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Welcome Address

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III International Congress of Einstein Robotic Thoracic Surgery and II Einstein International Symposium on Thoracic Oncology

The *Hospital Israelita Albert Einstein* through its Surgery and Oncology Programs is organizing the 3rd International Congress of Einstein Robotic Thoracic Surgery and 2nd Einstein International Symposium on Thoracic Oncology. This meeting, which is aimed for thoracic surgeons and medical oncologists with focus in thoracic oncology, has been successful since its first edition. The program discusses cutting-edge technologies for thoracic surgery and new treatments for lung cancer; furthermore, it includes speakers who are national and international leaders in their field of expertise.

The surgical program is very focused in robotic technologies and involves a live procedure and many surgical videos showing technical details of complex procedures. Moreover, we will have session addressing new techniques and technologies for lung and non-lung thoracic surgery. The medical oncology program will discuss the latest evidence regarding precision oncology in lung cancer and other thoracic tumors.

There will be some innovations in our event this year. First, we will be presenting scientific abstracts, two as oral presentations and fifteen as posters. The submitted and approved abstracts are very interesting, and our purpose is to foster scientific investigation in the field and promote discussion on these so relevant topics. Second, we merged surgery and medical oncology in a single multidisciplinary session on Friday afternoon, when we will have some keynote lectures and real cases discussion in a tumor board format. Finally, we also designed a course dedicated to advanced bronchoscopy in which we will perform a live endobronchial ultrasound (EBUS) and have lectures on new procedures as the use of cone-beam for navigation, robotic bronchoscopy and endoscopic ablation.

Moreover, the graduation of our robotic thoracic surgery students will take place during the meeting, and we'll hold sessions to bring alumni to present their experience. We are sure that in addition to the strong scientific program, this event will be a great networking experience for our attendees!

The Organizing Committee

Editorial

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Robotic thoracic surgery in Brazil

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Robotic surgery allows for better visualization and better handling of tissues during procedures because of the 3D view and articulated instruments which have more degrees of freedom than our own human wrist. Consequently, it is apparently easier to learn than other modalities of minimally invasive surgery (videoassisted thoracic surgery – VATS) and allows more surgeons to perform more complex procedures, particularly those that require bronchovascular sutures or reconstruction. Contributing for this assumption, recent studies have demonstrated that when compared to VATS, robotic surgery was associated with less frequent conversions, and most of the times, the additional VATS conversions were due to challenging anatomies that could have been more easily managed with the robotic plataform.[1]

The first robotic procedures in Brazil were performed in 2008, but the first robotic thoracic robotic procedures were performed in 2010. Since then, we observed a very slow growth of thoracic robotic surgery numbers until 2015 when more platforms arrived, and more thoracic surgeons were trained.[2,3] From, 2015 until 2020 the number of cases performed increased substantially following a greater number of trained surgeons and platforms available. However, from 2021 on, we see a very significant acceleration in the number of thoracic robotic cases performed in Brazil due to several reasons as the increase in the number of platforms, better commercial arrangements, and most importantly the large number of newly trained surgeons since the training process was brought to Brazil and so, the surgeons did not have to go abroad for certification anymore.

In 2024, we are aware that there are more than 100 thoracic surgeons that have the minimal documentation to perform robotic surgery and it is estimated that some 1500 to 2000 thoracic robotic procedures have been performed yearly. However, the challenges to start and keep a successful program are huge. The certification process nowadays regulated by the medical societies is very limited and many surgeons are reluctant to start their programs after finishing these short courses, particularly when they are at institutions where

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there is no active robotic thoracic surgery program. This fact puts a higher pressure in the need for proctors, once theses surgeons usually need more supervision and mentorship. Following initial training, proctorship is another big challenge. According to the requisites for definitive certification in robotic surgery by the medical societies, the definitive certificate is only given after a minimum of 10 supervised procedures. Unfortunately, we still do not have enough proctors in Brazil to attend to the high demand of newly trained thoracic robotic surgeons in the need for proctorship. Lack of funding is another issue, and the cost associated with proctorship many times must be paid by the patient or the surgeon. To make things still more complicated, in a recent study we demonstrated the importance of specialized proctors and the fact that after the end of the proctoring period it should be considered that a proctor participated sporadically in more challenging cases,[4] this would increase patients' safety. Therefore, the need for proctors goes probably beyond the ten cases. Lastly, the biggest challenge is the cost associated with the platform and supplies. Many institutions are struggling to find new models to make the process to be sustainable since the government and private health plans do not cover robotic surgery yet. Nowadays, patients have to pay out of the pocket for robotic surgery or hospitals somehow subsidize the operations. The definitive solution should include lower prices and that robotic surgery was incorporated to the list of approved procedures by all payers.

Another important topic is social justice. Currently, robotic surgery has been performed in patients who can pay for this expensive procedure. Considering the superior outcomes, it is widening even more the healthcare quality gap between more affluent and more vulnerable people. Therefore, we must find strategies to implement robotic thoracic surgery in more public institutions so that more patients could have access to this type of technology. Some institutions have already started programs dedicated to public patients like *Instituto do Cancer do Estado de São Paulo* (ICESP), *Hospital Municipal da Vila Santa Catarina Dr. Gilson de Cássia Marques de Carvalho*, and *Hospital de Amor de Barretos* and are doing a great job for their community. In addition to improved care, the platforms in such institutions increase the exposure of residents to robotic surgery and allows that they be trained in the technique.

As for clinical research in robotic surgery in Brazil, there is still much room for improvement. There are only a few publications in literature, most coming from our group and involving case reports and case series.[5-13] It is very important that Brazilian surgical scientists become more involved in robotic surgery and embrace research in the field so that we can develop new solutions tailored to the needs of our patients and our country. Funding and expertise are barriers we should overcome though. We must find ways to stimulate de development of innovations, new patents, new procedures, and health outcomes research.

As mentioned previously education is a big issue. Most residency programs do not have robotic platforms and residents have no exposure to the technology. Certification courses are short and give students some exposure to simulators and to the platform but are in essence limited to allow them a smooth adoption of the technique. To fill this gap, the Surgery Program at Albert Einstein created a graduate course in thoracