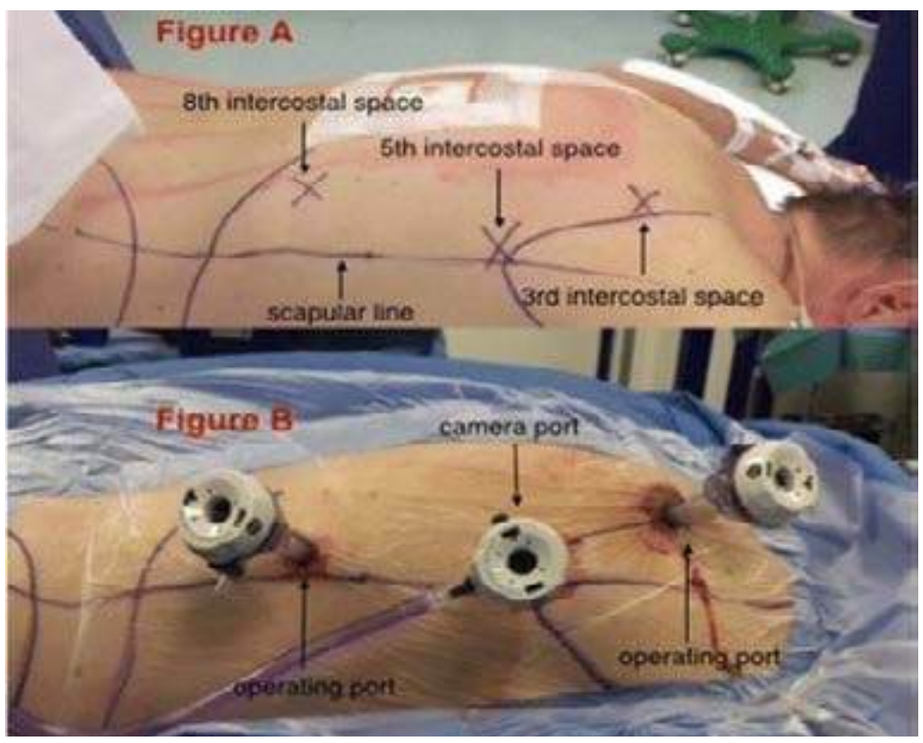
Alternative semi-prone port placement – 4th & 8th ICS working ports with Camera in 6th ICS mid-axillary line, 12th ICS port for Azygous division; Intraoperative view of the esophagus

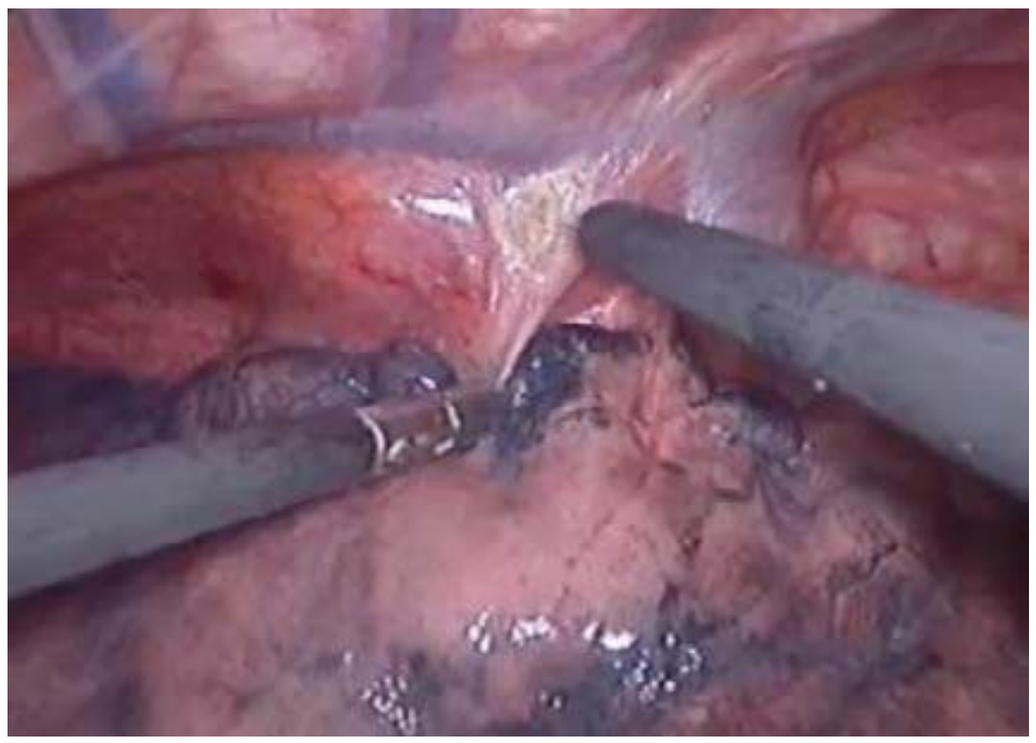
(Reproduced with permission - Pawar SB et al. Minimally Invasive Esophagectomy in Semi-Prone Position (Pawar Technique): Technical Aspects and Outcome in 224 Patients. South Asian J Cancer. 2020 Oct;9(4):213-221. doi: 10.1055/s-0041-1726164. Epub 2021 Jun 12)

Prone –

Thoracoscopic mobilization of the esophagus in the prone position was initially reported by Cuschieri in 1994 in a series of six patients. Subsequently, several authors advocated the prone position for improved visualization of the posterior mediastinum. More recently, a systematic review reported lower rates of pulmonary complications and reduced intraoperative blood loss in minimally invasive esophagectomy performed in the prone position compared with the left lateral decubitus approach.

The The gravitational effect in the prone position allows the lung to fall away naturally, eliminating the need for active lung retraction and preventing blood from obscuring the operative field. Additionally, the lower positioning of the surgeon's hands reduces physical strain and fatigue. Ergonomic assessments, including those by Shen and colleagues, have demonstrated that the prone position is superior to the lateral position. Despite these advantages, conversion to a conventional thoracotomy is more challenging and time-consuming when the patient is prone, which can be a significant drawback in emergency scenarios.





Prone position with ports placed as shown; Intraoperative view of the esophagus

(Charalabopoulos A, Lorenzi B, Kordzadeh A, Tang CB, Kadirkamanathan S, Jayanthi NV. Role of 3D in minimally invasive esophagectomy. Langenbecks Arch Surg. 2017 May;402(3):555-561. doi: 10.1007/s00423-017-1570-0. Epub 2017 Mar 1. PMID: 28251360)

Sr no.	Parameters	Lateral position	Prone position	Semi-prone position
1	Exposure to thorax and surroundings	Limited	Adequate	Adequate
2	Ease of dissection at subcarinal, left recurrent laryngeal group, and posterior mediastinum	Difficult	Good	Best
3	Need for lung retraction—an extra port	Yes	No	No
4	Single-lung ventilation	Required	Required	Not required
5	Ergonomics:			
	1. Crowding of instruments	No	Yes	No
	2. Elbow fatigue	Maximum	Minimum	Minimum
6	Pooling of blood intraoperatively	Maximum	Minimum	Minimum
7	Conversion to thoracotomy	Easy and quick	Difficult; takes time	Easy and quick

Table 1: Comparative features of patient positioning for minimally invasive esophagectomy

(Reproduced with permission - Pawar SB et al. Minimally Invasive Esophagectomy in Semi-Prone Position (Pawar Technique): Technical Aspects and Outcome in 224 Patients. South Asian J Cancer. 2020 Oct;9(4):213-221. doi: 10.1055/s-0041-1726164)

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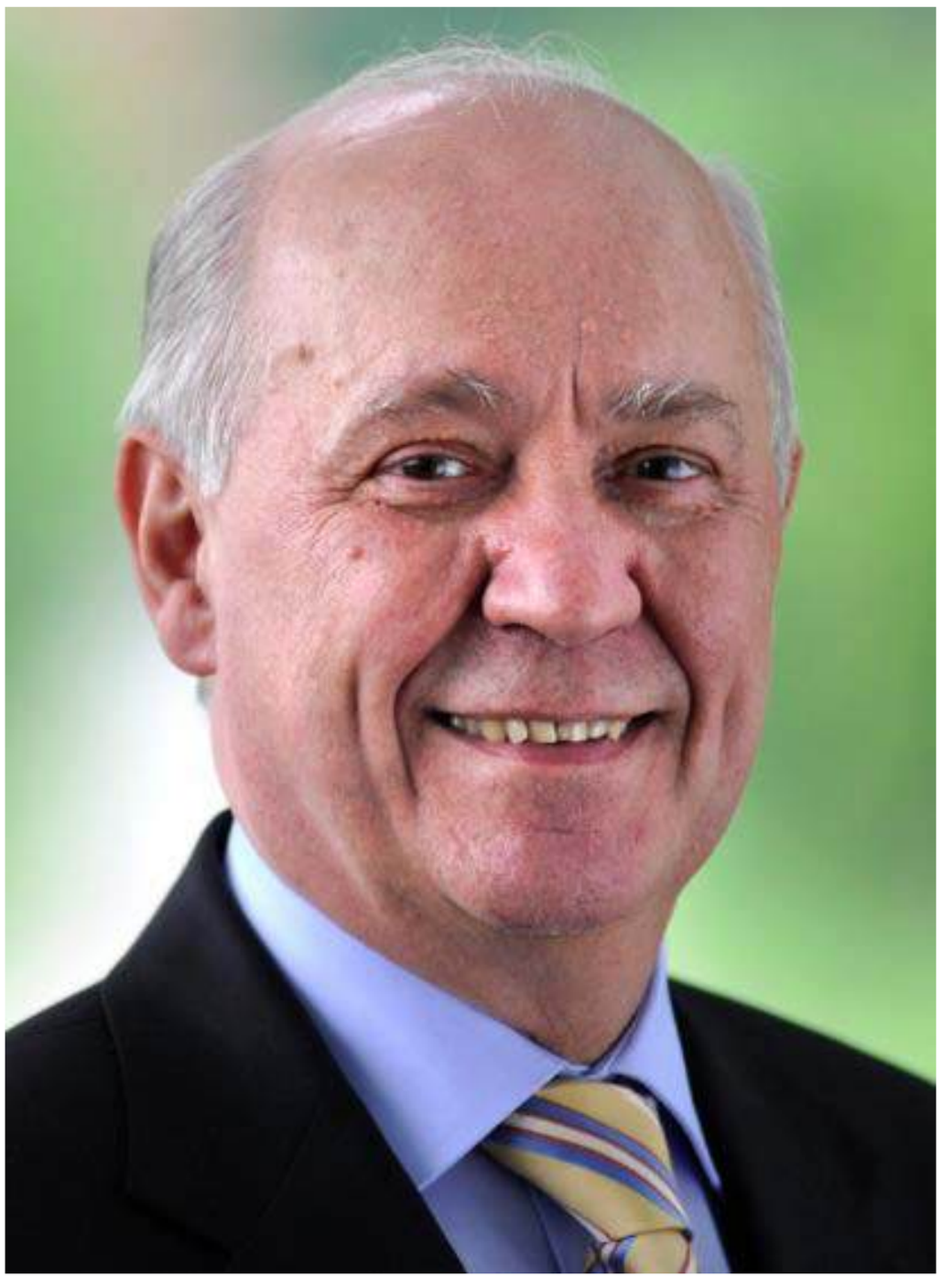
Top surgeons who transformed Oesophageal surgery



Professor Antoon (Toni) Lerut, MD, PhD
Architect of European Oesophageal Surgery

Origins and Medical Formation

Antoon Lerut — known universally in surgical circles as Toni — was born into a medical family in a small Belgian town, an upbringing that instilled in him both a sense of vocation and intellectual seriousness from an early age. He earned his medical degree in 1970 from the Catholic University of Leuven (KU Leuven), one of the oldest and most prestigious universities in Europe, before completing his training in general surgery at the same institution in 1975. Under the mentorship of Professors Albert Lacquet and Jacques Gruwez, his early academic interests crystallized around two of the most complex challenges in the field: caustic burns of the esophagus and the surgical correction of Oesophageal atresia in children. These technically demanding conditions gave him an intimate understanding of the esophagus that would define his entire career.

Recognizing the importance of international exposure, Lerut undertook two pivotal fellowships that shaped his surgical philosophy profoundly. The first was as a registrar in thoracic surgery under Ronald Belsey at Frenchay Hospital in Bristol, England — one of the twentieth century's most revered Oesophageal surgeons. The second was a guest scholarship in 1982 with David Skinner and Tom DeMeester at the University of Chicago, two of the defining figures in American Oesophageal surgery. From these experiences, Lerut drew two guiding convictions that would anchor his career: that Oesophageal disease demanded a rigorous multidisciplinary approach, and that international collaboration would be essential to advancing the science.

Building a Center of Excellence at Leuven

Returning to Leuven after his fellowships, Lerut rejoined the Department of General Surgery under Professor Gruwez and rapidly established himself as a clinician-scientist of the first order. He was appointed Full Professor of Surgery in 1989. Then, in 1994, came the appointment that defined his legacy: he became Chairman of a newly established and independent Department of General Thoracic Surgery at KU Leuven and University Hospital Gasthuisberg. From this platform, Lerut assembled a team of gifted young academic surgeons and built what would become widely regarded as the premier center for thoracic and Oesophageal surgery in Europe. Over the following two decades, the department attracted more than 70 international thoracic surgery fellows and PhD students from across the globe — a testament to its reputation for both clinical excellence and academic rigor.

Under Lerut's chairmanship, the department pioneered Leuven's lung transplantation program in 1991, which grew into one of the leading programs in Europe. His clinical expertise spanned the full spectrum of thoracic disease: Oesophageal cancer, benign Oesophageal disorders, lung cancer, mediastinal tumors, and advanced lung volume reduction surgery. He placed particular emphasis on neoadjuvant multimodal therapy — the combination of chemotherapy and radiotherapy before surgery — as a means of improving long-term survival in Oesophageal cancer, publishing landmark series that helped establish this approach as standard of care internationally.

Scientific Contributions and Scholarly Output

The breadth and depth of Lerut's academic output is remarkable. He has authored or co-authored more than 350 articles in international peer-reviewed journals and over 100 book chapters. He is co-editor of Pearson's Thoracic and Oesophageal Surgery — the definitive reference text in the specialty, used by surgeons and trainees worldwide. His research contributions have ranged from surgical technique and perioperative outcomes to cancer staging, molecular biology of Oesophageal adenocarcinoma, and the development of enhanced recovery protocols after esophagectomy. He has also authored and co-authored multiple chapters in Sugarbaker's Adult Chest Surgery, the other major reference compendium of the field. Even after his formal retirement, Lerut has remained an active contributor to the academic literature, including publications as recently as 2024 and 2025.

Global Leadership and International Collaboration

Few surgeons have held as many positions of international leadership simultaneously as Lerut. He served as President of four major surgical societies: the European Association for Cardio-Thoracic Surgery (EACTS), the European Society of Thoracic Surgeons (ESTS), the International Society for Diseases of the Esophagus (ISDE), and the European Surgical Association — an extraordinary quadruple distinction that speaks to the breadth of his influence. He also served as Chairman of the UEMS Section of Thoracic Surgery, the body responsible for harmonizing thoracic surgery training standards across Europe. His engagement with the ISDE dates to its founding years, having attended its inaugural meeting in 1980 and participated in the society's development from its earliest days.

Beyond formal leadership roles, Lerut has served as a visiting professor at academic institutions across North America, Asia, Turkey, and China. He has been awarded honorary fellowships by 14 prestigious surgical organizations, including the American Association for Thoracic Surgery, the American Surgical Association, the American College of Surgeons, the Royal College of Surgeons of England, and the Royal College of Surgeons in Ireland — a global recognition of his contributions that is virtually unmatched among European thoracic surgeons. In retirement, he has channeled his energies into global surgical education, collaborating with physicians in Mali, The Gambia, Guinea, and Burkina Faso to develop programs for treating children with caustic Oesophageal strictures — returning, with characteristically quiet purpose, to the very problem that first drew him to the esophagus.

Legacy

Toni Lerut's legacy in surgery is that of a builder: of institutions, of collaborations, of a generation of academic surgeons who carry his values of intellectual rigor, clinical excellence, and international fellowship into operating rooms around the world. He transformed KU Leuven from a respected European teaching hospital into a global reference center for Oesophageal and thoracic surgery. He championed multimodal cancer care decades before it became standard practice. And through his four society presidencies, his 350 peer-reviewed publications, and his personal mentorship of more than 70 international fellows, he helped shape the very architecture of modern thoracic surgery. Described by colleagues as a consummate gentleman-scholar, Lerut embodies a tradition of surgical leadership defined not by ego but by an abiding commitment to the welfare of patients and the advancement of knowledge.

The Vacuum advantage: Transforming the management of surgical dehiscences

Introduction

Anastomotic and iatrogenic leaks in the esophagus and low rectum are high-impact complications with significant morbidity and mortality.1 Following Oesophageal resection, reported anastomotic leak rates range from 11.4% to 21.2%, with associated mortality rates varying between 7.2% and 35%.2 Similarly, after colorectal surgery, the incidence of anastomotic leakage has been reported to range from 2.8% to 8.4%, while mortality rates range from 1.7% to 16.4%.3 Over the past two decades, endoscopic vacuum therapy (EndoVAC) has evolved from proof-of-concept case series into a widely adopted organ-preserving option for selected leaks. EndoVAC combines active drainage with negative-pressure– induced wound healing. The first clinical application of endoscopic vacuum therapy was reported in 2004, when Weidenhagen et al. demonstrated its effectiveness in controlling septic complications arising from rectal anastomotic leaks.4

How does EndoVAC work?

EndoVAC adapts negative-pressure wound therapy for hollow organs. Continuous suction collapses the cavity (macrodeformation), removes contaminated fluid, reduces oedema, increases perfusion, and mechanically stimulates granulation (microdeformation), promoting progressive cavity obliteration and eventual defect closure.5,6 The combination of active drainage plus tissue stimulation differentiates EndoVAC from passive approaches such as stents or percutaneous drains, which work by exclusion or drainage alone, respectively.

Candidates for EndoVAC therapy

Ideal candidates for EndoVAC are Oesophageal anastomotic leaks and contained perforations with cavities or contamination requiring drainage, as well as low rectal/pelvic anastomotic leaks with cavities accessible transanally, where anastomotic salvage is the goal. Ideal candidates have a drainable cavity, viable tissue margins, and are identified early, as earlier initiation is consistently associated with better outcomes. EndoVAC is less suitable for massive necrosis, complete dehiscence without viable tissue, or when endoscopic access to the cavity is not possible.6

Preprocedure assessment

Endoscopic assessment and contrast imaging define defect size, cavity, and adjacent structures. A prerequisite is a commercially available EndoVAC device or hand-crafted polyurethane sponges, trimmed to fit the cavity and secured to a drain. Placement is performed under endoscopic control. Intracavitary placement is preferred for defined and accessible cavities, whereas intraluminal placement can be used when no defined cavity exists or when the cavity is small and inaccessible.7 Continuous suction around –75 to –150 mmHg is commonly used; sponges are exchanged every 48–96 hours, with endoscopic reassessment at each exchange. Total duration ranges from days to several weeks, depending on cavity response.8

What is the expected benefit of EndoVAC?

In a landmark study, Weidenhagen et al. (2008) described the first influential clinical series evaluating transanal endoscopic vacuum therapy using the Endo-SPONGE® system in 29 patients with presacral anastomotic leakage following anterior resection, demonstrating effective control of the pelvic cavity and a high rate of anastomotic preservation.9 The earliest documented clinical use of endoscopic vacuum therapy for Oesophageal anastomotic leakage was reported in 2008 by Wedemeyer and colleagues, who described effective closure of intrathoracic leaks occurring after esophagectomy.10 High-quality pooled evidence supports the effectiveness of EndoVAC for gastrointestinal wall defects. A systematic review and meta-analysis of 366 patients with transmural Oesophageal defects reported robust pooled clinical success, with EndoVAC achieving closure in 86.5% of anastomotic leaks and 89% of perforations.11 Multiple studies show that Intracavitary EndoVAC is more effective than intraluminal placement for leak healing. In a study by Hyun- Jung et al. involving 119 patients treated with EndoVAC for upper gastrointestinal leaks and perforations, neoadjuvant therapy and intraluminal (as opposed to intracavitary) sponge placement were identified as independent predictors of treatment failure.12

How does it fare compared to its alternatives? In a prior

systematic review and meta-analysis by Scognamiglio et al., which included five retrospective studies comprising 274 patients with postoperative esophago-enteric anastomotic leaks, the outcomes of EndoVAC were compared with those of endoscopic stent placement. EndoVAC was associated with a higher rate of leak closure, a greater need for endoscopic device exchanges, a shorter overall treatment duration, and a lower mortality rate13. However, no statistically significant differences were observed in short-term or major complication rates between the two treatment modalities.13 Survival outcomes appear to favour EndoVAC in high- risk scenarios. A retrospective analysis comparing EndoVAC, endoscopic stenting, and surgical revision for post-esophagectomy anastomotic leaks demonstrated the lowest mortality in the EndoVAC group. These findings are supported by pooled data from five comparative studies, which showed that EndoVAC was associated with higher fistula closure rates, lower mortality, and fewer adverse events than endoscopic stenting.14,15,16

Challenges in clinical practice

The conventional EndoVAC system (Endo-SPONGE®, B-Braun, Germany) has traditionally been described using relatively high negative pressures (125–150 cm H_2O). The application of such high pressures is associated with chest discomfort, particularly in patients with reduced pulmonary compliance, and may increase the risk of pulmonary complications, including respiratory infections. The cost of the Endo-SPONGE was high, and its commercial availability in India was an issue. In addition, the pressure settings needed to be modified. These observations have prompted a shift toward innovative strategies in EndoVAC therapy, including lower negative pressure, in selected patients to improve tolerability without compromising efficacy.1

In our series, we evaluated a modified, cost-effective endoscopic vacuum therapy system (mEndoVac; Figure 1) in a cohort of 18 patients with postoperative gastrointestinal anastomotic leakage, using a differential pressure strategy based on leak location. A polyurethane sponge sutured over a Ryle's tube or Suction catheter was used as the Vacuum device. This helped tailor the sponge to the cavity size and significantly reduced the cost. Upper gastrointestinal leaks were managed with low negative

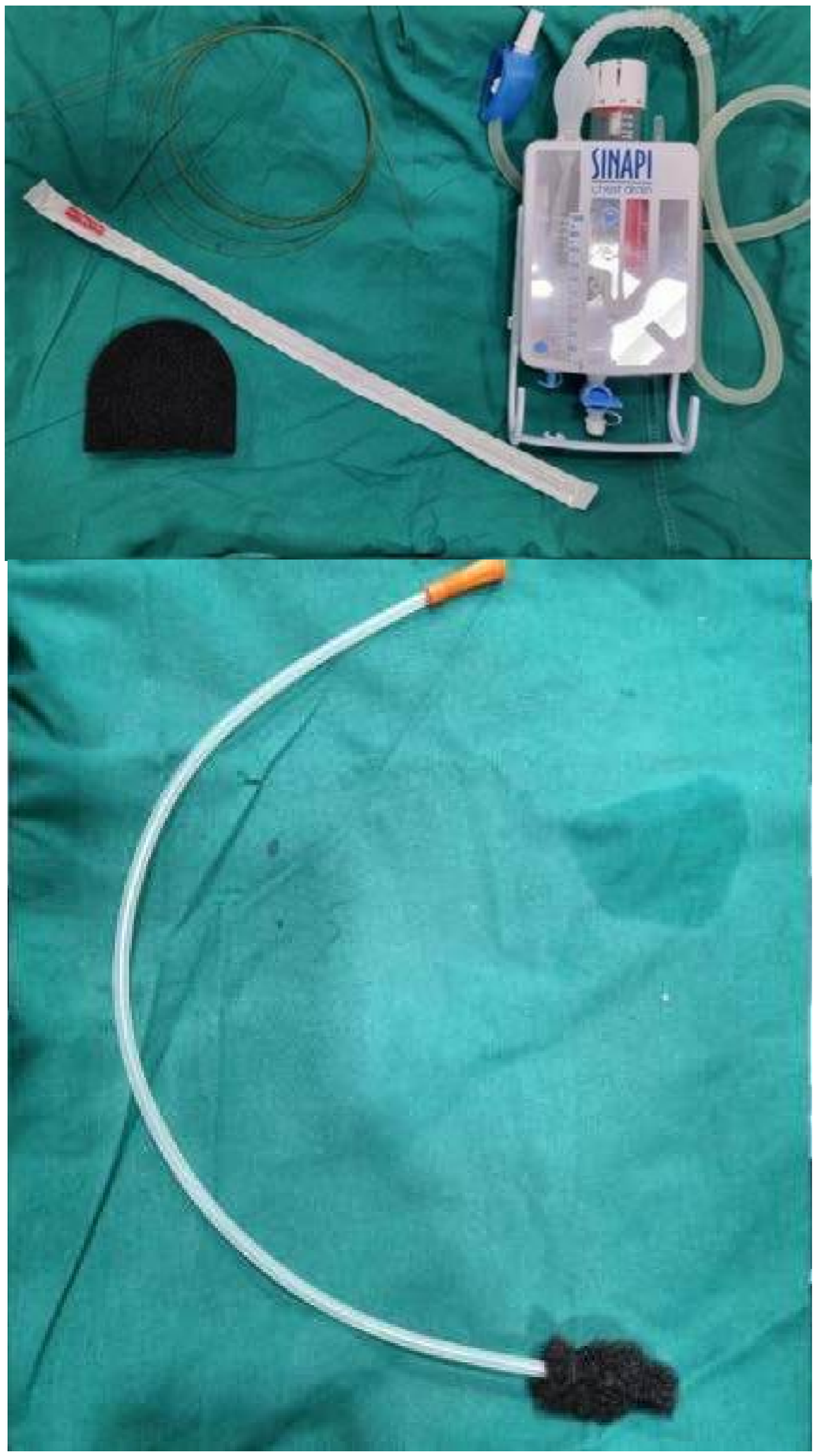


Figure 1: Polyurethane sponge, suction catheter, guide-wire, and Sinapi device used for Endoscopic Vacuum therapy (Left); Tailored device for over the guide-wire placement into the leak cavity (Right)

pressure (25–30 mmHg, titrated using Sinapi), whereas lower gastrointestinal leaks received conventional high negative pressure (125–150 mmHg). Complete cavity resolution, defined as clinical success, was achieved in 16 of 18 patients (88.8%) (Figure 2). Procedure-related adverse events were observed in 27.7% of cases, all of which were mild. Introduction of the device into the cavity, especially in post-esophagectomy settings with high anastomosis, is challenging. However, the device is placed over a guide wire, and the endoscope can be used to guide it into

the cavity. Alternatively, in patients with an external drain, a rendezvous

approach with guide-wire passed through the drain into the cavity and subsequently pulled out through the mouth, can be used for placing the device more easily. In some cases, an Oesophageal length overtube may come in handy, especially in patients on mechanical ventilation.

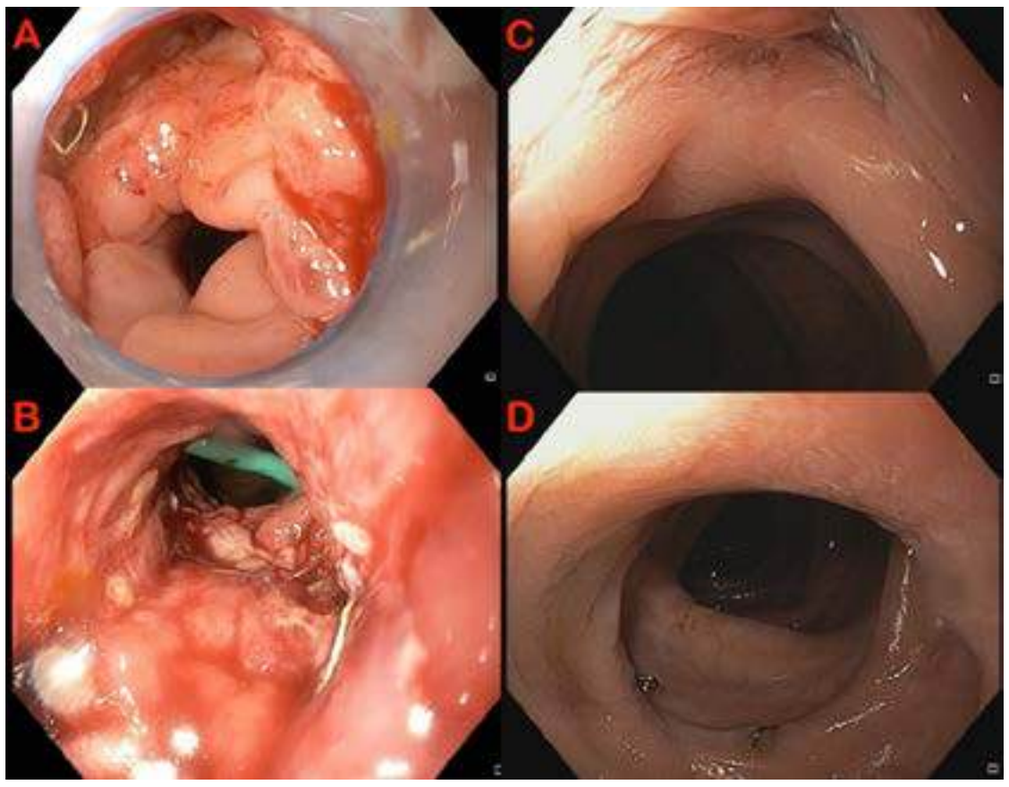


Figure 2: (A) Leak from the anterior resection anastomotic line (B) Pigtail seen inside the leak cavity (C) Complete healing of the anastomotic leak after 3 sessions of EndoVAC (D) Healthy post anterior resection anastomotic line

Top tips for Endoscopic Vacuum Therapy (EndoVAC)

1. Tailor the EndoVAC device to the size of the cavity

2. Intracavitatory placement is better than intraluminal placement

3. Pressure titration essential to ensure lung compliance and reducing risk of infection

4. Can increase pressure if poor response after initial EndoVAC placement

5. Can consider rendezvous technique of placement (in cases with external drain in situ)

in those with difficulty in placing the device

6. Watch for adequate pulmonary excursion and lung expansion in mediastinal leaks

7. Change device every 3-5 days with documentation of evidence of healing (granulation

tissue formation)

What are the expected adverse events of EndoVAC?

EndoVAC is generally well tolerated; however, several adverse e ffects have been reported. Bleeding, most commonly during sponge exchange, is the most frequent complication and is

usually minor, although clinically significant haemorrhage has been described in 5–10% of cases. Sponge ingrowth into granulation tissue may occur with prolonged dwell time, occasionally complicating removal. Pain and discomfort, particularly with transanal EndoVAC, are common but manageable with analgesia. Stricture formation, especially after Oesophageal EndoVAC, has been reported in 10–15% of patients. Overall, meta-analyses report low major complication rates, comparable to or lower than endoscopic stenting.17

Conclusion

Despite its proven e fficacy, endoscopic vacuum therapy faces several practical challenges, including the need for repeated endoscopic procedures, resource intensity, lack of standardised protocols regarding pressure settings and exchange intervals, and dependence on operator expertise and multidisciplinary coordination. Patient selection remains critical. current evidence is largely derived from retrospective series and meta-analyses, with a paucity of randomised controlled trials. Nevertheless, EndoVAC has emerged as a highly e ffective, organ-preserving strategy for selected esophagal and low rectal leaks, consistently demonstrating high closure rates and favourable outcomes compared with conventional approaches. With increasing experience, technological refinement and innovation, and future prospective studies, EndoVAC is likely to become further integrated into standardised management algorithms for gastrointestinal leaks across India.

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Top surgeons who transformed Oesophageal surgery

Professor Hiroshi Akiyama, MD (1931–2012)
Father of the Three-Field Lymphadenectomy

Origins, Education, and Early Formation

Hiroshi Akiyama was born on 2 July 1931 in Chiba, Japan, the son of Dr. Mizuki Akiyama — a lineage that placed the practice of medicine at the very center of his childhood world. He studied medicine at the University of Tokyo, one of Japan's most distinguished institutions, qualifying in 1955. His early postgraduate years reflected an admirable appetite for international experience: he undertook a rotating internship at the United States Army Hospital at Camp Zama, followed by a surgical internship at Buffalo General Hospital in New York on a Fulbright scholarship from 1956 to 1957. Returning to Japan, he completed his surgical residency in Tokyo before embarking on a research career that would occupy him from 1975 to 1986, investigating tumour biology in Oesophageal cancer, techniques of gastrointestinal anastomosis, and the principles of radical cancer dissection.

These formative years at the intersection of Eastern surgical tradition and Western academic medicine produced a surgeon of exceptional technical precision and scientific discipline. Akiyama was drawn above all else to a question that had troubled Oesophageal oncologists for decades: why did so many patients with apparently resectable Oesophageal cancer still die of their disease within years of surgery? The answer, he would come to believe, lay not in the esophagus itself, but in the vast and underappreciated lymphatic network surrounding it.

Toranomon Hospital and the Rise of a Master Surgeon

Akiyama built his career at Toranomon Hospital in Tokyo, where he would eventually serve as Chief of Surgery and Professor of Surgery — roles that gave him both the clinical volume and the institutional authority to develop and refine techniques of a scope and complexity that few other surgeons could attempt. The hospital became a magnet for cases from across Japan and beyond, and Akiyama's operating lists accumulated the kind of experience that transforms a technically gifted surgeon into a genuine innovator. He developed a particular expertise in surgery of the upper gastrointestinal tract: the esophagus, the stomach, the hypopharynx, and the complex reconstructions that their removal demanded.

Among his technical achievements was the development and popularization of gastric tube reconstruction — the use of the stomach, fashioned as a narrow isoperistaltic conduit, to replace the resected esophagus. By demonstrating that the stomach, if properly prepared, offered a reliable and functionally satisfactory substitute, Akiyama helped establish the gastric pull-up as the dominant reconstructive approach in Oesophageal surgery worldwide. He reported a series of 130 such cases with a single operative death — a 0.8 percent mortality that was, for its era, extraordinary. He also described and refined the left thoracoabdominal approach for cancers of the esophagogastric junction, a technique recognized by his name and still referenced in the contemporary literature.

The Three-Field Lymphadenectomy: A Paradigm Transformed

The contribution for which Hiroshi Akiyama is most universally celebrated is the development and systematic description of three-field

lymphadenectomy for Oesophageal cancer. Through meticulous pathological examination of resected specimens, Akiyama and his team demonstrated that Oesophageal cancer — unlike most other gastrointestinal malignancies — spreads lymphatically in both directions along the esophagus with equal facility, and can involve nodes in the neck, the mediastinum, and the abdomen simultaneously, regardless of the primary tumour's location. This anatomical reality made conventional two-field dissection — which addressed only the mediastinum and abdomen — fundamentally inadequate for cure in many patients.

In 1981, Akiyama published his landmark paper in the Annals of Surgery — "Principles of Surgical Treatment for Carcinoma of the Esophagus: Analysis of Lymph Node Involvement" — formalizing the principles of three-field dissection: systematic removal of more than 100 lymph nodes from the lower neck, the entire mediastinum, and the upper abdomen. The approach demanded exceptional technical skill and carried significant morbidity, but the oncological outcomes were transformative. A nationwide Japanese survey published in 1991 confirmed that patients undergoing three-field dissection achieved a five-year survival rate of 34.3 percent, compared with 26.7 percent for those undergoing two-field dissection — a statistically significant improvement in a disease notorious for poor prognosis. Akiyama's own team at Toranomon reported a five-year survival of 53.8 percent for patients treated with curative intent — figures that were, at the time, unmatched anywhere in the world.

It is worth noting that Akiyama also made an early and important contribution to minimally invasive approaches: in 1971, he and his colleagues reported one of Japan's first blunt dissection techniques for Oesophageal extraction without open thoracotomy — an approach whose conceptual thread runs directly to the transhiatal and thoracoscopic techniques that would transform the field two decades later.

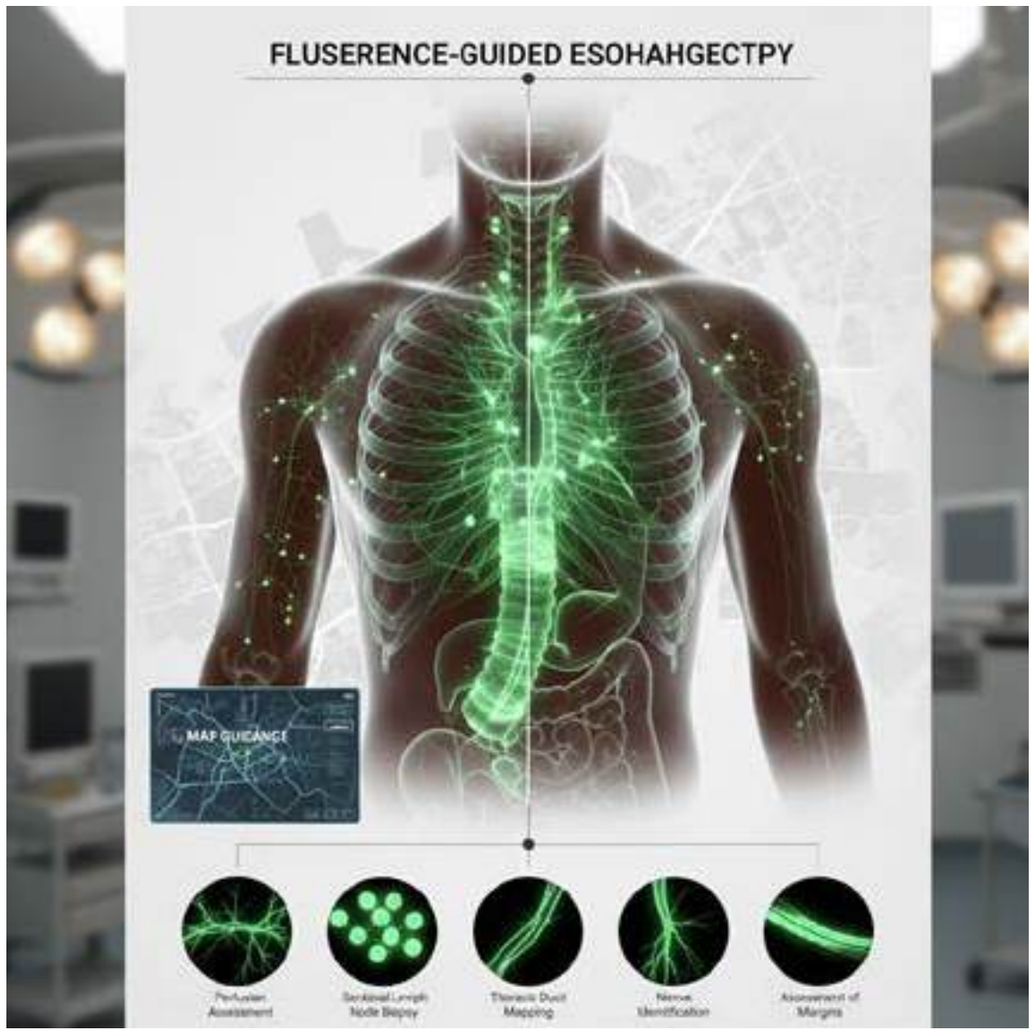
Scholarship, Character, and International Influence

Akiyama's academic output was both prolific and meticulous. His 1990 monograph, Surgery for Cancer of the Esophagus, published by Williams & Wilkins in Baltimore, became one of the most influential surgical texts of the late twentieth century — a precise, beautifully illustrated volume that disseminated his techniques to surgeons across the globe. Colleagues who visited Toranomon to observe his work returned not merely with new technical knowledge but with a deeper sense of what surgical standards could be. Those who worked closely with him described his approach in terms that went beyond the purely technical: he was, by all accounts, quiet, unassuming, and humble — genuinely interested in teaching juniors and in sharing his methods openly. He was as determined to report his results accurately as he was to achieve perfection in the operating room. He was elected a Fellow of the Royal College of Surgeons of England, a distinction reflecting the esteem in which he was held internationally.

Outside surgery, Akiyama was a violinist and a devoted tennis player — pursuits that speak to the precision and discipline that also defined his surgical life. He married Kazuko Morimoto in 1958 and had three children, including a son, Futoshi, who became a plastic surgeon. Hiroshi Akiyama died on 21 September 2012, at the age of 81.

Legacy

Hiroshi Akiyama's legacy rests on a deceptively simple insight — that curing Oesophageal cancer requires understanding and systematically addressing where it spreads — and on the technical courage to act upon that insight at a time when others did not. Three-field lymphadenectomy remains the standard of surgical care for thoracic Oesophageal squamous cell carcinoma in Japan and is performed at leading centres worldwide. His gastric tube reconstruction technique is the dominant form of Oesophageal reconstruction practiced globally. His 1981 Annals of Surgery paper is among the most cited in the entire history of Oesophageal surgery. He stands, alongside Ivor Lewis, Mark Orringer, and James Luketich, as one of the foundational figures of the modern surgical management of Oesophageal cancer — a surgeon whose quiet humility was matched only by the magnitude of his contribution to human health.



Fluorescence Guided Esophagectomy – Poster Child of ICG's Compelling Potential

Fluorescence-guided surgery with indocyanine green (ICG) has moved from being an occasional novelty to a multipurpose adjunct in modern esophagectomy. In the initial days, whenever we would present a video on thoracic duct mapping, we would receive a comment from at least one audience member: "Are you not afraid that by training residents to operate with this technology, once they go out into the real world, they will not be able to operate without it?"

We had a different perspective. Imagine how we used to drive before Google Maps or Apple Maps. Today, if you want to navigate to a new place, what do you do? You use map guidance the first few times, but there comes a day when you no longer need it. This is how we view fluorescence-guided surgery. It helps you avoid wrong turns and remain on the correct path. It is of maximum benefit to surgeons new to this road, and once they master a procedure, it helps them identify roadblocks from afar and proceed with the utmost safety.

The first wave of clinical applications of ICG included two basic uses: perfusion assessment and sentinel lymph node biopsy. In the second wave, different ICG administration routes have been explored, and several interesting clinical applications have been described. Esophagectomy is a perfect example of how ICG can be used across different phases of a single procedure to bring objectivity to what was previously a largely subjective assessment.

Five contemporary uses of ICG in esophagectomy

1. Thoracic duct imaging

Being a translucent structure, the thoracic duct is difficult to identify and preserve during the thoracic phase of esophagectomy. Anatomical landmarks and surgical experience were the only defences against a chyle leak. Today, however, every member of our surgical team is proficient in performing ultrasound-guided ICG injection into an inguinal lymph node and in mapping the thoracic duct, its branches, and its occasional anatomical variations throughout the procedure. Flattening the learning curve and democratizing surgery—where the junior-most identifies a critical structure as confidently as the senior-most—represents an excellent outcome of this technology, to the point that reduced postoperative chyle leaks are emerging as a secondary benefit.

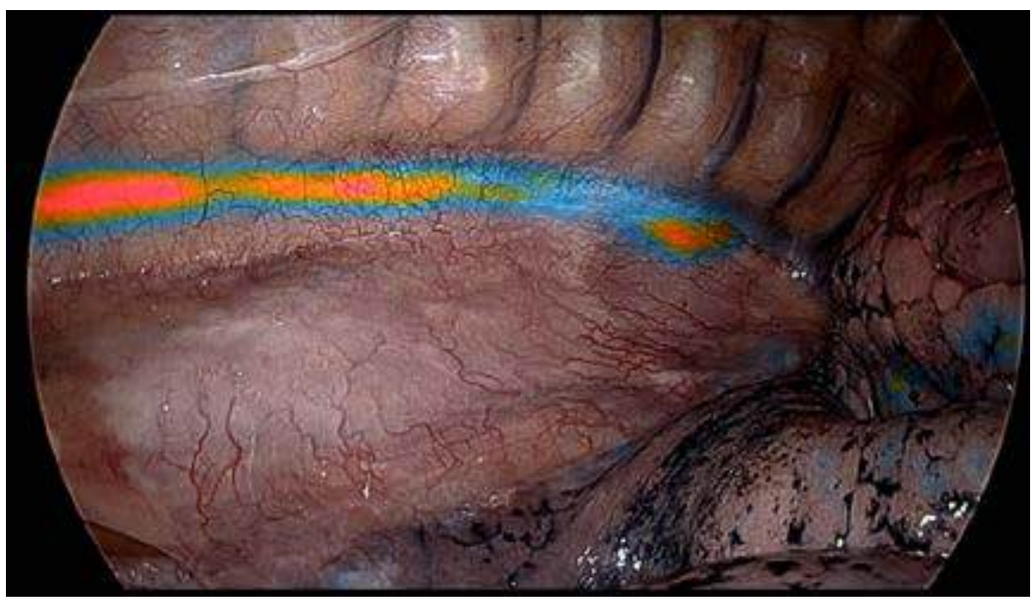
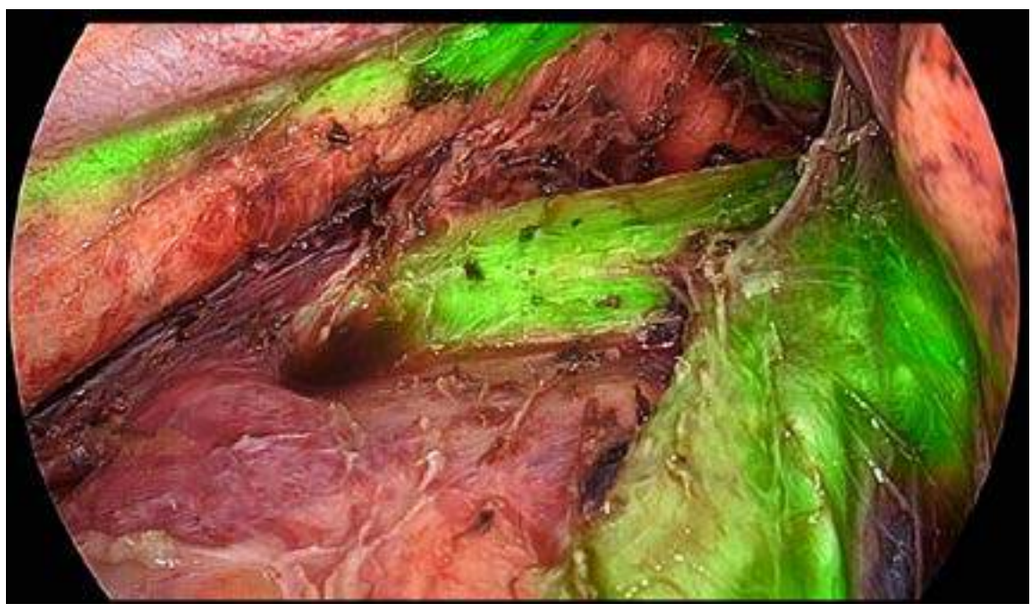


Figure 1 - Thoracic duct fluorescence imaging

2. Tracheobronchial fluorescence (ICG-TBF)

One of the pivotal moments in our journey with ICG was when we asked ourselves: what if we aerosolize

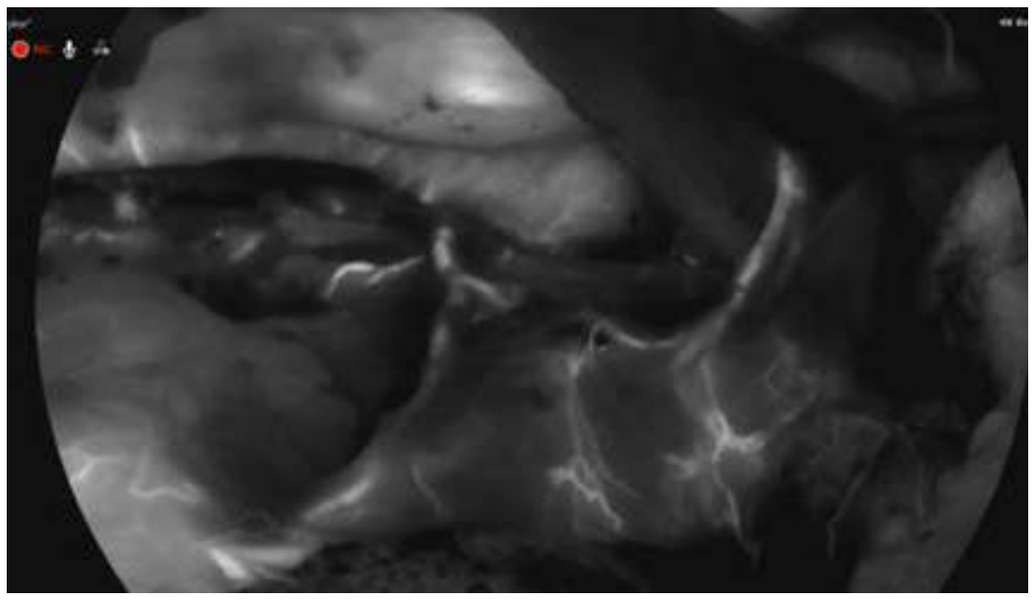
the ICG solution and deliver it through a nebulizer? We encountered a case in which the plane between the Oesophageal mass and the paper-thin membranous trachea was unclear because of dense post-radiation fibrosis. What followed in the subsequent months was the standardization of this novel ICG administration route. We changed how we assessed operability in advanced tumors by performing the ventral dissection first, mobilizing the esophagus off the trachea and left bronchus, and then dividing the mesoesophagus containing the Oesophageal blood supply. The greatest advantage of this maneuver was seen in salvage esophagectomies. Since our report, aerosolized ICG has also been evaluated in lung and rectal resections.



Tracheobronchial fluorescence (ICG-TBF)

3. Bronchial artery perfusion assessment

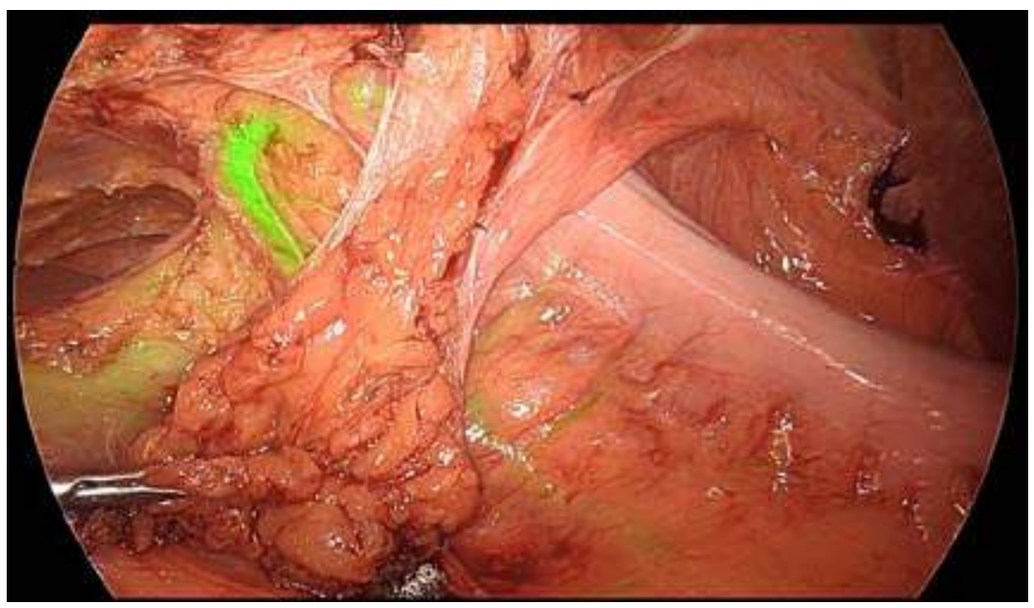
The most common morbidity following esophagectomy is pulmonary. We have long held the view that this is not merely a medical complication for which the surgeon bears no responsibility; on the contrary, the surgeon is a key factor in reducing this so-called medical complication. Preservation of the neurovascular bundle to the bronchi has been shown to improve postoperative ciliary function of the bronchial mucosa. Bronchial arteries are small, variable in number and position, and frequently give off branches to the subcarinal lymph node basin. With the prevalent use of modern energy devices, there is a risk of thermal injury, and mere anatomical preservation of these arteries may not be sufficient. This is why, in our unit protocol, assessing perfusion of the bronchial arteries and the vascular arcade over the membranous layer of the bronchi provides an important variable to document, study, and correlate with outcomes in patients with preserved versus compromised blood supply.



Bronchial artery perfusion assessment. Left bronchial artery seen crossing the subcarinal region and supplying right bronchus as well.

4. Right gastroepiploic pedicle identification

While mobilizing the stomach for gastric conduit creation, two specific scenarios may obscure the exact location of the gastroepiploic pedicle. The first is an obese abdomen, in which the pedicle is buried beneath layers of fat within the gastrocolic ligament. The second scenario is the presence of dense adhesions between the gastrocolic ligament and the anterior abdominal wall. In both situations, when uncertainty exists, ICG has helped us by highlighting the course of the pedicle and enabling safer dissection.



5. Gastric conduit perfusion assessment

As this is the oldest and most widely accepted application of ICG, much has already been reported and studied regarding its role. At the core of this application lies the anatomical fact that the right gastroepiploic pedicle typically extends only to about

Stomach and gastrocolic ligament found adherent to the anterior abdominal wall. Right gastroepiploic artery highlighted by fluorescence and safeguarded during adhesiolysis.

60–70% of the length of the gastric conduit. The distal portion depends on a submucosal blood supply that is highly variable among patients. We have encountered situations where the tip of the conduit appeared satisfactory to the naked eye, yet ICG demonstrated absent perfusion. Leaving such an anastomosis to chance without revising the conduit would be unacceptable to any surgeon. Intraoperatively, this may increase surgical effort, as further mobilization or secondary Kocherization of the duodenum may be required. However, as the saying goes: "If a challenge is solved on the table, it is complexity; if it is not solved on the table, it becomes a complication." In the not-so-distant future, fluorescence-guided surgery may carry medicolegal implications. In the information age, where AI chatbots are at the fingertips of every patient, serious postoperative complications are increasingly viewed through a magnifying lens. Surgeons working in hospitals with fluorescence-enabled systems who fail to document adequate vascularity of critical anastomoses may face consequences. The converse is equally true: documentation of critical steps using fluorescence guidance may provide the surgical team with its strongest defence.

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Top surgeons who transformed Oesophageal surgery

Ronald Herbert Robert Belsey, FRCS (1910–2007)

The Master of Frenchay: Conscience of Oesophageal Surgery

Early Life, Education, and Wartime Service

Ronald Herbert Robert Belsey was born on 2 April 1910 in London, the son of Herbert Robert Belsey, a dental surgeon. His childhood was defined by intellectual energy and athletic drive in roughly equal measure: educated at Woodbridge School in Suffolk, he excelled academically, was made head prefect in 1926, and distinguished himself across a wide range of sports. He won an entrance scholarship to St Thomas' Hospital Medical School in London, where he continued to thrive, playing rugby and ice hockey while pursuing his medical studies with characteristic seriousness. After qualifying with the conjoint diploma in 1934, he sat the London MB BS examination and won the coveted Beaney Prize for surgery with honours — the first indication of the extraordinary surgical mind that would shape the specialty for the next half-century.

His early postgraduate path was shaped by two pivotal experiences. Working as a house surgeon under Norman Barrett at St Thomas' — the man who would later give his name to Barrett's oesophagus — Belsey's interest in the oesophagus was first kindled. He then moved to the Brompton Hospital in London, then the national centre for thoracic surgery, serving as Resident Surgical Officer under prominent chest surgeons before being awarded a research scholarship that took him to Harvard Medical School in Boston. There, working alongside Edward "Pete" Churchill, he participated in the landmark study establishing pulmonary segments as the key anatomical unit of the lung — a contribution that fundamentally changed pulmonary surgery. Returning to England as the Second World War broke out, Belsey was posted to Frenchay Hospital near Bristol — a posting that, in retrospect, changed the history of Oesophageal surgery.

Frenchay Hospital: Building a World Centre

Frenchay Hospital, a sprawling wartime facility on the outskirts of Bristol, became the unlikely setting for one of the most productive surgical careers of the twentieth century. Belsey arrived during the war years as part of a US Army thoracic surgery unit, and when the war ended, he stayed — building the thoracic surgery programme from the ground up into a world-renowned centre of excellence. For more than three decades, Frenchay under Belsey became a pilgrimage site for ambitious thoracic and Oesophageal surgeons from across Europe and North America, drawn by the quality of his clinical judgment, the elegance of his technique, and the rigour with which he examined and reported his results. Among those who trained under him were Clement Hiebert, David Skinner, Arthur Baue, Mark Orringer, Joel Cooper, and Toni Lerut — surgeons who collectively shaped the trajectory of thoracic surgery on both sides of the Atlantic for the following half-century.

In an era when operative mortality from Oesophageal surgery regularly exceeded 20 to 40 percent at most centres, Belsey achieved results that were without parallel. His approach rested on meticulous technique, an unflinching insistence on operating only when conditions were optimal, and a deep scepticism of fashionable procedures that had not been subjected to rigorous long-term follow-up. A contemporary observer noted that Belsey had, in his own series, effectively eliminated the dreaded intrathoracic anastomotic leak — the principal killer in Oesophageal surgery — by consistently bringing the gastric anastomosis up into the neck where any leak could be safely drained. He could see no reason, he once remarked bluntly, to compromise those results through what he regarded as uncontrolled manoeuvres.

The Belsey Mark IV and the Conquest of Reflux

If Belsey's contributions to Oesophageal cancer surgery were defined by supreme technical discipline, his contributions to the surgical management of gastro-Oesophageal reflux disease were defined by systematic intellectual inquiry over decades. Disturbed by the poor results and high recurrence rates of existing anti-reflux procedures, Belsey set about studying the functional anatomy of the lower Oesophageal sphincter with a methodical patience that few surgeons of any era have matched. He developed, revised, and refined a series of anti-reflux operations — sequentially designated Belsey Mark I through Mark IV — each iteration representing a closer approximation of his understanding of what was physiologically required. The final form, the Belsey Mark IV fundoplication, involved a 270-degree partial wrap of the gastric fundus around the lower oesophagus through a left thoracotomy, restoring the gastro-Oesophageal junction to its correct anatomical position at least two to three centimetres below the diaphragm.

The Mark IV repair, described formally in 1967 in a landmark paper co-authored with Thomas DeMeester, became one of the standard operations for hiatal hernia and gastro-Oesophageal reflux disease, practiced widely across the world for decades. Its transthoracic approach gave the surgeon unrivalled access to the lower oesophagus, making it particularly valuable in patients with complicated or recurrent reflux disease and shortened oesophagi. Though the laparoscopic Nissen fundoplication has supplanted it as the procedure of first choice in the modern era, the Belsey Mark IV remains an essential operation for the management of complex reflux — particularly in redo surgery — and is taught in every comprehensive thoracic surgery training programme in the world.

Colon Interposition and Further Innovations

Belsey's technical innovation extended well beyond the anti-reflux operation that bears his name. He was an early and passionate advocate of colon interposition for Oesophageal reconstruction — the use of a segment of left hemicolon to replace a resected or destroyed oesophagus — and pioneered its use in patients with caustic strictures and long-segment Oesophageal disease, particularly in children. At a time when the technical and physiological challenges of colon interposition deterred most surgeons, Belsey approached the procedure with the same systematic patience that characterised all his work, developing a technique of notable reliability and durability. He also contributed to the surgical management of tracheo-Oesophageal fistula in neonates, congenital Oesophageal atresia, achalasia, Oesophageal diverticula, and Oesophageal perforation — in every domain bringing the same qualities of independent inquiry, technical precision, and honest scrutiny of results.

His international influence was exercised not only through his trainees but through his visiting professorships at universities across Europe and North America, his service as a frequent consultant at leading institutions including Baylor University Medical Center in Dallas, and his participation in the major surgical associations on both sides of the Atlantic. He travelled widely — and with characteristic purpose: one account recalls him operating on children with corrosive strictures of the gullet in Cairo, taking particular delight in applying his expertise where it was most needed and least available.

Character, Retirement, and Legacy

Those who trained under Ronald Belsey describe an experience that was simultaneously humbling and transformative. He was not, by all accounts, an easy master — he was demanding, direct, and famously frugal with sentiment, as one visitor discovered upon being accommodated in a small boarding house near Frenchay rather than a Bristol hotel. But he was also profoundly generous with his knowledge, scrupulously honest about the limits of his own technique, and deeply committed to the welfare of his patients above all professional considerations. He married Pauline May Tilbury in October 1941, and they had a family together; Pauline died in 2000. Outside the operating theatre, Belsey was a passionate fly fisherman — designing his own flies and fishing the Usk and the Dart with a contemplative precision that mirrored his surgical life — as well as an accomplished shot and collector of both long and short firearms. In retirement, he proved as purposeful as he had been in practice, advising his students to begin planning their retirement from the first day of their careers.

Ronald Belsey died in 2007 at the extraordinary age of 97, having lived long enough to see the discipline he had helped to found transformed beyond all recognition by the minimally invasive revolution — a revolution carried out in large part by the surgeons he had trained. He had trained approximately 45 international surgeons at Frenchay, each of whom went on to build or strengthen academic programmes in Oesophageal surgery across the world. The Belsey Mark IV fundoplication remains in daily use in surgical theatres across the globe. His approach to the

cervical anastomosis in Oesophageal resection — placing the join in the neck to eliminate the lethal intrathoracic leak — became one of the most important safety principles in the field. His insistence on long-term follow-up as the only valid measure of a procedure's worth was itself a methodological legacy as important as any technical one. In the full sweep of twentieth-century surgery, Ronald Belsey stands as one of the foundational figures of the modern management of Oesophageal disease — a gentleman-surgeon whose quiet authority, intellectual integrity, and uncompromising standards set the conscience of the specialty for a generation.

Why read this newsletter

This Sutra Volume 3 – Oesophagus Edition gives useful knowledge about oesophageal diseases and surgeries. It brings together expert ideas, real experiences, and the latest updates in surgical gastroenterology. It helps readers understand both basic and advanced concepts in a simple way.

CASE IN POINT

Robotic esophagectomy and 3-field lymphadenectomy with intraoperative nerve monitoring

Shravan S Nadkarni, Sabita Jiwnani, V Saiesh Reddy, Devayani Niyogi, Virendra Tiwari, George Karimundackal, C S Pramesh

Introduction

While surgery is the primary curative approach for Oesophageal cancer, the procedure carries significant risks, particularly when an extensive lymphadenectomy is required. A major concern during these operations is trauma to the recurrent laryngeal nerve (RLN). Reported injury rates vary widely—from 1% to over 45%—influenced largely by the severity of the malignancy and the aggressiveness of the nodal dissection. Damage to the RLN, whether through physical manipulation or thermal injury, can lead to severe postoperative complications, including:

- **Persistent hoarseness and vocal cord dysfunction.**
- **Increased risk of aspiration and pneumonia.**
- **The need for long-term interventions like tracheostomy or gastrostomy.**
- **Extended hospital stays and potentially fatal outcomes.**

To combat these risks, Intraoperative Nerve Monitoring (IONM) has emerged as a vital tool for real-time nerve identification and preservation. Although initially developed for thyroid and parathyroid surgeries, IONM is now frequently applied to complex Oesophageal resections, specifically 3-field lymphadenectomies. By providing physiological feedback during mediastinal clearance, IONM assists surgeons in navigating the delicate area around the RLN, significantly lowering the incidence of nerve palsy and its associated morbidities [1].

Patient Details

The patient is a 33-year-old female with an excellent performance status and no significant medical history. She presented with a two-month history of worsening weight loss and difficulty swallowing (dysphagia). An obstructing, ulcero-proliferative lesion was identified at the 30 cm mark with Endoscopy. Biopsy confirmed the diagnosis of a poorly differentiated squamous cell carcinoma. Staging via positron emission tomography (PET) revealed the following:

A mass located in the mid-to-lower third of the esophagus.

Involvement of the superior mediastinal lymph nodes, specifically within the left tracheOesophageal groove.

Following this diagnosis, the patient received neoadjuvant chemotherapy (carboplatin and paclitaxel) to which she responded very well. Consequently, she was scheduled for a robotic-assisted 3-field lymphadenectomy. The procedure utilized the Da Vinci Xi Surgical System (Intuitive Surgical Inc., Sunnyvale, CA, USA) integrated with intraoperative nerve monitoring (IONM).

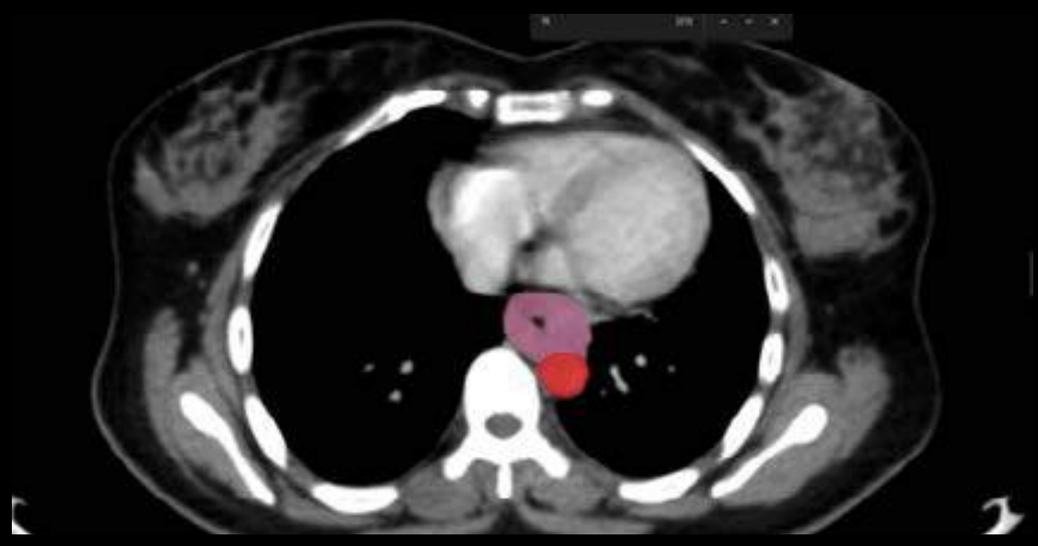


Figure 5 – Semi-prone patient position with port positions (C-

Camera 5th ICS, A- Assistant, X- working ports – 3rd & 7th ICS)

Figure 6 – Nerve monitoring equipment, endotracheal tube with surface electrodes for vocal cord electromyographic activity monitoring

Surgical Technique

Pre-chemotherapy imaging demonstrated a sizable lymph node in the left tracheOesophageal groove along with a tumor involving the mid-to-lower thoracic esophagus. Interval response evaluation revealed marked regression of the left tracheOesophageal groove lymph node and a significant treatment response at the primary tumor site. Imaging also identified an aberrant retrobronchial vessel with venous drainage into the superior pulmonary vein.

For lung isolation, a bronchial blocker (COOPDECH bronchial blocker, Daiken-Iki Corporation, Japan) was used in conjunction with a single-lumen electromyographic (EMG) endotracheal tube (NIM EMG endotracheal tube, Medtronic Xomed, Jacksonville, FL, USA). Capnothorax was established using carbon dioxide insufflation at a pressure of 6–8 mmHg. The procedure was performed with the patient in a semi-prone position, maintained at approximately a 30-degree tilt using an anteriorly placed bolster. Surgical access was achieved using three robotic ports and one assistant port. The camera port was positioned in the fifth intercostal space along the posterior axillary line at the level of the scapular angle, while the working robotic ports were placed in the third and seventh intercostal spaces. An assistant port located between the camera and inferior robotic port facilitated lung retraction, suctioning, and lymph node retrieval. This port configuration allowed completion of the procedure with only three robotic instruments, thereby reducing overall procedural cost.

Intraoperative nerve monitoring was conducted using the NIM

3.0 system (Medtronic Xomed), which generates real-time audiovisual feedback upon stimulation of the Vagus nerve or recurrent laryngeal nerve by converting laryngeal muscle activity into EMG signals. A specialized endotracheal tube embedded with stainless-steel electrodes was positioned such that the electrodes rested immediately superior to the vocal cords, with correct placement verified via direct laryngoscopy. Grounding electrodes were applied either over the shoulder or adjacent to the sternum. Effective nerve monitoring required avoiding neuromuscular blocking agents throughout anesthesia.

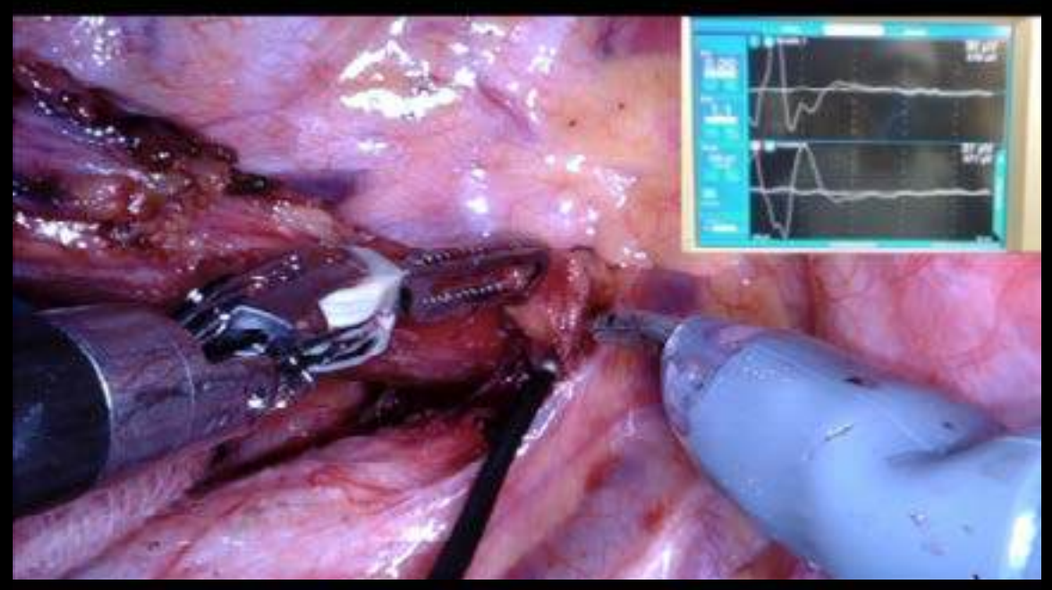
Thoracic Oesophageal mobilization is initiated using a conventional approach. Dissection begins with an anterior pleural incision at the level of the tumor to evaluate resectability and to separate the esophagus from the pericardium. This is followed by a posterior pleural incision, which is deliberately performed to maintain Oesophageal blood supply via the posterior aortic branches should the tumor be deemed unresectable. At this stage, the infracarinal segment of the vagus nerve becomes identifiable and is divided inferior to the right main bronchus to preserve vagal innervation to the trachea. The right bronchial lymph node from the subcarinal nodal group is carefully dissected away from the right main bronchus, with meticulous attention to avoid bronchial wall injury. Oesophageal dissection is then extended cranially until the azygos venous arch is encountered.

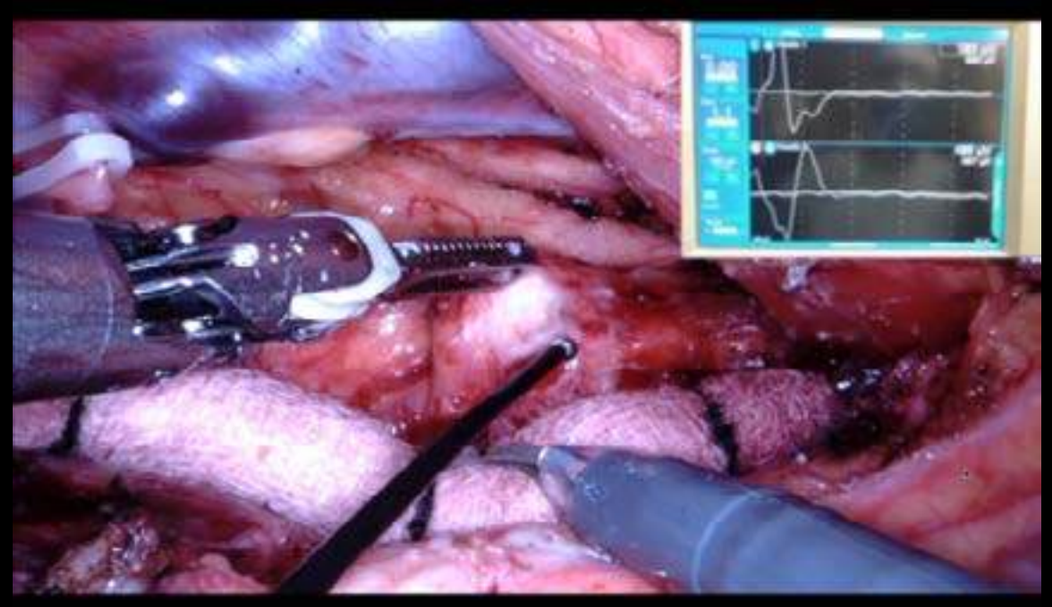
Mobilization of the esophagus above the level of the azygos vein is then undertaken. In this region, the anatomical relationships of the esophagus with the superior vena cava, as well as the phrenic and vagus nerves, are delineated. The pleura overlying the supra-azygous mediastinum is excised to expose both the esophagus and the trachea. The azygos vein is subsequently divided, with care taken to identify and protect the bronchial vessels, which typically course immediately beneath the vein and may require separate ligation. Dissection proceeds along the right main bronchus toward the trachea, with continuous efforts to prevent injury to these critical structures. Given the use of only two working robotic arms, a Mediflex traction suture (Mediflex Surgical Products, Islandia, NY, USA) is employed to retract the esophagus and facilitate continued mobilization.

Superior mediastinal lymph node dissection is continued with the removal of nodal tissue adjacent to the right recurrent laryngeal nerve. The nerve is identified, and its integrity is confirmed using a nerve monitoring probe that provides audiovisual feedback. Once the esophagus is retracted out of the operative field, gentle compression of the trachea allows visualization of the left recurrent laryngeal nerve nodal station. The left recurrent nerve is identified along with the surrounding lymphatic tissue, and its function is verified with nerve monitoring prior to meticulous dissection. Throughout this step, particular care is taken to avoid both thermal and mechanical injury to the nerve.

Nerve impulse demonstrated with a probe on the Right & left recurrent laryngeal nerve

Following completion of lymphadenectomy at the left recurrent laryngeal nerve station, neural integrity is reassessed using intraoperative monitoring. The left recurrent laryngeal nerve is then meticulously skeletonized along its entire course, extending





from its origin beneath the aortic arch up to the thoracic inlet. Dissection proceeds to include the removal of lymphatic tissue within the aortopulmonary window, located between the aortic arch and the left main bronchus, with the pulmonary artery

forming the inferior boundary. This is followed by excision of the left bronchial lymph node, which constitutes part of the subcarinal nodal basin.

The final component of the thoracic phase involves identifying, clipping, and dividing the tissue between the azygos vein and the anterior aspect of the aorta. This tissue plane contains the thoracic duct in the lower mediastinum, typically at or inferior to the level of the inferior pulmonary vein.

For the abdominal phase, the left hepatic lobe is elevated using a Nathanson retractor. The stomach is then mobilized by sequential division of the greater omentum while preserving the right gastroepiploic vascular arcade, followed by division of the lesser omentum. The left gastric pedicle is carefully dissected to expose the left gastric artery and vein, which are individually clipped and divided. A formal D2 lymphadenectomy is completed, after which the esophagus is freed circumferentially from both the right and left diaphragmatic crura.

Cervical access is achieved by first marking the suprasternal notch and planning bilateral curvilinear incisions approximately two finger breadths superior to the clavicles, extending across the sternocleidomastoid muscles. Each muscle is divided between its sternal and clavicular heads and retracted laterally. The deep cervical fascia is incised, and fibrofatty tissue lateral to the internal jugular vein, corresponding to nodal station 104, is excised with caution to avoid injury to the transverse cervical vessels and the thoracic duct, which is frequently encountered in this region. The great vessels are then gently retracted laterally to permit dissection of station 101 on the left, where the left recurrent laryngeal nerve is identified within the tracheOesophageal groove. The nerve is clearly visualized, preserved, and protected throughout the dissection, with nerve monitoring serving as a valuable adjunct for identification. An identical sequence is performed on the right side, including division of the sternocleidomastoid muscle and clearance of nodal stations 104 and 101.

The remaining steps of the operation—construction of the gastric conduit, pyloric dilation, and creation of a stapled esophagogastric anastomosis using the triangulation technique—are performed according to standard practice. A nasogastric tube is advanced into the conduit to provide adequate decompression and to reduce the risk of postoperative conduit distension.

The procedure was completed with an estimated blood loss of approximately 200 mL and a total operative time of nearly five hours. Postoperative recovery was uncomplicated, and preserved vocal cord mobility was confirmed on direct laryngoscopic examination. Final histopathological analysis demonstrated a complete pathological response, with no evidence of metastatic disease in any of the 42 retrieved lymph nodes. The patient remains under regular clinical surveillance.

Discussion

Open transthoracic esophagectomy has traditionally been regarded as the reference standard for the surgical management of Oesophageal carcinoma; however, it is associated with considerable perioperative morbidity, high complication rates, and non-negligible mortality [3,4]. With advances in surgical technology and refinement of operative techniques, minimally invasive esophagectomy has increasingly emerged as the preferred approach, largely due to a reduction in procedure-related complications [5–7]. In particular, robot-assisted thoracoscopic surgery offers several well-established technical advantages. Patients undergoing minimally invasive esophagectomy have also demonstrated superior health-related quality-of-life outcomes, including reduced postoperative pain and lower rates of constipation during the first 24 months following surgery, when compared with those treated using open techniques [8].

Oesophageal carcinoma is characterized by early and extensive lymphatic dissemination, with nodal involvement frequently extending to cervical, thoracic, and abdominal lymph node stations irrespective of the primary tumor location [6]. Consequently, the extent of lymphadenectomy should be tailored according to pre-treatment disease burden. In cases where supracarinal lymph nodes demonstrate metabolic activity on staging positron emission tomography (PET) imaging, a three-field lymphadenectomy is considered essential to optimize oncologic outcomes. Metastatic involvement of lymph nodes adjacent to the recurrent laryngeal nerve (RLN) has been reported in 18–43.4% of cases [9], and comprehensive mediastinal lymph node dissection in this region has been associated with improved five-year survival rates [10]. Furthermore, RLN nodal metastasis has been identified as an

independent prognostic determinant of treatment outcomes [11]. Despite these benefits, extensive lymphadenectomy is associated with increased procedural risk, including RLN injury, vascular complications, and postoperative chyle leakage.

Intraoperative nerve monitoring (IONM) is an adjunctive technique that facilitates RLN identification and minimizes inadvertent nerve injury, thereby reducing postoperative complications. One notable advantage of IONM is its ability to assist in nerve identification prior to direct visualization, which is particularly valuable in patients who have undergone neoadjuvant therapy. Changes in electromyographic (EMG) signals—specifically a reduction in amplitude exceeding 50% or prolongation of latency—may serve as early indicators of RLN injury [12]. A recognized limitation of IONM is its variable diagnostic accuracy; however, this may be mitigated through standardized protocols and adherence to procedural guidelines [13]. A recent systematic review and meta-analysis demonstrated a significantly lower odds of RLN palsy in patients undergoing surgery with IONM compared to those without monitoring (OR 0.33, 95% CI 0.12–0.88, $p < 0.05$), along with a significantly higher number of mediastinal lymph nodes retrieved (mean difference 4.30, 95% CI 2.75–5.85, $p < 0.001$). No statistically significant differences were observed in rates of aspiration, pneumonia, operative duration, or length of hospital stay [14].

Conclusion

Minimally invasive esophagectomy has become the treatment approach of choice for patients with Oesophageal malignancy, with comprehensive lymph node dissection performed in selected clinical scenarios. Given the risk of postoperative complications associated with lymphadenectomy in the vicinity of the recurrent laryngeal nerve, strategies aimed at mitigating nerve-related morbidity are essential. Intraoperative nerve monitoring has been shown to reduce the incidence of recurrent laryngeal nerve palsy while enabling more thorough lymph node retrieval; however, its efficacy and long-term impact require validation through well-designed, large-scale randomized clinical trials.

Link to the full surgical Video - https://mmcts.org/tutorial/1746

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The next issue of 'Sutra' will be a special one on 'portal hypertension'. Anyone interested in contributing to the issue can write to us

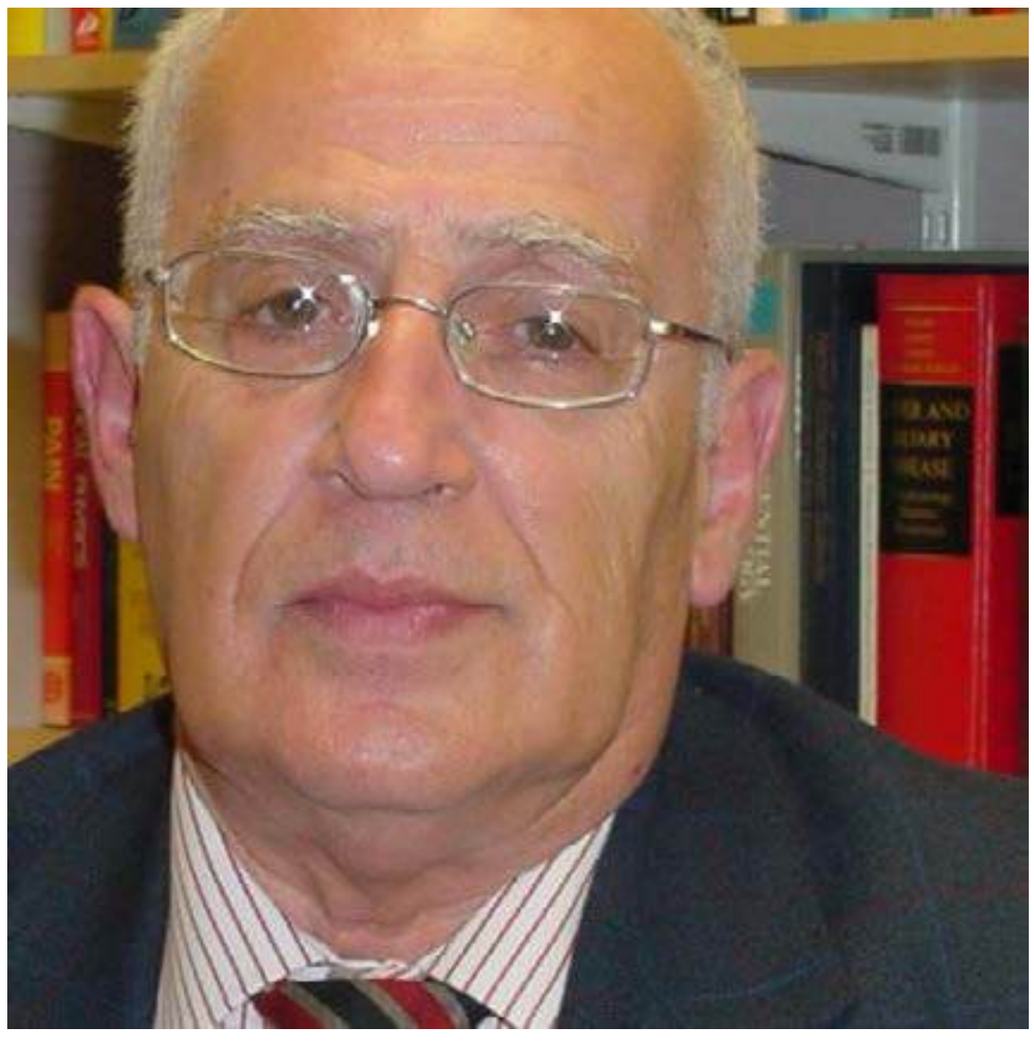
...Editorial Board

Top surgeons who transformed Oesophageal surgery

Professor Sir Alfred Cuschieri, FRSE FMedSci (born 1938)

Father of Minimally Invasive Surgery

Early Life, Wartime Malta, and Medical Formation



Alfred Cuschieri was born on 30 September 1938 in Valletta, Malta — an island then under sustained aerial bombardment by the Luftwaffe. His earliest memories were of crouching with his family in bomb shelters as the raids swept over the Grand Harbour, an experience that gave him, even as a young child, a vivid understanding of human vulnerability and survival. His father was of Italian Florentine descent and his mother Maltese, and the family's mixed Latin European heritage lent a particular intellectual and cultural energy to his upbringing. He showed exceptional academic promise from an early age and won a place to study medicine at the Royal University of Malta, where he graduated with his medical degree in 1961. The island's medical school offered a serious, demanding formation, but Cuschieri immediately understood that his ambitions would require him to seek the larger platforms of Britain's leading academic surgical centres.

Arriving in the United Kingdom shortly after graduation, he pursued further surgical training and research at the University of Liverpool — then one of Britain's most active centres for gastrointestinal surgery. It was during his years of clinical training in Liverpool that the observation which would define his entire career first crystallised in his mind. He watched elderly patients, many of them above the age of 70, die in the days and weeks after major abdominal surgery — not from their disease, but from the catastrophic respiratory consequences of enormous incisions that left them unable to breathe without agonising pain. Post-operative pneumonia, in an era of inadequate analgesia and enormous laparotomy wounds, was killing five to ten percent of surgical patients. When the young Cuschieri suggested to his professor that there must be a better way to operate — one that avoided these great incisions — he was told bluntly that surgeons who were afraid of blood and big incisions should not have entered the profession. He said nothing further. But he did not abandon the idea.

The Idea That Changed Surgery: Liverpool and the Road to Dundee

During summer vacations, the quietly determined Cuschieri wrote letters to a German professor and an Austrian professor — both engineers, not surgeons — who were working on the concept of operating through small incisions. He visited them on his own initiative, and what he found confirmed his conviction that the future of surgery lay in working through the smallest possible openings in the body's surface. A critical meeting followed with Professor Harold Horace Hopkins, the British physicist who had developed a revolutionary new type of rod-lens telescope with far superior optical resolution to anything then available — the instrument that would eventually become the laparoscope. Cuschieri recognised immediately that Hopkins' telescope was the enabling technology his vision required.

He rose to a Personal Chair in Surgery at Liverpool in 1974, and in 1976 he accepted the Professorship of Surgery and Chairmanship of the Department of Surgery and Molecular Oncology at the University of Dundee and Ninewells Hospital — a post he would hold with transformative effect for the next 27 years. Dundee proved the ideal platform for his ambitions. A city without pretension and open to ideas on their merits, it gave him the institutional support, the clinical volume, and the interdisciplinary collaborators he needed. With Professor

George Berci of Cedars-Sinai Hospital in Los Angeles as a key partner, and with a small company in Germany manufacturing purpose-built instruments, Cuschieri assembled what he later described as the best multidisciplinary surgical technology team in all of Europe.

The Birth of Keyhole Surgery and the Thoracoscopic Esophagectomy

In 1987, at Ninewells Hospital in Dundee, Cuschieri and his team performed the first minimally invasive operation in the United Kingdom — a laparoscopic cholecystectomy (gallbladder removal) through tiny incisions using a camera and purpose-built instruments — a procedure that would go on to become the most commonly performed abdominal operation in the world. The approach was initially met with significant scepticism and even alarm from elements of the surgical establishment; incidents of complications from surgeons inadequately trained in the new techniques led to public concern. Cuschieri's response was characteristically systematic: he established one of the first dedicated surgical skills training units in the world at Dundee in 1990, the forerunner of training infrastructure that is now standard in every major surgical centre globally.

His contribution to Oesophageal surgery specifically came in 1992, when Cuschieri, together with colleagues Shimi and Banting, performed and published the world's first thoracoscopic esophagectomy — the removal of the oesophagus using a video camera and instruments inserted through small ports in the chest wall, without a thoracotomy incision. The landmark paper, published in the Journal of the Royal College of Surgeons of Edinburgh, described endoscopic oesophagectomy through a right thoracoscopic approach and announced to the surgical world that one of the most invasive and feared operations in all of surgery could, in principle, be accomplished through the smallest of incisions. Traditional open oesophagectomy carried complication rates as high as 60 percent and mortality rates of up to 10 percent; the promise of the thoracoscopic approach was a dramatic reduction in the respiratory and wound complications that drove this toll. A subsequent series of 26 thoracoscopic oesophagectomies reported by Cuschieri in 1994 demonstrated zero operative mortality — a result that reinforced the procedure's potential and opened the door to the fully minimally invasive oesophagectomy that James Luketich at UPMC would develop and popularise over the following decade.

Technology, Robotics, and the Institute of Medical Science

From the outset, Cuschieri understood that the minimally invasive revolution was not simply a surgical technique but an engineering and technology challenge. He led a research programme that developed novel instruments, devices, and access systems for minimal access surgery, accumulating 58 European and US patents as principal investigator — an extraordinary figure for a clinical academic. His laboratory investigated ergonomics and image display in endoscopic surgery, demonstrating in landmark studies that the location of a monitor directly affects a surgeon's performance — findings that shaped the design of every modern operating theatre in the world. He pioneered the use of shape memory alloys in surgical instruments, explored nanotechnology and nanoscience as platforms for targeted drug delivery and cancer treatment, and co-developed the Dundee EndoCone — an early single-port laparoscopic access system that prefigured the single-incision surgical techniques now widely practiced.

In 2003, Cuschieri was appointed Professor of Surgery at the Scuola Superiore Sant'Anna in Pisa, Italy, adding a European academic base to his continued work at Dundee. He helped establish the Institute of Medical Science and Technology (IMSaT) at Dundee — a unique facility bridging clinical surgery, engineering, materials science, and computing — and became its Chief Scientific Advisor in 2008. There, his team turned to robotic surgery, artificial intelligence, and augmented reality systems for surgical skills training: a man who had begun his career watching patients die of pneumonia after enormous incisions was now, in his eighties, working on miniature robots designed to search for cancer inside patients' intestines.

Scholarship, Honours, and Legacy

The scope of Cuschieri's academic output is formidable: more than 600 peer-reviewed publications attracting over 56,000 scholarly citations, alongside more than 20 textbooks spanning laparoscopic surgery, biliary surgery, Oesophageal surgery, gastrointestinal oncology, and the five editions of Essential Surgical Practice — the definitive general surgical textbook for a generation of British and Commonwealth trainees. He has served as European Editor-in-Chief of Surgical Endoscopy and on the editorial boards of ten further peer-reviewed journals. His honours are commensurate with his contributions: he was knighted in the 2001 New Year Honours for services to medicine and surgery; elected a Fellow of the Royal Society of Edinburgh (FRSE) and a Fellow of the Academy of Medical Sciences (FMedSci); awarded the

Moynihan Medal by the Association of Surgeons of Great Britain and Ireland; made an Honorary Member of the American Surgical Association for seminal contributions to surgical science; and received the International Steven Hoogendijk Prize for outstanding contributions to medical technology in 2012.

Sir Alfred Cuschieri's legacy is, at its core, the legacy of a man who refused to accept that surgical trauma was an inescapable cost of surgical cure. From the bomb shelters of wartime Malta to the operating theatres of Dundee, from the instrument workshops of Germany to the robotics laboratories of Pisa, he pursued a single animating vision with a consistency and a courage that changed medicine permanently. The keyhole surgery revolution he helped ignite — now performed hundreds of millions of times annually across every surgical specialty worldwide — has reduced post-operative pain, shortened hospital stays from weeks to days, and saved countless lives from the complications of large surgical wounds. Within Oesophageal surgery specifically, his 1992 thoracoscopic esophagectomy opened the door to the minimally invasive revolution that would transform the treatment of one of medicine's most feared malignancies. He is, without question, one of the most consequential surgeons of the twentieth and twenty-first centuries.

A humble request from the editors…

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HOT OFF THE PRESS 1

"Neoadjuvant chemoradiotherapy followed by active surveillance versus standard surgery for Oesophageal cancer (SANO trial): a multicentre, stepped-wedge, cluster-randomised, non-inferiority, phase 3 trial"

Van der Wilk et al., Lancet Oncology, March 2025, DOI - 10.1016/S1470-2045(25)00027-0

Background

Neoadjuvant therapy is the standard of care for locally advanced Oesophageal cancer. A substantial portion of patients (nearly 25% of adenocarcinoma and 50% of squamous cell carcinoma(SCC)) achieve a pathologically complete response(pCR) after therapy. As many as 30% of patients develop early distant metastases following surgery, raising questions about the universal benefit of routine esophagectomy in all responders. Given the morbidity of esophagectomy, the option of organ-sparing active surveillance after a clinical complete response (cCR) has gained attention. Existing evidence supporting such a wait-and watch (WW) approach is limited to retrospective series, which suggest similar overall survival(OS) when compared to standard surgery. The preSANO trial established the safety and accuracy of clinical response evaluation of Oesophageal cancer following neoadjuvant chemoradiotherapy (nCRT).

Core Issue addressed

-In individuals with cCR after nCRT, does active surveillance (and postponed esophagectomy in case of local regrowth) provide similar overall survival as standard surgery?

-Does active surveillance provide a better health-care related quality of life (HRQOL) in these patients, without compromising oncological outcomes

Methodology

-Study Design – Multicentre (12 Dutch high-volume Oesophageal surgery centres), stepped-wedge, cluster randomised, non-inferiority, phase 3 clinical trial.

- **Initial phase: All 12 hospitals performed standard surgery**
- **Sequential transition: Clusters of 2 hospitals switched to active surveillance every 3 months via concealed computer-generated sequences**

-Patient Selection

- **Inclusion Criteria: Adults with locally advanced carcinoma of esophagus or gastrOesophageal junction, treated with curative intent with nCRT according to CROSS regimen, who achieved cCR. Patients from the pre-SANO trial were also included in the standard surgery group.**
- **Exclusion Criteria: Non-FDG-avid primary tumour at baseline PET-CT and patients initially treated with endoscopic resection**

-Study Protocol

onCRT: 5 weekly cycles of paclitaxel and carboplatin with concurrent external beam radiotherapy (41.4 Gy)

- **Clinical Response Evaluation**

- First evaluation - 6 weeks post nCRT
- Endoscopy with atleast 4 bite-on-bite biopsies
- Second evaluation - 12 weeks post nCRT- to diagnose cCR
- PET-CT scan with assessment of distant metastases
- Endoscopic ultrasound(EUS) with fine-needle aspiration (FNA) of suspected lymph nodes
- Endoscopy with ≥4 bite-on-bite biopsies
- Definition of cCR: No distant metastases, no vital tumour cells on biopsies, traversable lumen on endoscopy
- Provision for central pathology review and independent consensus in case of contentious cases
- Minimum follow up 2 years

- **Active surveillance schedule**

- PET-CT, EUS-FNA and biopsies every 3 months (year 1), 4 months (year 2), 6 months (year 3), and annually thereafter.
- Surgery triggered confirmed or highly suspected locoregional regrowth or no-pass on endoscopy, without metastases.

o Outcomes

- Primary Outcome: OS from date of cCR (second evaluation)
- Secondary Outcomes: Disease-free survival(DFS), locoregional recurrence, distant metastases, operative outcomes, HRQOL (EORTC QLQ-C30) and cost-effectiveness

-Statistical analysis

o Sample size – 740 participants (anticipating 75% 2 yr OS for standard surgery, non-inferiority margin of 15% worse survival, 34% cCR rate and inclusion of 29 participants from preSANO trial).

o OS and DFS - Kaplan-Meier method and compared mixed-effects Cox regression models

o Modified intention to treat analysis (ITT) allowed cross-over at time of cCR

o Sensitivity analysis including ITT and per-protocol

o Non-inferiority testing: One-sided 95% confidence boundary

Results

After screening 1115 patients, 776 were enrolled into the study after nCRT. 274 patients (35%) achieved cCR. With 35 preSANO patients added, 153 were assigned to surgery and 156 to active surveillance. After crossovers, modified ITT included 111 surgery vs 198 surveillance patients. Baseline characteristics were balanced between groups, and approximately 45% were adenocarcinoma and 52% squamous cell carcinoma. Median overall follow up was 38 months, with 34 months in the active surveillance arm and 50 months in the surgery arm. 2 year OS in active surveillance arm was 74% vs 71% in the standard surgery arm (modified ITT). Median OS was 43 months for active surveillance vs. 53 months for surgery (HR 1.14, p=0.55). Non-inferiority was confirmed across modified ITT and ITT analyses. There was no statistically significant difference in DFS (median DFS: 35 months for surveillance vs. 49 months for surgery, HR: 1.25, p=0.29). 17% patients of patients in the active surveillance arm were detected to have distant metastases before surgery could be offered, majority at the 6 months evaluation. The total distant dissemination rate was 43% at 30 months follow-up, vs 34% in standard surgery group (OR 1.45, p=0-18).

In the active surveillance arm, 35% had persistent cCR and avoided esophagectomy, while 48% developed locoregional regrowth needing surgery. 101 patients in the standard surgery arm underwent immediate surgery. Major morbidity rate was 84% and the 90-day mortality was 5%, both comparable to those of the postponed surgery group. R0 resection rate for salvage esophagectomy was 96%, similar to immediate surgery (98%). Active surveillance showed statistically and clinically significant improvement in global HRQOL assessed at 6 and 9 months, while the difference dissipated by 12 months.

Commentary

The Surgery As Needed for Oesophageal cancer (SANO) trial is a landmark study which fundamentally challenges the standard surgical paradigm in locally advanced Oesophageal cancer. The trial demonstrates the non-inferiority of active surveillance after cCR to routine surgery at 2 years. However, interpretation requires a certain degree of caution. The median follow up time provides limited evidence for durable non-inferiority and late recurrences could fundamentally alter survival curves. Interestingly, the median follow-up in the surveillance arm is markedly shorter than for the surgery arm and could potentially compromise head-to-head comparison. Although similar results were seen with DFS and distant dissemination rate, the results were numerically worse with surveillance and this difference could potentially become significant with longer follow-up. The authors argue that this maybe a reflection of the more intense surveillance protocol in this arm vs standard postoperative surveillance resulting in earlier detection of asymptomatic disease.

The SANO trial was largely based on experience acquired from the preSANO trial, which established the accuracy of multi-modal clinical response evaluation with 90% detection of residual tumours. It goes without saying that patient compliance is paramount, requiring adequate motivation for organ preservation despite surveillance burden. Clinical response evaluation, while rigorous, still carries a false-negative risk as high as 13.5%. In preSANO this was reduced to 5.4% with the addition of detection of circulating tumour DNA (ctDNA) detection, but this was not adopted in SANO. Nearly half the surveillance cohort developed isolated locoregional growth, highlighting the need for refinement

of response assessment strategies, and use of superior regimens of nCRT. Specifically, the role of immunotherapy needs to be studied, as their use has been reported favourably since the finalisation of the SANO protocol.

The study's pragmatic design addresses the challenges to randomising surgical and non-surgical strategies and was able to achieve a large sample size. Institution level randomisation does carry with it some selection bias when compared to patient-level randomisation, since participants may choose centres and vice-versa, based on the treatment offered. Although restricted referrals were disallowed, this bias cannot be excluded. The statistical methodology is robust and modification to allow crossover in modified ITT analysis appropriately handles real-world treatment selection, albeit reducing the power. The inclusion of non-randomised participants of the pre-SANO trial adds heterogeneity to the treatment groups, although the authors consider this a minor effect as the numbers were small. They note that the post-hoc sensitivity analysis after exclusion of this subset concurred with the primary analysis.

The obvious benefit of active surveillance is for those with persistent cCR (more than a third of patients in this study) who, thereby, avoid a morbid surgery. Among those who did develop regrowth, nearly 95% were amenable to curative salvage surgery. The feared complications of postponed esophagectomy after nCRT were also disproven, with equivalent operative outcomes and post-operative complications when compared to immediate surgery. Avoiding surgical complications is directly translated to a better short-term QOL among these patients. The EORTC questionnaire response rates were quire variable, however, and there was significant missing data. Another significant benefit of surveillance is the unmasking of disease biology and potentially avoiding surgery in patients with risk of early metastases. Assuming early systemic recurrence (within 6 months of completion of nCRT) reflects subclinical disease present at time of diagnosis, 46% (91 of 198) patients were spared potential futile esophagectomy.

The study included all cases of Oesophageal cancer, regardless of histological type. It can be argued that the benefit of neoadjuvant therapy, particularly RT may be for SCC, which typically demonstrates higher rates of pCR. The authors argue that in the setting of cCR, the efficacy of surveillance is unlikely to be affected by tumour type, and that two thirds of those achieving persistent cCR had adenocarcinoma, with similar OS. Whether these findings extend to patients treated with alternative neoadjuvant regimens (FLOT, immunotherapy-enhanced protocols) remains unproven. Incorporating biological markers like ctDNA or PDL1 expression may refine future patient selection for WW strategies.

The SANO trial draws parallels with rectal cancer where WW after nCRT for cCR has become increasingly accepted, and the paradigm shift from mandatory surgery to selective surveillance took more than 10 years of accumulating evidence. SANO provides compelling early evidence supporting organ-preserving strategies in Oesophageal cancer but long-term data are essential before widespread guideline adoption. Time, as they say, will truly tell.

Implications for Practice

-Active surveillance maybe a valid option in carefully selected patients achieving cCR, provided rigorous surveillance protocols and high institutional expertise are available.

-The study provides a framework for patient counselling and shared decision making incorporating surgical morbidity, patient preferences, and acceptance of increased surveillance burden.

Take-home points

-Active surveillance is non-inferior to surgery at 2 years for patients with locally advanced Oesophageal carcinoma who achieve cCR post-nCRT. Long term oncological equivalence remains uncertain.

-Salvage esophagectomy is feasible, with R0 resection rates and morbidity comparable to immediate surgery

-Short-term HR-QOL is superior in patients under active surveillance, largely due to avoided or delayed surgery.

HOT OFF THE PRESS 2

Intraoperative Nerve Monitoring during Minimally Invasive Esophagectomy and 3-Field Lymphadenectomy: Safety, Efficacy, and Feasibility

Gopinath SK et al, Journal of Chest Surgery, 2023;56(5):336-345, DOI - 10.5090/jcs.23.052

Background

Esophagectomy with radical lymphadenectomy is the cornerstone of treatment for Oesophageal cancer, and the current standard of care is minimally invasive esophagectomy (MIE) via thoracoscopy (VATS) or robotic-assisted approach. Three-field lymphadenectomy involves systematic dissection of lymph nodes along the bilateral recurrent laryngeal nerves (RLNs), particularly in the mediastinum and neck regions. It remains underutilised, despite evidence suggesting superior survival compared to standard 2-field dissection, mainly due to the substantial risk of RLN injury (ranging from 20% to 50%). The role of intraoperative nerve monitoring (IONM) is not as well demonstrated in Oesophageal surgery, as it has been in thyroidectomy. Recent literature, primarily from Japan, has reported promising results using IONM to reduce vocal cord paralysis rates. The feasibility and efficacy of IONM during MIE with extensive 3-field lymphadenectomy has not been clearly established, particularly for robotic-assisted procedures.

Core Issues Addressed

-Is IONM safe and feasible during MIE with 3-field lymphadenectomy and what are the technical and anesthetic modifications required for successful IONM implementation in MIE?

-Can IONM reduce the incidence of RLN paralysis when performing 3-field lymphadenectomy?

-Does use of IONM result in improved nodal yield, potentially allowing more complete lymphadenectomy?

Methodology

-Study Design - Single centre retrospective cohort study from Tata Memorial Hospital, Mumbai

- **IONM group(2020-2022) vs. historical non-IONM control group (2015-2020)**

-Patient selections

- **Inclusion Criteria: Adult patients with locally advanced Oesophageal or GE junction carcinoma planned for MIE (transthoracic esophagectomy with neck anastomosis)**
- **Exclusion Criteria: Non-FDG-avid primary tumour at baseline PET-CT, initial treatment with endoscopic resection, fixed vocal cord on preoperative assessment (institutional protocol)**

-Study protocol

- **Anesthesia protocol**

- NIM Contact-Reinforced electromyographic (EMG) endotracheal tube for recording EMG responses from vocal cords bilaterally
- Single dose of intermediate-acting neuromuscular blocker for intubation only and minimal to no neuromuscular blockade during the procedure (nil during cervical dissection phase)
- Maintenance with propofol infusion and sevoflurane
- Use of topical lignocaine applied to tracheal mucosa
- IONM Equipment and Settings
- Monopolar stimulation using short (100 mm) or long (175 mm) ball-tip probe with EMG recording on NIM-Response 3.0 monitor
- Surgical Technique:
- VATS or robotic approach as per surgeon preference – standard positioning and port placement
- Intermittent nerve monitoring employed: bilateral signals tested before and after each dissection segment at same anatomic location and stimulation amplitude
- Vagus and RLN integrity monitored during thoracic dissection
- Separate assessment during cervical dissection. Muscle

- relaxants entirely avoided during cervical dissection
- Surgical endopoint - 3-Field Lymphadenectomy
- Thoracic: Mediastinal nodes, right and left RLN nodal stations
- Cervical: Bilateral cervical para-Oesophageal nodal stations
- Abdominal: Gastric lesser curvature, left gastric, celiac axis stations

o Postoperative Assessment: Vocal cord evaluation via indirect laryngoscopy between postoperative days 3-7

-Statistical Analysis

o Continuous variables: means ± standard deviations

o Categorical variables: counts and proportions

o Comparisons: Independent t-test, Fisher exact test, or chi-square test as appropriate

Results

24 patients were included in the IONM Group. 18 underwent 3-field lymphadenectomy, 5 underwent total mediastinal lymphadenectomy and one underwent extended 2-field lymphadenectomy. Mean age was 53 years and 95.8% had squamous cell carcinoma. Half the tumours were in the middle third, and the other half in the lower third of the esophagus. 95% were stage II at diagnosis. All patients received neoadjuvant therapy, with 80% treated with chemotherapy and the rest receiving concurrent chemoradiotherapy. 15 patients underwent VATS esophagectomy and 9 underwent robotic MIE. 44 patients were identified as historical controls, 35 of which underwent VATS and 9 robotic MIE. Baseline characteristics were well-balanced between groups and there were no significant differences in tumour location, histology, tumour stage, or nodal involvement. More patients in the IONM group were treated with chemoradiotherapy(20.8% vs. 0%).

The IONM procedure involved successful RLN identification in all 24 patients. 23 of 24 patients (95.8%) maintained bilateral nerve signals throughout the surgery while 1 patient had loss of signal at the end of procedure. The IONM group required more operative time (mean difference ~50 min), however there was no difference in postoperative ICU stay or total hospital stay. Eight patients in the IONM group developed unilateral vocal cord paralysis (VCP) in the first post-operative week, 7 of which improved with conservative management and one required a tracheostomy. Seven among these had intact signals on IONM at the end of surgery. Immediate postoperative VCP was documented in 26 (59.1%) of the control group, accounting for an absolute reduction of 25.8% with IONM and a relative risk reduction of 43.6% (p=0.08). The tracheostomy rate was numerically lower in IONM group (4.2% vs. 13.6, p=0.42), as was the requirement of bronchoscopy (8.3% vs. 22.7%). There was no reported mortality in either group and no significant difference in incidence of other postoperative complications. The IONM group demonstrated 5.6 additional nodes harvested on average (p=0.04), representing approximately 14.4% higher nodal yield. Nodal positivity was 50% (12 of 24 patients) in IONM group, with the station 1 and 101r being most common. 41.6% of these had positive nodes along RLN stations, including 3 of the 8 patients who went on to develop postoperative VCP.

After a median follow up of 12.5 months, 6 out of the 8 (75%) patients with initial VCP in the IONM group recovered normal voice and the patient who underwent tracheostomy was successfully decannulated with recovery of normal voice and swallow. One patient had permanent VCP at 6 months follow up. In the control group, 17 patients (38.6%) reported return to normal vocal function at a median follow up of 22 months. 4 developed permanent VCP. 22 of the 24 IONM remained alive and disease-free at time of publication and 2 patients experienced systemic relapse and expired.

Commentary

This study from a high-volume Indian Oesophageal cancer centre represents their early institutional experience with IONM during MIE with 3-field lymphadenectomy. It supports the use of IONM during MIE, and is the first study to demonstrate its feasibility during robotic esophagectomy. The technical protocol has been detailed rigorously with emphasis on standardised equipment and clear parameter settings for monitoring at every step of the surgery. The authors have enumerated various procedural challenges they encountered and offer practical recommendations, and provide a reproducible protocol for other centres. The

technique was successful, with 100% RLN identification and reliable signal preservation without technical failure in almost all patients, supporting its feasibility and safety. This may be particularly valuable for variant anatomy, re-operations or high nodal burden. The anesthesia protocol has also been specified in detail, with emphasis on muscle relaxant minimisation, anaesthetic drug selection and titration strategies. This directly addresses the concern of interference by neuromuscular blockade, which has been a key barrier to the adoption of IONM. The utilisation of IONM was associated with comparable postoperative, with similar hospital stay and no unexpected adverse effects attributable to the IONM technique. Importantly, the use of IONM led to a significantly higher nodal yield, with an average of 5.6 additional nodes harvested. This suggests improved surgical confidence and completeness of dissection when nerve location is known. There is however, no reported disease-free survival data in this manuscript, and the population is predominantly those with squamous cell carcinoma. The presence of different tumour biology and nodal metastasis patterns may affect outcomes.

The study reflects the outcomes of a team experienced with 3-field lymphadenectomy. The results may not be generalisable to lower-volume centres or different healthcare systems. Even in their hands, the incidence of RLN palsy remains quite high despite IONM, with one-third of patients developing VCP; significantly higher than most contemporary series. This questions the utility of IONM if unable to prevent paralysis, especially when the practice of 3-field lymphadenectomy is not universal. The authors suggest their high VCP rate may be due to selection of patients with high nodal burden (50% nodal positivity), learning curve and small sample size. The paper defines VCP as findings on routine laryngoscopy within the first postoperative week, and not defined by symptoms. Routine screening (as done here) identifies subclinical paralysis and may explain higher VCP rates than in literature. A critical finding is that among those who developed VCP, 87.5% had intact bilateral RLN signals at the end of surgery. This indicates that IONM sensitivity for detecting functional impairment is low (sensitivity 66.7%). It can also be inferred that majority of paralysis represents neuropraxia rather than transection and IONM is unable to predict or prevent neuropraxia-type injuries. The use of intermittent nerve monitoring vs continuous, may miss early warning signs of impending neuropraxia and evolving traction injuries. The study does report a better VCP recovery rate in the IONM group (75% vs 38.6%) despite a shorter median follow-up duration (12.5 months vs 22 months), possibly reflecting higher proportion with permanent damage in the non-IONM group.

An important consideration is, of course, the limited cohort size. Statistical significance could not be achieved (p=0.08) despite an impressive absolute reduction in VCP rate (25.8 percentage points). The study was likely underpowered to reach the significance threshold for the primary endpoint. The retrospective historical control design carries significant selection bias and possible inaccuracy of data collection and completeness. The extent of lymphadenectomy in the non-IONM group is not explained, nor the postoperative laryngoscopy protocol, and there is missing follow-up data in the control cohort which could affect the results. The 5-year temporal gap between the groups allows for the effect of evolution of surgical technique and improvement in learning curves. There has also been considerable change in neoadjuvant protocols over the 5-year span, including the more widespread utilisation of radiotherapy in the IONM group. The authors do acknowledge that a randomised design would have been ideal, but indicate their choice was due to practical infeasibility. The small sample size also makes further analysis for risk prediction or stratification futile.

The IONM protocol calls for minimisation of neuromuscular blockade, which is a significant departure from standard anesthetic practice. This requires a coordinated surgeon-anesthesiologist-neurophysiologist team and carries potential risks of spontaneous breathing, coughing and patient movement. This may hinder its adoption across other centres. The technique also requires use of special EMG electrode-embedded endotracheal tubes which must be ordered specifically and may not be universally available. The use of this and other dedicated IONM equipment, along with neurophysiology expertise and training, make this an expensive undertaking. The cost-effectiveness of IONM remains unproven and economic analysis is needed to support adoption decisions in resource-limited settings.

IONM for RLN monitoring in esophagectomy has evolved

substantially from its initial description in 2001. Literature reports mixed efficacy, with the most recent meta-analysis of 11 studies showing significant reduction in VCP with IONM along with higher nodal yield. The authors have added to the evidence base and have demonstrated "feasibility" of IONM in MIE, but have not convincingly addressed true clinical efficacy or superiority. Hence, they have not made the case for recommendation for adoption. Most evidence-based global guidelines still do not recommend routine 3-field lymphadenectomy for Oesophageal cancer. For centres primarily carrying out 2-field dissection, IONM is less clearly indicated as cervical dissection is not routinely performed. It may be valuable for select cases (imaging-positive cervical nodes) and implementation may therefore, not be prioritised. Incorporation of machine-learning algorithms to interpret EMG signals and predict neuropraxia vs transection, as well as provision for real-time alerts for impending injury patterns may be useful directions for future research. Further large-scale randomised trials are needed to definitively establish clinical benefit of IONM over visual inspection, and determine optimal implementation strategies. At present, IONM should be considered an adjunct to visual inspection and anatomic knowledge, and not be viewed as panacea for preventing neuropraxia-type injuries or a replacement for fundamental surgical technique and expertise.

Implication for practice

- IONM is most applicable to high-volume centres performing MIE with routine 3-field dissection, with access to specialized equipment and expertise. IONM aids RLN identification and may enable more complete lymphadenectomy, especially in cases of high nodal burden. Effort and cost of implementation of IONM may be offset by increased nodal yield and marginal VCP reduction.

- For lower-volume centres, investment in IONM requires significant institutional commitment and comes with a steep learning curve. Adoption of IONM should follow mastery of basic 3-ield technique.

- Majority of RLN paralysis represents neuropraxia; IONM confirms anatomic integrity but cannot prevent all physiologic dysfunction.

Take home points

1. IONM during MIE is safe and technically feasible in both VATS and robotic platforms. Anesthetic modifications required for IONM are manageable without significant safety concerns.

2. IONM demonstrates potential to reduce RLN paralysis rates (26% absolute reduction)

although the study fails the conventional significance threshold.

3. IONM is associated with higher nodal yield without increasing post-operative morbidity, compared to visual inspection alone.

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Top surgeons who transformed Oesophageal surgery

Thomas W. Rice, MD

Architect of Oesophageal Cancer Staging

Education, Formation, and the Engineer Who Became a Surgeon

Thomas W. Rice occupies a unique position in the modern history of Oesophageal surgery: he is at once a gifted clinical surgeon, a methodologist of rare precision, and the principal architect of the staging system by which Oesophageal cancer is classified and treated worldwide. His path to medicine began through an unlikely discipline: he completed a Bachelor of Applied Science in Mechanical Engineering at the University of Toronto in 1974, acquiring a rigour in quantitative reasoning and systems analysis that would distinguish his academic work throughout his career. He then enrolled in medicine at the University of Toronto Faculty of Medicine, graduating with his MD in 1978. An internship at St. Michael's Hospital in Toronto was followed by his surgical residency in the Gallie Surgical Programme at the University of Toronto from 1979 to 1983 — one of Canada's most competitive general surgical training pathways. A cardiovascular research fellowship at the University of California, San Francisco from 1983 to 1984 and a thoracic and cardiovascular surgery fellowship back at the University of Toronto from 1984 to 1986 completed his formation.

In 1986, Rice joined the Department of Thoracic and Cardiovascular Surgery at the Cleveland Clinic as a staff surgeon — an institution whose culture of rigorous data collection, multidisciplinary research, and outcome measurement proved a perfect match for his temperament and training. By 1988, he had assumed leadership as Head of the Section of General Thoracic Surgery, a position that gave him both clinical authority and a research platform of national scope. He was appointed Professor of Surgery at the Cleveland Clinic Lerner College of Medicine at Case Western Reserve University in 2005, and the same year was awarded the Daniel and Karen Lee Chair in Thoracic Surgery — one of the most distinguished endowed chairs in American thoracic surgery.

Clinical Excellence at Cleveland Clinic

Over nearly four decades at the Cleveland Clinic, Rice built a clinical programme of remarkable breadth and quality. His surgical expertise spans the full spectrum of Oesophageal disease: Oesophageal cancer, achalasia, hiatal hernia and gastro-Oesophageal reflux disease, Oesophageal diverticula, Oesophageal perforation, and all forms of benign and malignant disease of the esophagogastric junction. He developed particular expertise in the surgical management of complex and recurrent hiatal hernia, the Collis gastroplasty for shortened esophagus, and multimodal approaches to locally advanced Oesophageal cancer combining neoadjuvant chemotherapy, radiotherapy, and surgical resection. His operative series at Cleveland Clinic stands as one of the largest and most carefully documented in the world. The Cleveland Clinic's thoracic surgery programme, which Rice helped shape across his tenure, is consistently ranked among

the very best in the United States.

The Worldwide Oesophageal Cancer Collaboration: Rewriting the Staging Manual

Rice's most far-reaching contribution to medicine was the creation and leadership of the Worldwide Oesophageal Cancer Collaboration

(WECC) — the largest and most comprehensive international database of Oesophageal cancer outcomes ever assembled, and the data foundation upon which both the 7th and 8th editions of the American Joint Committee on Cancer and Union for International Cancer Control (AJCC/UICC) Oesophageal cancer staging manuals were built. Dissatisfied with the existing TNM staging system for Oesophageal cancer, which had been based on small, predominantly single-institution datasets and was widely recognised as inadequate for predicting survival or guiding treatment decisions, Rice conceived the WECC in the mid-2000s as a means of replacing expert opinion and small-sample inference with genuinely data-driven staging.

The first WECC paper, published in Diseases of the Esophagus in 2009, reported the assembly of data from 13 institutions across Asia, Europe, and North America on patients undergoing esophagectomy alone — demonstrating for the first time that survival was monotonically stratified by all major tumour variables across a truly international dataset. This work directly informed the 7th edition AJCC/UICC staging of Oesophageal cancer, published in 2010 and representing the first wholly data-driven Oesophageal cancer staging classification. For the 8th edition, Rice initiated an expanded WECC effort in 2012, ultimately recruiting 33 institutions from six continents and assembling data on more than 22,000 patients — an increase in scale and scope that allowed for separate clinical, pathologic, and post-neoadjuvant staging classifications, subcategorisation of early tumours, and separate groupings for adenocarcinoma and squamous cell carcinoma. The results were published in a landmark series of papers in Diseases of the Esophagus in 2016, and the resulting staging recommendations were incorporated into the AJCC Cancer Staging Manual 8th edition in 2017. Rice served as the lead author on the Oesophageal cancer chapter of both the 7th and 8th editions of the AJCC Cancer Staging Manual — the definitive global reference for cancer staging. The staging system he created is now used in every country in the world to classify, treat, and prognosticate Oesophageal cancer.

Machine Learning, Precision Medicine, and Methodological Innovation

A defining feature of Rice's intellectual contribution has been his embrace of advanced statistical and computational methods at a time when most surgical researchers relied on far simpler tools. Working in long-standing partnership with biostatistician Eugene Blackstone and machine learning expert Hemant Ishwaran at the Cleveland Clinic, Rice pioneered the application of random survival forest algorithms — a machine learning technique capable of identifying complex, non-linear survival patterns across large datasets — to the problem of cancer staging. This methodological approach, introduced in a landmark 2009 paper in Biostatistics, allowed the WECC data to be analysed in ways that simple regression models could not achieve, yielding stage groups with genuinely monotonic and distinctive survival profiles. More recently, Rice has applied these same machine learning methods to the question of precision surgical therapy for Oesophageal adenocarcinoma: rather than asking what the average patient achieves with a given treatment, his analyses predict optimal therapy for individual patients based on their specific tumour and clinical characteristics — a fundamental shift toward personalised cancer care.

Scholarship, Leadership, and Legacy

The scope of Rice's published work is formidable. He has contributed hundreds of peer-reviewed articles and book chapters to the thoracic surgical literature, spanning Oesophageal cancer staging and therapy, benign Oesophageal disease, pulmonary surgery, and surgical oncology. His WECC publications alone have accumulated citations in the thousands, placing them among the most influential papers in the history of Oesophageal surgery. He has served on the editorial boards of the leading journals in his field, including the Journal of Thoracic and Cardiovascular Surgery and the Annals of Thoracic Surgery, and has served as a reviewer for the AJCC Upper Gastrointestinal Expert Panel across multiple staging editions. He is a Life Master of Duplicate Bridge — a pursuit that, like his surgical and statistical work, demands rigorous logic, systematic thinking, and the courage to act on probabilistic judgment under uncertainty.

Thomas W. Rice's legacy is that of a scientist-surgeon who brought the same analytical discipline to Oesophageal cancer staging that an engineer brings to a structural problem: insisting on large samples, rigorous methods, and results that hold across populations and continents. Before his work, Oesophageal cancer staging was imprecise, inconsistent, and poorly predictive. After it, every oncologist, surgeon, and radiation therapist in the world uses a data-driven classification system refined from more than 22,000 patients across six continents. Patients with Oesophageal cancer receive more accurate prognoses, more appropriate treatment recommendations, and more meaningful comparisons of outcomes across institutions — all because a mechanical engineer from Toronto decided to apply quantitative rigour to one of surgery's most intractable problems. Few surgeons of his generation can claim to have changed the standard of care for an entire malignancy at a global level. Thomas Rice is one of them.

Cutting Through the Noise: Why Quality Research Matters in Modern Surgical Publishing

Each morning, surgeons are greeted with an avalanche of new science—preprints, systematic reviews, and manuscripts generated with the support of available artificial intelligence forums. They seem to promise breakthroughs, yet often deepen confusion. More than three million scientific papers are published annually1, and yet, as Ioannidis reminded us nearly two decades ago, "most published findings may be false"2. In surgery, this paradox is acute: despite exponential growth in publications, practice-changing discoveries remain rare. The crisis today is not scarcity but saturation—an overwhelming abundance of data with uneven quality and limited clinical relevance. With so much output, we should ask whether we're adding useful knowledge or just adding volume. The issue now is not how much we publish, but whether it remains meaningful.

The transformation of publishing from curiosity to currency has subtly reshaped surgical science. The traditional motive—to explore, document, and share—has been overtaken by an economy of metrics. "Publish or perish" has evolved into a system that rewards output over insight. We often mistake volume for quality, prioritise novelty over reproducibility, and confuse visibility with real impact. This shows up as underpowered studies, repeated analyses of the same data, and fragmented reports that add little. Predatory journals, performance-based promotions, and citation-driven indices compound the problem, incentivising speed over scrutiny3. The core question should be simple: Does this paper teach something reliable and clinically relevant?

At its best, publishing is a professional reflection, not a formality. Every honest manuscript, however small, refines understanding and leaves a trace of experience for those who follow. Writing forces precision of thought and humility in interpretation—it transforms observation into evidence and practice into principle. For the surgeon, research is not merely academic currency; it is an instrument of accountability. Documenting examines our own practice; publishing invites others to check it. Research cultivates the same virtues as good surgery: curiosity, patience, and respect for detail. Even small, honest studies have value—they help us ask clearer questions, plan better analyses, and understand what our data can and can't show.

When unchecked, low-quality research can create clutter. Chalmers and Glasziou estimated that up to 85% of biomedical research constitutes avoidable waste stemming from flawed design, selective reporting, or poor dissemination4,5. In surgery, the problem is compounded by small sample sizes, heterogeneity, underpowered studies, and poorly formulated endpoints. Chapman and colleagues showed that a significant proportion of randomised surgical trials suffer from unclear hypotheses and inadequate methodological reporting, thereby reducing their translational value4. These problems carry over into meta-analyses and guidelines, where pooled weaknesses can strongly affect the evidence. As retractions increase and contradictory recommendations multiply, clinicians are left with a plentiful but unclear body of literature.

So, what makes research good?

In its simplest form, good research is useful, reproducible, honest, and humane. It starts with a useful question that addresses a real surgical problem or patient need. A study that transparently reports its limitations contributes more to progress than one that conceals bias behind statistical sophistication. Good research requires rigour: an appropriate design, transparent methodology, and sound statistics that focus on effect sizes and confidence intervals, not just p-values. It supports reproducibility—clear methods, shareable data when feasible, and use of reporting checklists such as CONSORT (Consolidated Standards of Reporting Trials) and STROBE (STrengthening the Reporting of OBservational studies in Epidemiology)[6,7].

Shared definitions improve comparability and reduce noise. For example, the ISGPS (International Study Group of Pancreatic Surgery) update on postoperative pancreatic fistula (2016) standardised grades and endpoints, allowing centres to report outcomes on the same terms and making meta-analyses more reliable8. Similarly, the PANTER (PAncreatitis, Necrosectomy versus sTEp up appRoach) trial transformed the management of infected pancreatic necrosis by demonstrating that a minimally

invasive step-up approach reduced major complications and mortality compared with open necrosectomy9. These trials exemplify how well-defined methods and collaboration can change clinical practice.

Well-designed multicentre RCTs illustrate what "useful" looks like in practice. The PRODIGE-24/ACCORD-24 trial in pancreatic cancer changed adjuvant therapy by demonstrating superior survival with mFOLFIRINOX compared with gemcitabine, showing how clear questions and robust methods can reshape care10. Collaborative models such as ERAS programmes in colorectal surgery, tested and refined across centres, have consistently reduced length of stay and complications when implemented with fidelity—evidence that transparent protocols and multicentre validation matter11.

Good research also upholds responsibility. Authorship should reflect contribution, not hierarchy, and conflicts of interest must be declared, not hidden. Negative results are reported with the same vigour as positive ones. Good research is transparent about its motives and methods, seeking clarity rather than merely citations. Good research also reports context—resources, learning curves, and human factors—rather than simplifying away real-world variation, so that findings hold up across centres, regions, and resource settings12. As the Hong Kong Principles advocate, integrity should be rewarded not by publication count but by the quality, transparency, and societal value of research13.

Importantly, the spectrum between "bad" and "good" research is not absolute. Every honest effort—no matter how modest—adds to a surgeon's development as a thinker. Poorly designed studies, if analysed with humility, teach as much about the process of enquiry as successful ones. They highlight gaps in training, mentorship, and infrastructure. The task is not to silence such research but to guide it through peer review, mentorship, and collective oversight that transform intent into quality. A mature academic ecosystem must therefore separate poor-quality work from early work that is improving, support sincere efforts, and still expect higher standards. As Glasziou and Chalmers wrote, "research waste is still a scandal," but it also presents an opportunity: a call to create systems that make good practice the default14.

Ultimately, the act of publishing should return to its ethical and academic roots. We publish to document truth and advance shared knowledge, not to pad a résumé. The aim is not perfection, but progress that others can trust and reproduce. Manuscripts, like operations, should be careful, precise, and useful. Publishing with purpose is a professional obligation that keeps surgery both scientific and humane.

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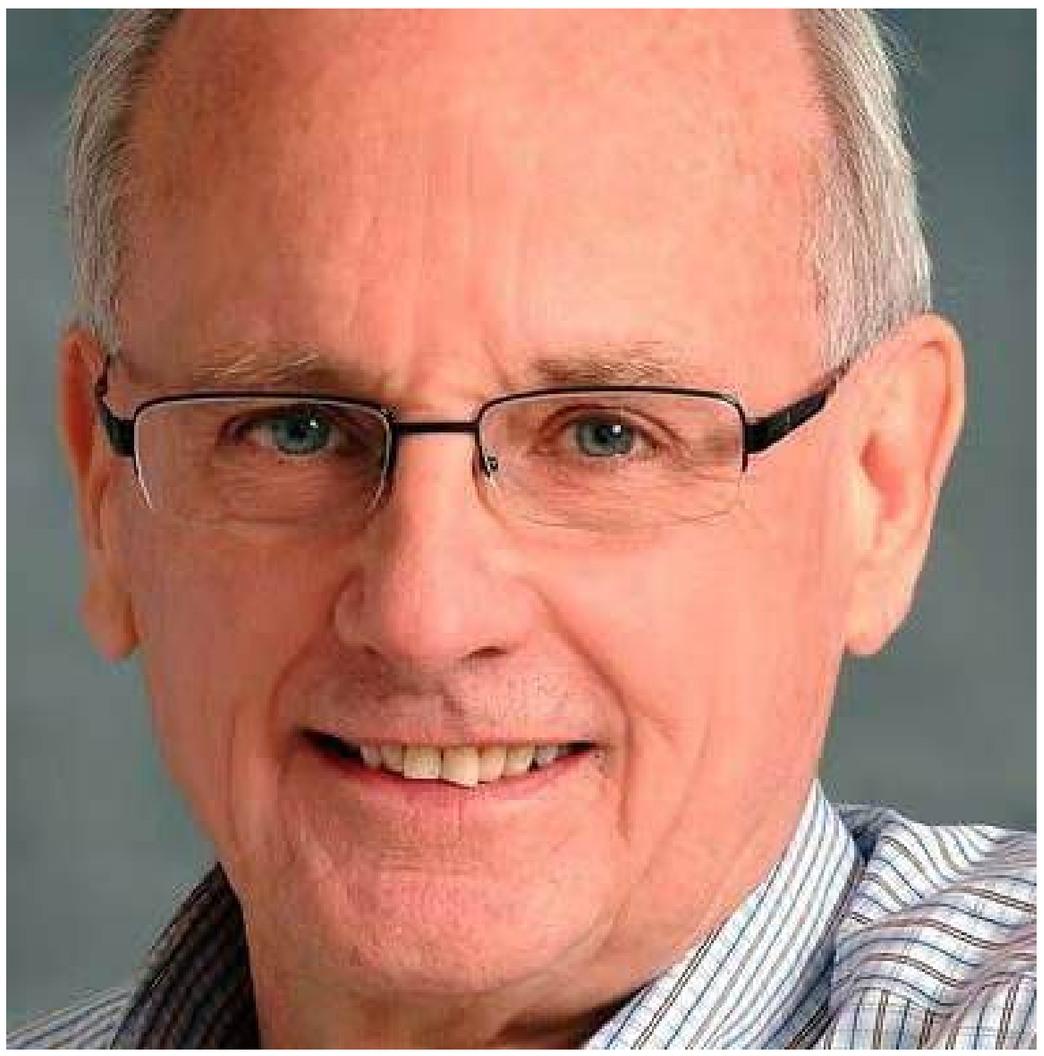
Top surgeons who transformed Oesophageal surgery

Donald E. Low, MD, FACS, FRCS(C)

Pioneer of Oesophageal Outcomes Standardization and Clinical Pathways



Origins, Education, and Formation

Donald E. Low was born and raised in Canada, where his early academic promise carried him to the Faculty of Health Sciences at Queen's University in Kingston, Ontario, where he earned his medical degree in 1981. His general surgical training was completed across two of Canada's finest institutions — the University of Toronto and Queen's University — an arrangement that gave him broad exposure to academic surgical culture on both coasts of Ontario. Upon completing his general surgical residency, Low made a decision that would define his career's direction: he moved his family to Seattle, Washington, to undertake a thoracOesophageal surgery fellowship at Virginia Mason Medical Center under Dr. Lucius Hill — one of the pioneering figures in anti-reflux surgery in the United States. Recognising that a truly complete formation required international exposure, he subsequently spent time training in the United Kingdom: at the Royal Devon and Exeter Hospital under Dr. Michael Pagliero, and at East Birmingham Hospital under Dr. Hugo Matthews — two of England's most respected thoracic units. He then joined Dr. Joel Cooper at Washington University in St. Louis for a lung transplantation fellowship, helping to establish the first lung transplant programme in the United States and the second in the world.

In 1990, Low was appointed to Virginia Mason Medical Center in Seattle as its first full-time general thoracic surgeon in Washington State — a distinction that speaks to both the rarity of dedicated Oesophageal and thoracic expertise in the region at that time and to the confidence Virginia Mason placed in his abilities. He would remain at Virginia Mason for the entirety of his career, building a programme of international recognition from what was, at his arrival, a hospital without a dedicated thoracic surgery section.

Virginia Mason: Building a Centre of Oesophageal Excellence

Over more than three decades, Low transformed Virginia Mason's thoracic and Oesophageal surgery programme into one of the most respected in North America. His clinical expertise encompasses the full spectrum of oesophago-gastric disease: Oesophageal cancer, achalasia, giant paraOesophageal hernia, gastro-Oesophageal reflux disease, Barrett's oesophagus and early neoplasia, Oesophageal perforation, and complex revisional surgery. He developed particular expertise in the management of elderly patients undergoing oesophagectomy, demonstrating in a landmark series that carefully selected patients over the age of 80 could undergo oesophagectomy with complication rates, hospital stay, and survival outcomes comparable to younger cohorts — a finding that challenged prevailing assumptions and extended the offer of curative surgery to a previously excluded population. He also pioneered and rigorously evaluated standardised clinical pathways for oesophagectomy, demonstrating that systematic perioperative protocols — governing everything from anaesthetic technique and pain management to nutrition and early mobilisation — significantly reduced complications, shortened hospital stays, and reduced costs. The Standardised Oesophagectomy Clinical Pathway developed at Virginia Mason was subsequently adopted at the Royal Surrey County Hospital in the United Kingdom, one of the first verified international transfers of an evidence-based Oesophageal surgery protocol.

The ECCG: Giving the World a Common Language

Donald Low's most globally consequential contribution to surgery is the creation and leadership of the Esophagectomy Complications Consensus Group (ECCG) — the first and still the definitive international effort to standardise the definitions and reporting of complications after oesophagectomy. Before the ECCG's work, the Oesophageal surgery literature was in a state of methodological disarray: a landmark systematic review of over 57,000 oesophagectomies found that no single complication was defined in all published studies, and fewer than 40 percent provided any precise definition of the complications they reported. The result was that complication rates quoted in the literature were virtually incomparable between institutions, countries, or time periods — an obstacle to quality improvement, evidence synthesis, and meaningful international audit that had persisted for decades.

Low convened the inaugural ECCG meeting in Newcastle, United Kingdom in 2011, bringing together 21 high-volume Oesophageal surgeons from 14 countries — spanning Asia, Europe, and North America — under the auspices of all the major upper gastrointestinal and thoracic surgical societies including the ESTS, STS, SSAT, and ISDE. Through a structured series of Delphi surveys and three full-day face-to-face meetings, the group reached consensus on a standardised list of complications, specific definitions for the four most critical individual complications (anastomotic leak, conduit necrosis, chyle leak, and recurrent nerve palsy), and a set of quality parameters for routine inclusion in all oesophagectomy outcome databases. The landmark paper reporting these consensus definitions was published in the Annals of Surgery in 2015 and immediately adopted by the Society of Thoracic Surgeons' national database, the Dutch national Oesophageal cancer audit, the Neo-AEGIS international randomised trial, and multiple national programmes across Europe and Asia.

Building on this foundation, Low and the ECCG developed Esodata.org — a secure, prospective international database through which participating centres entered data on all oesophagectomies according to ECCG definitions. The benchmarking paper published in the Annals of Surgery in 2019, reporting outcomes on 2,704 Oesophageal resections from 24 high-volume centres across 14 countries, provided the first genuinely contemporaneous international standard for complication incidence after oesophagectomy — data that has since been used by institutions worldwide to audit their own performance, identify deficiencies, and target quality improvement efforts. Low's editorial commentary in Diseases of the Esophagus, co-authored with Giovanni Zaninotto, framed the ECCG's mission with characteristic directness: it was time, he wrote, for Oesophageal surgeons to speak the same language.

ERAS, Perioperative Care, and Multidisciplinary Innovation

Low's influence on modern Oesophageal surgery extends beyond complication reporting into the broader domain of perioperative care. He served as the lead author on the Enhanced Recovery After Surgery (ERAS) Society's consensus guidelines for perioperative care in oesophagectomy, published in World Journal of Surgery in 2019 — the most comprehensive international evidence-based guidance document for the peri-operative management of oesophagectomy patients ever assembled. Encompassing pre-operative optimisation, anaesthetic protocols, intraoperative fluid management, pain control, nutrition, mobilisation, and discharge criteria, the ERAS oesophagectomy guidelines represent the field's collective wisdom distilled into actionable clinical standards. He also contributed to the 2018 ISDE consensus guidelines on achalasia, reflecting the breadth of his expertise across the full spectrum of Oesophageal disease. His research programme at Virginia Mason has addressed multidisciplinary tumour board practices, endoscopic versus surgical management of early Oesophageal neoplasia, outcomes of paraOesophageal hernia repair in the elderly, management of acute Oesophageal perforation, and the cost-effectiveness of competing management strategies for Oesophageal cancer.

Scholarship, Honours, and Legacy

Low is the author of hundreds of peer-reviewed publications spanning Oesophageal cancer outcomes, perioperative care, benign Oesophageal disease, and surgical quality improvement, with his ECCG-related papers among the most widely cited in the contemporary Oesophageal surgery literature. He is a Fellow of the American College of Surgeons and a Fellow of the Royal College of Surgeons of Canada, and has been awarded honorary fellowships by the Royal College of Surgeons of England and the Royal College of Surgeons of Ireland — a distinction reserved for surgeons of exceptional international stature. He is the Ryan Hill Professor of ThoracOesophageal Surgery at Virginia Mason, an endowed chair that honours the fellowship he undertook at the outset of his career and reflects the institution's recognition of his unique contributions to its academic standing.

Donald Low's legacy in surgery is that of a methodologist, standardiser, and builder of international collaborative infrastructure at a time when Oesophageal surgery urgently needed all three. His recognition that surgeons could not improve what they could not consistently measure — and his determination to build the measurement tools that the field lacked — was an act of intellectual leadership as important as any technical innovation. The ECCG's definitions are now the global standard for reporting outcomes after oesophagectomy. Esodata is the world's largest prospective international oesophagectomy database. The ERAS guidelines he led have changed perioperative care for Oesophageal cancer patients on every continent. And through his clinical pathways, his outcomes research, and his three decades of practice at Virginia Mason, he has contributed directly to improved survival and quality of life for thousands of patients with Oesophageal disease. He is, by any measure, one of the most consequential figures in modern Oesophageal surgery.

Prone Position Thoracoscopic Esophagectomy: From Concept to Global Standard

Abstract

The evolution of minimally invasive esophagectomy (MIE) has been driven by surgeons who combined rigorous anatomical understanding with technical innovation. Among these pioneers, Dr. C. Palanivelu occupies a defining position for conceptualizing, standardizing, and globalizing thoracoscopic esophagectomy performed in the prone position. This article traces the genesis of the technique, its anatomical and technical advantages, scientific validation through published evidence, pathways of global dissemination, and enduring legacy, illustrating how an innovation originating in India transformed Oesophageal surgery worldwide.

Introduction

Esophagectomy remains one of the most complex operations in gastrointestinal surgery, historically associated with substantial morbidity, particularly pulmonary complications. The transition from open to minimally invasive approaches sought to improve visualization, precision, and postoperative recovery while preserving oncological rigor. Within this transformative period, prone position thoracoscopic esophagectomy emerged as a paradigm shift that challenged entrenched surgical and

Genesis of the Technique(1996):

In 1996, Dr. Palanivelu introduced thoracoscopic esophagectomy in the prone position, at a time when the lateral decubitus position with one-lung ventilation was considered indispensable. He demonstrated that the thoracic phase could be safely and effectively performed using two-lung ventilation with a single-lumen endotracheal tube, directly challenging prevailing dogma.

This innovation represented far more than a change in patient positioning. It was a fundamental reappraisal of mediastinal anatomy under the influence of gravity, enabling a more stable, ergonomic, and physiologically favorable operative environment.

Anatomical and Technical Advantages:

Through extensive and consistent clinical experience, the intrinsic advantages of the prone approach became evident:

- Gravitational anterior displacement of the lung, eliminating the need for active lung retraction
- Inferior displacement of the heart and mediastinal structures, naturally widening the posterior mediastinum

- A stable and relatively bloodless operative field with superior visualization
- Clearer anatomical planes, reducing the risk of thoracic duct injury
- Safer and more controlled mobilization of the mid-thoracic esophagus
- A continuous panoramic view of the posterior mediastinum from thoracic inlet to diaphragmatic hiatus

These features translated into precise dissection, oncological adequacy, and—critically—reproducibility, facilitating wider adoption among Oesophageal surgeons globally.

Scientific Evidence and Validation:

Scientific legitimacy was established with Dr. Palanivelu's landmark publication in the Journal of the American College of Surgeons, reporting thoracoscopic mobilization of the esophagus and mediastinal lymphadenectomy in the prone position.

In this seminal series of 130 patients, the authors demonstrated:

» Feasibility without lung isolation

» Low perioperative mortality (~1.5%)

» Median hospital stay of approximately 8 days

» Significantly reduced respiratory complications

» Oncologically sound mediastinal lymphadenectomy

Subsequent studies from India, Japan, and Europe consistently corroborated these findings, reporting lower pulmonary morbidity, improved operative visualization, and comparable or superior oncological outcomes when compared with lateral decubitus MIE.

ORIGINAL SCIENTIFIC ARTICLE

Minimally Invasive Esophagectomy: Thoracoscopic Mobilization of the Esophagus and Mediastinal Lymphadenectomy in Prone Position—Experience of 130 Patients

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Author Information

Journal of the American College of Surgeons 203(1):p 7-16, July 2006. | *DOI:* 10.1016/j.jamcollsurg.2006.03.016

Landmark Journal of the American College of Surgeons publication validating prone position thoracoscopic esophagectomy (130-patient series).

Global Dissemination Through Video and Live Surgery:

Recognizing the central role of visual learning in surgery, Dr. Palanivelu meticulously documented the technique through high-quality operative videos. Presentations at SAGES and the American College of Surgeons were pivotal in introducing prone thoracoscopic esophagectomy to an international audience.

His thoraco-laparoscopic esophagectomy video received the Best Video Award at SAGES, highlighting both technical excellence and exceptional educational value.

Patient positioning for prone thoracoscopic esophagectomy demonstrating stable ergonomic alignment.

Live thoraco-laparoscopic esophagectomy at ELSA Congress, Hong Kong (2005), marking the first major international dissemination of the prone position technique.

Live Demonstrations and International Teaching:

- The technique gained further credibility through live surgical demonstrations across multiple continents:
- ELSA Conference, Hong Kong (2005) – Live thoraco-laparoscopic esophagectomy
- Manchester, United Kingdom (2008) – Live demonstration
- Detroit, USA – Live esophagectomy
- Japan – Served as Course Director for esophagectomy, shaping structured training and national adoption.
- These live demonstrations were instrumental in addressing skepticism and demonstrating the safety, ergonomics, and reproducibility of the prone approach.

Integration with Robotic Surgery:

As surgical technology evolved, the prone thoracoscopic philosophy was seamlessly extended to robotic platforms. Comparative analyses between thoraco-laparoscopic and robotic-assisted esophagectomy demonstrated that positional anatomy and surgical ergonomics, rather than technology alone, were central to improved outcomes.

The continued recognition of the original thoraco-laparoscopic technique—including the Best Video Award at the Asia-Pacific Robotic Conference (Taiwan, 2017)—underscored its enduring relevance.

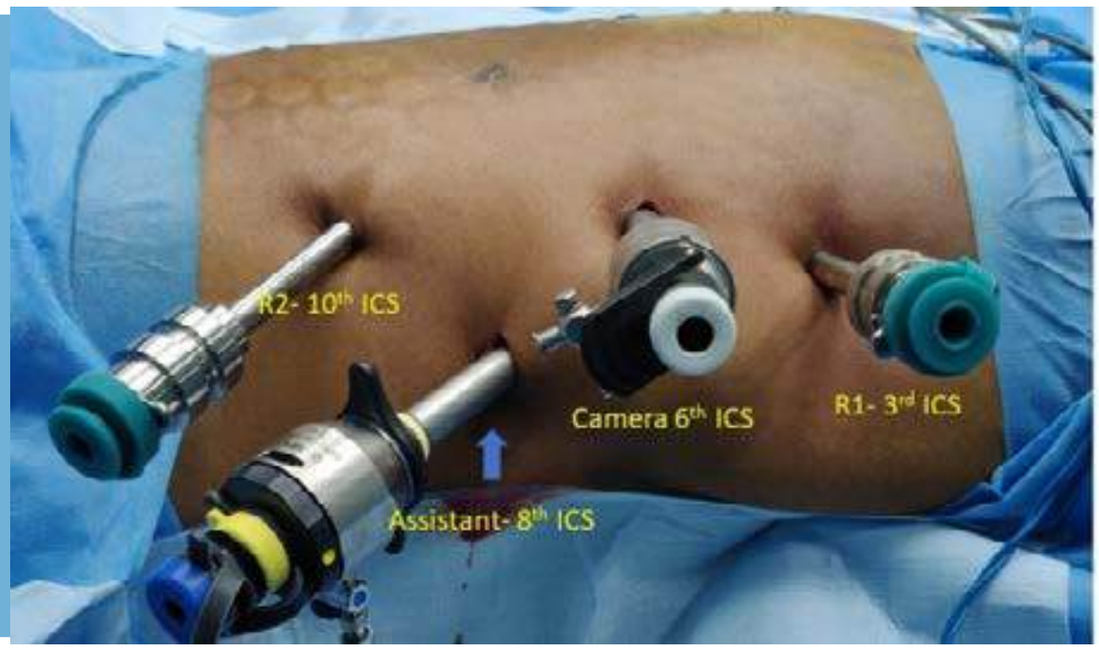
Unmatched Clinical Experience:

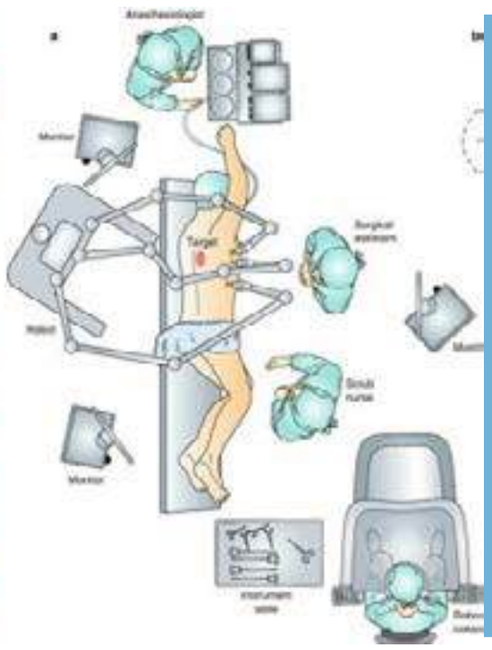
By 2020, Dr. Palanivelu had completed 1,000 thoraco-laparoscopic esophagectomies, representing one of the largest single-surgeon experiences globally. This volume provided compelling real-world evidence of consistency, safety, and durability of outcomes, firmly establishing prone position MIE as a mature and reliable surgical standard.

International Recognition and Enduring Legacy (2025):

The global influence of prone position thoracoscopic esophagectomy was formally acknowledged in 2025, when the Japanese Association for Thoracic Surgery conferred Honorary Membership upon Dr. Palanivelu during its 78th Annual Scientific Meeting in Osaka.

The Society cited his pioneering development of thoracoscopic esophagectomy in the prone position and its profound impact on thoracic surgical practice in Japan. Notably, the leadership acknowledged that this Indian innovation had shifted the national standard for esophagectomy in Japan from the traditional left lateral decubitus position to the prone position—an exceptional endorsement from one of the world's most technically rigorous Oesophageal surgery communities.





Standardized port placement in prone position thoracoscopic esophagectomy.

Conclusion:

Prone position thoracoscopic esophagectomy has evolved from a bold conceptual innovation into a globally accepted surgical standard. Its success rests on sound anatomical logic, technical elegance, rigorous scientific validation, and sustained commitment to education and dissemination.

For surgeons and gastrointestinal surgeons alike, this journey reinforces a fundamental lesson: meaningful surgical progress arises not merely from new instruments, but from rethinking anatomy, respecting physiology, and having the conviction to challenge convention.

Dr. Palanivelu's contribution stands as a landmark in the history of Oesophageal surgery and will continue to influence practice, training, and patient outcomes for generations to come.

Key Publications and Citations :

1. Palanivelu C, et al. Minimally Invasive Esophagectomy: Thoracoscopic Mobilization of the Esophagus and Mediastinal Lymphadenectomy in the Prone Position—Experience of 130 Patients. Journal of the American College of Surgeons, 2006/2007.

2. Subsequent international series validating prone position MIE with reduced pulmonary morbidity and equivalent oncological outcomes (Japan, Europe).

3. Best Video Award, SAGES, Thoraco-laparoscopic Esophagectomy (Year).

4. Best Video Award, Asia-Pacific Robotic Conference, Taiwan (2017).

5. Honorary Membership, Japanese Association for Thoracic Surgery, Osaka (2025).

Best Technique Award, International Society for Diseases of the Esophagus (Japan, 2010).

Conferment of Honorary Membership by the Japanese Association for Thoracic Surgery (2025).

KEY MILESTONES IN THE EVOLUTION OF PRONE POSITION MINIMALLY INVASIVE ESOPHAGECTOMY

Year	Milestone	Significance
1996	Introduction of prone thoracoscopic esophagectomy	Marked a conceptual shift from the lateral decubitus position, leveraging gravity for improved mediastinal exposure and reduced lung interference
1998–2000	Technique refinement and standardization	Demonstrated feasibility with two-lung ventilation and established reproducibility of the prone approach
2005	Live surgery demonstration at ELSA Conference, Hong Kong	First major international dissemination, increasing global awareness and interest
2006–2007	Publication in JACS (130-patient series)	Provided scientific validation with evidence of reduced pulmonary morbidity and oncological adequacy
2008–2012	Global live demonstrations and educational videos	Facilitated widespread adoption of the technique across multiple continents
2013–2017	Integration with robotic platforms; AP Robotic Conference Award	Confirmed enduring relevance and adaptability of the prone approach in the robotic surgery era
2020	Completion of 1,000 thoraco-laparoscopic esophagectomies	Offered high-volume evidence supporting long-term safety, consistency, and durability
2025	Honorary Membership of JATS	Formal recognition of global impact and establishment of the prone approach as standard practice in Japan

Top surgeons who transformed Oesophageal surgery

Raja Michael Flores, MD, FACS
Champion of Minimally Invasive Thoracic Oncology and Oesophageal Excellence

Origins, Education, and Formation: From the Streets of Manhattan to the Operating Room

Raja Michael Flores was born and raised in New York City, the son of Dominican immigrants who settled in Washington Heights — one of Manhattan's most densely populated and economically challenged neighbourhoods. His upbringing was defined not by privilege but by ambition: a gifted student who navigated some of the city's most demanding public school environments before winning a place at New York University, where he earned his Bachelor of Arts in Biochemistry in 1988. From NYU he proceeded to the Albert Einstein College of Medicine at Yeshiva University in the Bronx, where he received his Medical Degree in 1992 — the first in his family to achieve such a distinction, a fact that lends his subsequent career an additional resonance.

His postgraduate training was formidable in both its rigour and its geographic sweep. He completed a general surgery internship and residency at Columbia-Presbyterian Medical Center from 1992 to 1997 — one of the most demanding surgical training programmes in the United States. Recognising that thoracic oncology would be his field, he then moved to Boston for a Thoracic Oncology Clinical Research Fellowship at Brigham and Women's Hospital and the Dana-Farber Cancer Institute from 1997 to 1998 — an immersion in intraoperative chemotherapy, mesothelioma, and lung cancer research under some of the most distinguished oncological surgeons in the world. He then completed his Cardiothoracic Surgery Residency at Brigham and Women's Hospital under the auspices of Harvard Medical School from 1998 to 2000, simultaneously earning a Master of Science in Biostatistics from Columbia University — an unusual dual qualification that would prove a distinguishing feature of his academic work throughout his career.

Memorial Sloan Kettering and the Rise of a Thoracic Oncologist

In 2000, Flores was appointed Associate Attending Surgeon at Memorial Sloan Kettering Cancer Center and Associate Professor of Cardiothoracic Surgery at Cornell University Medical College — dual appointments that placed him at the intersection of elite oncological surgery and academic medicine in New York City. He remained at Sloan Kettering for a decade, during which his clinical and investigative interests crystallised around three domains: malignant pleural mesothelioma, lung cancer, and Oesophageal cancer. Under the mentorship of distinguished Sloan Kettering surgeons including Valerie Rusch, Robert Downey, and Manjit Bains, Flores refined his technical skills and developed the disciplined scientific instincts that would carry him to international prominence.

It was during these years at Sloan Kettering that Flores became one of the earliest and most committed practitioners of Video-Assisted Thoracoscopic Surgery (VATS) lobectomy — the minimally invasive removal of a lung lobe for cancer through small incisions using a camera and purpose-built instruments. He implemented the VATS lobectomy programme at Memorial Sloan Kettering and, crucially, subjected the procedure to the kind of rigorous oncological validation it had previously lacked. Two sentinel papers — one comparing VATS versus open thoracotomy in 741 patients, published in the Journal of Thoracic and Cardiovascular Surgery, and a second examining patterns of recurrence between the two techniques — demonstrated equivalent oncological outcomes with significantly lower complication rates, shorter hospital stays, and better preservation of pulmonary function for the VATS approach. These publications were among the most influential

in establishing VATS lobectomy as the gold standard in surgical lung cancer treatment worldwide.

Mount Sinai: Leadership, Oesophageal Surgery, and the STS Three-Star Distinction

In 2010, Flores was recruited to The Mount Sinai Medical Center as Professor and Chief of Thoracic Surgery, and Director of the Thoracic Surgical Oncology Programme at Mount Sinai Cancer Center — an appointment described by Mount Sinai's cardiothoracic surgery chairman as a reflection of his distinction as both a technically superb surgeon and a thoracic oncology scholar. In 2014, he was elevated to Chairman of the Department of Thoracic Surgery at Mount Sinai and the Icahn School of Medicine, and invested with the Steven and Ann Ames Professorship in Thoracic Surgery. Under his leadership, Mount Sinai's thoracic surgery programme grew into one of the most highly regarded in the United States, attracting patients with Oesophageal cancer, mesothelioma, lung cancer, tracheal disease, and complex revisional thoracic problems from across the country and internationally.

His contributions to Oesophageal surgery at Mount Sinai have been particularly noteworthy. Flores introduced a technically important modification to the standard esophagectomy approach: by repositioning the anastomotic junction between the stomach conduit and the remaining esophagus to a site of superior blood supply, he reduced mean operative time from approximately seven hours to two and a half hours while simultaneously cutting complication rates. The result has been a clinical programme of exceptional safety and efficiency. In 2023, under his leadership, Mount Sinai's esophagectomy programme received a three-star (Excellent) composite score from the Society of Thoracic Surgeons — the highest quality designation awarded by the STS, held by fewer than 13 institutions in the United States and Canada and placing Mount Sinai among the top 2.5 percent of all thoracic surgery programmes on the continent. Mount Sinai subsequently repeated this distinction, receiving top STS rankings for both lung and Oesophageal cancer surgery outcomes in 2025.

Mesothelioma, Asbestos Research, and Clinical Trial Leadership

While Oesophageal surgery has been an important strand of his work, Flores is perhaps most internationally celebrated for his transformative contributions to the surgical management of malignant pleural mesothelioma — an asbestos-related cancer of the lining of the lungs with a historically dismal prognosis. For decades, the surgical standard of care was the extrapleural pneumonectomy (EPP): the radical removal of the affected lung together with the surrounding pleura, pericardium, and hemidiaphragm. Flores challenged this orthodoxy directly. In a landmark study that became one of the most frequently cited papers in the Journal of Thoracic and Cardiovascular Surgery for two consecutive years, he demonstrated that pleurectomy with decortication — a lung-sparing procedure that removes only the diseased pleura while preserving the underlying lung — achieved equivalent survival to EPP with substantially lower morbidity and mortality. This finding represented a fundamental reorientation of mesothelioma surgery away from radicality and toward preservation of function.

His asbestos-related research has extended into the population at large. As Principal Investigator of the $4.8 million Libby Epidemiology Research Programme, funded by the Agency for Toxic Substances and Disease Registry, Flores has led a major study examining the long-term health consequences of childhood and adolescent exposure to Libby amphibole asbestos in Libby, Montana — a community whose asbestos contamination ranks among the worst environmental health disasters in American history. He is a vocal public advocate for a complete national ban on asbestos, contributing to regulatory debates in the United States and beyond.

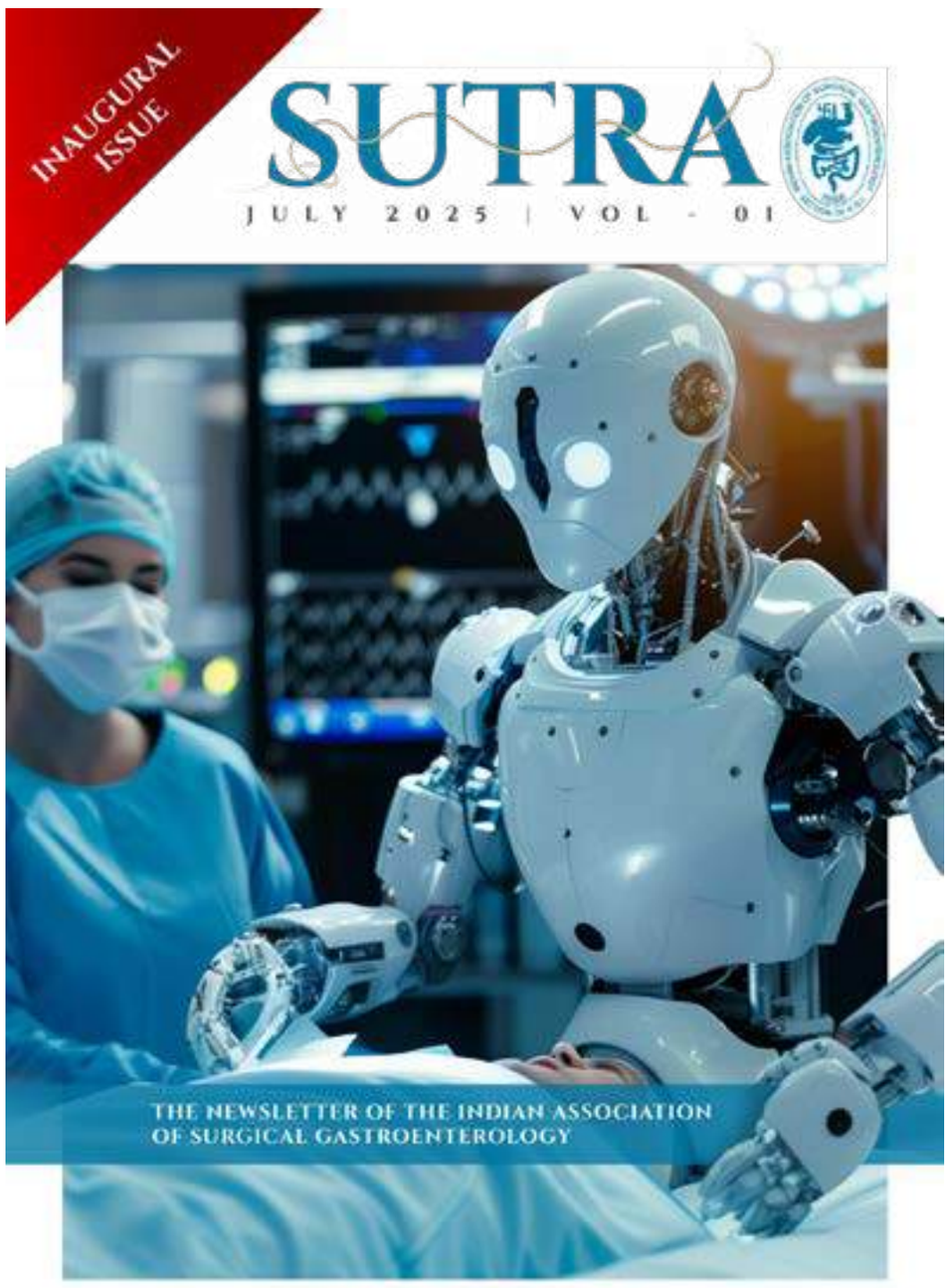
Scholarship, Civic Engagement, and Legacy

Flores has authored more than 300 peer-reviewed manuscripts, reviews, book chapters, and monographs. He serves on the editorial boards of the Journal of Thoracic and Cardiovascular Surgery, the World Journal of Gastrointestinal Surgery, the World Journal of Gastrointestinal Endoscopy, and the Annals of Translational Medicine, and reviews for more than thirteen journals including the Journal of Clinical Oncology. He is a Fellow of the American College of Surgeons and a member of the American Association for Thoracic Surgery, the Society of Thoracic Surgeons, the European Society of Thoracic Surgeons, and the General Thoracic Surgical Club. He has been named to the New York Top Doctors and America's Top Doctors lists for multiple consecutive years, and is regularly listed among the most highly rated thoracic surgeons in the United States. In 2021, he announced a campaign for Mayor of New York City — a remarkable expression of civic engagement from a surgeon who has spent his career not merely treating disease but engaging with the social and environmental conditions that produce it.

Raja Flores' legacy in thoracic and Oesophageal surgery is that of a surgeon whose ambition has always been inseparable from his origin

story. A child of Washington Heights who rose to lead one of the nation's most distinguished thoracic surgery programmes, he has consistently deployed his technical gifts, his biostatistical training, and his clinical authority in the service of patients whom the healthcare system has historically underserved — whether those patients are facing mesothelioma from occupational asbestos exposure, Oesophageal cancer requiring complex oncological resection, or lung cancer amenable to a minimally invasive cure. Through his VATS lobectomy studies, his landmark mesothelioma research, his esophagectomy innovations, and Mount Sinai's rare STS three-star distinction, he has demonstrated that world-class surgery and genuine public service are not merely compatible — they are, in the right hands, indivisible.

PREVIOUS ISSUES



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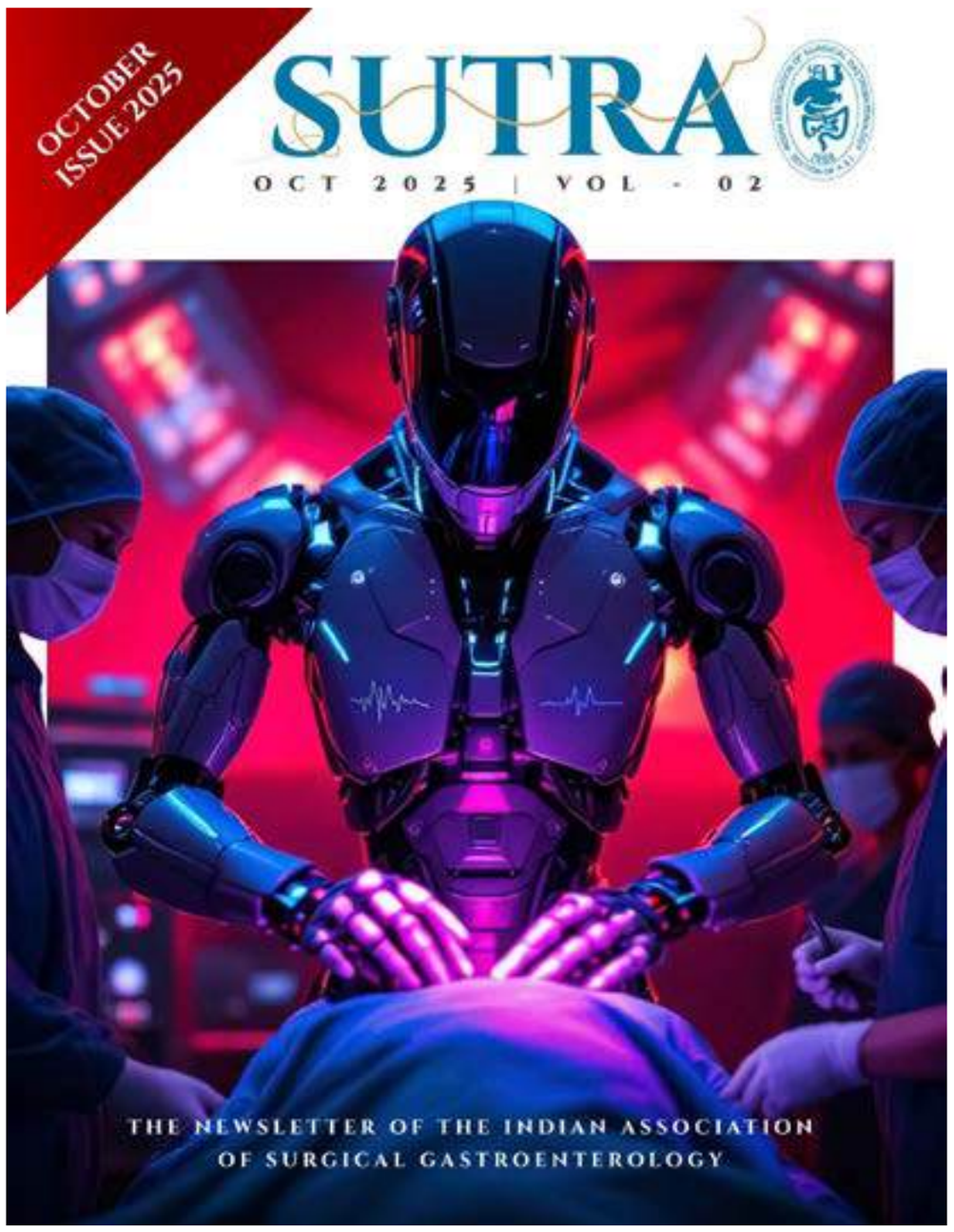

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Jaipur Hosts IHPBA India 2026

A Landmark Confluence of Global HPB Excellence

Jaipur recently became the center of global medical excellence as Dr. Naimish N. Mehta, Chairman of Centre for Digestive Sciences and Prof & Head of Department of HPB surgery and Liver Transplantation, at Mahatma Gandhi University of Medical Sciences and Technology, hosted the 22nd Annual National Conference of the Indian Chapter of the International Hepato-Pancreato-Biliary Association (IHPBA India 2026). Held at the Jaipur Marriott Hotel, the conference brought together approximately 750 participants from across India and several countries worldwide, marking one of the largest gatherings in the field of liver, pancreas, and biliary surgery in the nation.

The conference was organized under the banner of IHPBA India, in association with "The 2nd Liver Summit," and served as a major academic platform for specialists in complex diseases of the liver, pancreas, and biliary system. These conditions, which include liver cancer, pancreatic cancer, gallbladder disease, and advanced liver failure requiring transplantation, remain among the most challenging medical problems globally. Dr. Mehta said, The event focused on improving patient outcomes through innovation, collaboration, and evidence-based practice. The theme for this year's meeting was "Precision and Progress in HPB Surgery".

He also highlighted the participation of distinguished international experts from leading global centers in the United States, the United Kingdom, Singapore, South Korea, Malaysia, Australia, and Japan. Several of these internationally recognized pioneers in hepatobiliary and pancreatic surgery were present in Jaipur, sharing their expertise and engaging in high-level academic discussions. Their presence reinforced India's growing role in global surgical advancements and fostered meaningful international collaboration.

Over the course of the conference, a comprehensive scientific program was conducted, covering cutting-edge developments in minimally invasive liver surgery, pancreatic cancer management, complex biliary reconstruction, liver transplantation, and robotic surgery. Experts discussed the latest global guidelines, emerging technologies, and advancements in patient safety. Special emphasis was placed on multidisciplinary care, which integrates surgery, oncology, radiology, and critical care to provide comprehensive treatment.

The conference also featured structured debates, expert panel discussions, live surgical video sessions, and research presentations by young surgeons and trainees. These sessions allowed participants to exchange ideas, evaluate evolving treatment strategies, and critically assess new techniques. The strong participation of postgraduate trainees and early-career surgeons reflected the specialty's vibrant academic growth in India.

India has emerged as a major center for complex liver and pancreatic surgeries, particularly living donor liver transplantation. Dedicated sessions highlighted advances in donor safety, surgical precision, and postoperative care. Discussions also addressed the integration of modern technology, such as artificial intelligence, in surgical planning and enhanced recovery protocols to improve patient outcomes.

The scale of participation—nearly 750 attendees—demonstrated the credibility and academic strength of the Indian Chapter of IHPBA. Surgeons, physicians, researchers, and healthcare professionals from premier institutions across the country contributed to the scientific exchange. The gathering underscored India's expanding capabilities in delivering high-quality, world-class care in hepato-pancreato-biliary diseases.


Dr Naimish Mehta addessing the gathering

Global Liver Summit

MP Ghanshyam Tiwari with (L-R) Dr Sudhir Sachdev, Dr Darius Mirza, Dr ML Swarankar, Dr Puneet Dhar, Dr Biju and Dr Naimish Mehta

MUKESH KIRADOO

City First

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The three-day IHPBA 2026 International Conference commenced on Thursday, bringing together leading Liver and Hepato-Pancreato-Biliary (HPB) surgeons from across the globe on Thursday. Organised alongside the 2nd Liver Summit under the aegis of Mahatma Gandhi University of Medical Sciences and Technology, the conference aims to discuss advancements and challenges in liver and HPB surgery, informed Conference Chairman Dr Naimish N. Mehta.

Rajya Sabha MP Ghanshyam Tiwari attended as the Chief Guest, while Founder Chairman Dr ML Swarnakar presided over the inaugural session. Delivering the keynote address, renowned UK-based transplant surgeon Dr Darius Mirza stressed that liver transplantation must be accessible to all, highlighting low organ donation rates and delayed diagnoses in India. He also called for greater financial support.

Experts, including Prof Jin Young Jang, Prof Glenn K Bonney, Prof Takayuki Wakabayashi, Prof Vishal Shelat, Prof Hyesol Jung and Prof Chandra Bhati, participated. Scientific sessions covered gallbladder diseases, pancreatitis, robotic surgery and AI-based planning for hepatocellular carcinoma.

Beyond the academic sessions, the conference fostered professional networking and collaboration. Informal interactions between national and international faculty created opportunities for future joint research, training programs, and institutional partnerships. Jaipur's hospitality and infrastructure provided an ideal setting for hosting an event of this magnitude.

The successful execution of IHPBA India 2026 marks an important milestone for surgical science in the country. It reflects not only the rapid progress of hepatobiliary and pancreatic surgery in India but also the nation's ability to host global academic events of the highest standard.

As the conference concluded, it left behind a clear message: India is playing an increasingly significant role in shaping the future of advanced liver and pancreatic care. The deliberations and collaborations initiated in Jaipur are expected to translate into improved patient care, stronger international partnerships, and continued innovation in this highly specialized field.


आईएचपीबीए-2026 लिवर, एचपीबी सर्जन्स की अंतरराष्ट्रीय कॉन्फ्रेंस शुरू

कैडेवर डोनेशन से किए जा रहे 90% ट्रांसप्लांट

Theme: Precision and Progress in HPB

फोटो: मुकेश किराडू

Jaipur's hosting of IHPBA India 2026 will be remembered as a defining moment in advancing surgical excellence in the region and the country at large.

Upcoming Surgical-Gastro & Hernia Conferences (2026)

Event	Organizer	Start Date	End Date	Location	“Abstract Deadline”	
Deadline"	Notes					
MIIDCON IASO	Indian Association of Surgical Oncology	07-02-26	08-02-26	Raipur		
IHPBA	Indian Chapter of	26-02-	28-02-	Jaipur	10-11-	22nd Annual Conference;
India 2026	IHPBA	2026	2026	Marriott Hotel, Jaipur,	2025	Theme: Precision & Progress in HPB Surgery;
				India		2nd Liver Summit.
IAGES-	IAGES & ELSA	12-02-	15-02-	Mumbai, India		Combined IAGES and
ELSA		2026	2026			ELSA Congress.
Combined						
Congress						

2026						
SSO 2026	Society of Surgical Oncology	05-03-2026	07-03-2026	Pheonix, Arizona	Closed	SSO Annual meeting
APHBA 2026	American HPB association	19-03-26	22-03-26	Miami	Closed	
HBP Surgery Week 2026	Korean association of HBP surgery	26-03-26	28-03-26	Incheon , South Korea	09-01-2026	
KSERS 2026	Korean Association of Endo Laparoscopic and Robotic Surgeons	23-04-26	25-04-26	Seoul, South Korea	07-01-2026	
DDW 2026	SSAT	02-05-26	05-05-26	Chicago	Closed	
ASCO	American Society of clinical oncology	29-05-26	02-06-26	Chicago	27-01-26	
ACRSICON	Association of	05-06-	07-06-	Ahmedabad,	15-04-	22nd Annual Conference;
2026	Colon & Rectal Surgeons of India (ACRSI)	"2026				
(Tentative)"	"2026					

(Tentative)"	India	2026	plenary lectures and master-classes.			
AMASICON	Association of	27-08-	30-08-	Kolkata, India	31-05-	21st Interna-tional
2026	Minimal Access	2026	2026		2026	Conference of AMASI;
	Surgeons of In-dia					Abstracts till 31 May
	(AMASI)					2026
IASGCON	Indian	10-10-	13-10-	Bhubaneswar,	To be	Annual Nation-al
2026	Association of	2026	2026	Odisha, India	decided	Conference; Dates &
	Surgical	(Tentative)	(Tentative)			deadlines to be
	Gastroenterolo-gy (IASG)					confirmed.
IHPBA	International	28-10-	31-10-	Suntec	31-03-	17th World Congress;
World	Hepato-	2026	2026	Singapore	2026	global HPB event with

Congress	Pancreato-			Convention &		
2026	Biliary			Exhibition		symposia and live
	"Association					
(IHPBA)"			"Centre,			
Singapore"		surgeries.				
ESSO	European Society Of Surgical Oncology	04-11-26	06-11-26	Madrid		
APHS 2026	Asia Pacific	06-11-	07-11-	Grand Cube	To be	21st APHS Congress;
(Asia	Hernia Society	2026	2026	Osaka, Japan	decided	concurrent Hernia
Pacific	(APHS)					Essentials course (4–5
Hernia Society)						Nov).

IHPBA INDIA

TASG

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IHPBA INDIA 2027

HYDERABAD

23rd National Conference of Hepato-Pancreato-Biliary Association

Theme: Evidence, Expertise & Excellence in HPB

25th - 28th FEBRUARY 2027

HYDERABAD

Welcome Message

From the heart of India rises a region shaped by courage, culture, and conviction. This is a place born of sacrifice, one that stood firm to protect its identity, dignity, and future.

Here, culture is not preserved in museums alone—it lives and breathes in every village, in every rhythm of music, in every act of devotion, and in traditions passed seamlessly through generations. Every stone here speaks history, grand architecture narrates stories of enduring wisdom and pride that have stood tall for centuries.

Every flavor here carries a story. Food is more than sustenance—it is tradition, memory, and identity, reflecting the soul of its people in every taste.

At the same time, this land moves confidently towards tomorrow, where innovation thrives and technology connects it to the world. It is a hub of health and healing, home to world-class hospitals and one of Asia's largest pharmaceutical ecosystems, offering hope to millions.

This region has also made remarkable contributions to HPB surgery through visionary leadership, dedicated mentorship, and academic excellence that continues to inspire generations of surgeons.

Now, that legacy comes alive—bringing together knowledge, innovation, and purpose on one remarkable platform.

Telangana welcomes you to an exceptional academic experience at our IHPBA National Conference in February 2027 at Hyderabad.

Experience science with purpose, learning with legacy, and the genuine warmth of people.

This is **TELANGANA**.
Welcoming the world of HPB.

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Meet the Masters

Daily Breakfast Session (8–9 AM) with National & International HPB Faculty

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App-based digital agenda with real-time updates and session take-home points

Keynote Speakers

Renowned experts from around the globe sharing the latest in surgical gastroenterology

PG Bursary Program

Connect, *interact* and *grow* in an academic platform where young minds meet dynamic experts

Master Videos

Intra operative tips, tricks & trouble shooting from the experts in the field of HPB

Interactive Workshops

- Robotics - Hands on
- CUSA *(Cavitron Ultrasonic Surgical Aspirator)*
- Wet Labs with Vascular Suturing
- Intraoperative Ultrasound

Cultural Program

Experience the rich cultural heritage of Telengana with special event

Registrations

Category	Pre-launch (During IHPBA 2026)	Early Bird 1st Mar' - 20th Nov' 2026	Regular 21st Nov'- 31st Dec' 2026	Late 1st Jan' 2027 - 24th Feb' 2027	Spot 25th Feb' 2027 onwards
IHPBA Member (Indian)	INR 10,000	INR 12,000	INR 14,000	INR 16,000	INR 18,000
IHPBA Non-Member (Indian)	INR 12,000	INR 14,000	INR 16,000	INR 18,000	INR 20,000
Foreign Delegate	USD 200	USD 220	USD 250	USD 320	USD 420
PG Student	INR 7,000	INR 8,000	INR 9,000	INR 12,000	INR 14,000
Accompanying Person	INR 7,000	INR 8,000	INR 9,000	INR 12,000	INR 14,000
Industry Delegate	INR 10,000	INR 14,000	INR 16,000	INR 18,000	INR 20,000

Rates valid for individual registration only

Held biennially in Telangana, Medaram Jathara is Asia's largest tribal congregation, honoring the revered goddesses **Sammakka** and **Saralamma**.

Drawing millions of devotees, this vibrant festival reflects the rich heritage, spiritual traditions, and cultural identity of India's indigenous communities.

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Outstations in Telangana

65 KM

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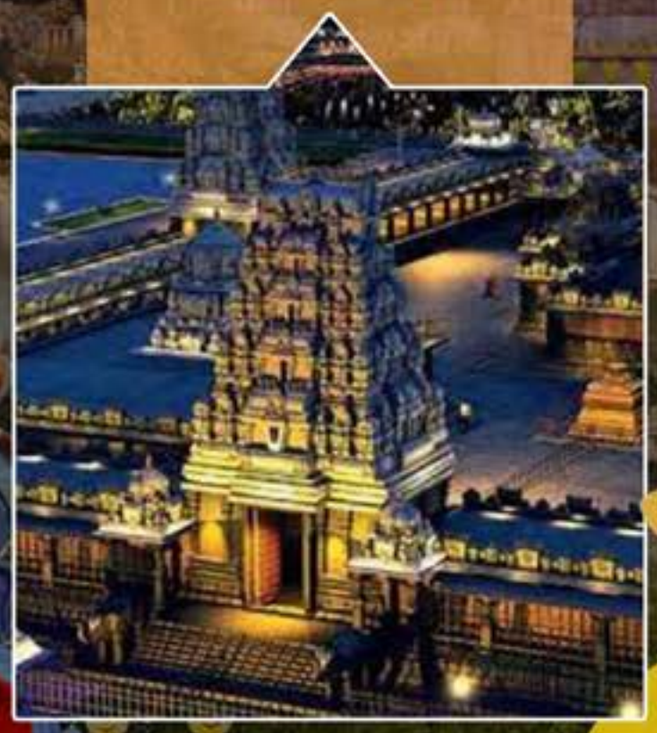
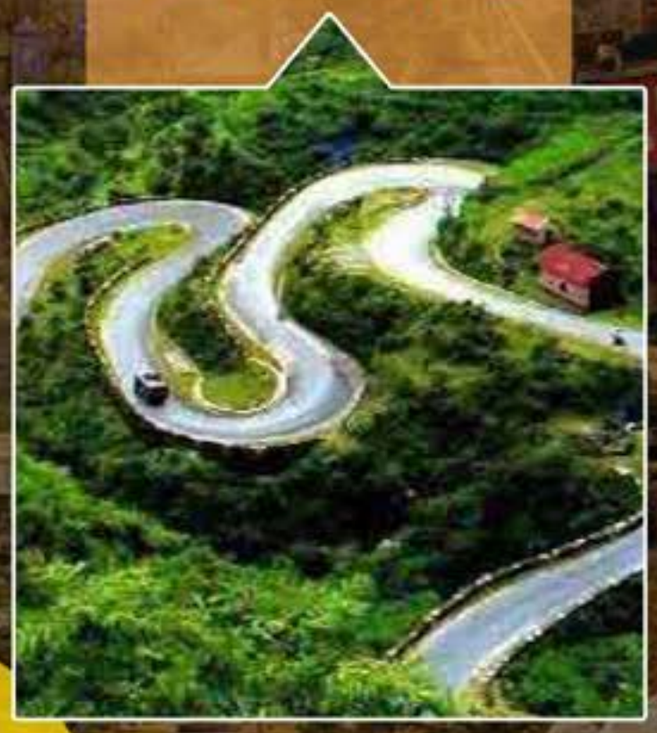
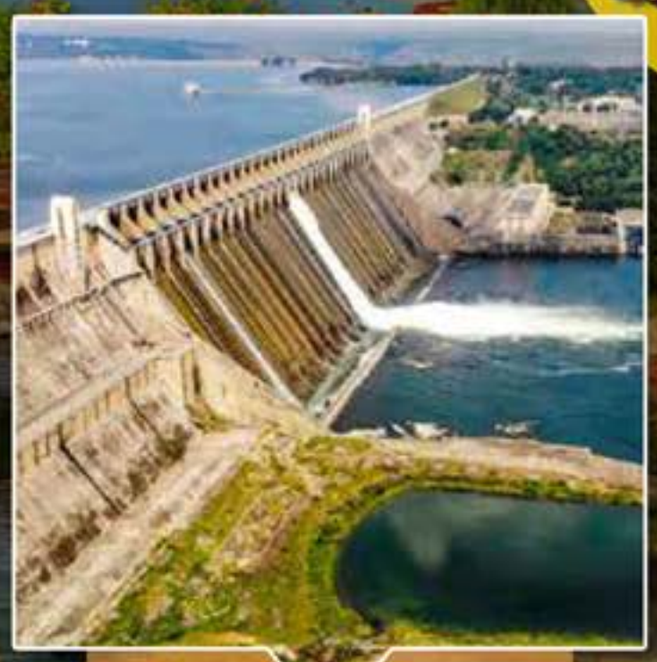


85 KM

ANANTHAGIRI HILLS





NAGARJUNA SAGAR

156 KM

BHADRACHALAM

310 KM

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International Society for Diseases of the Esophagus

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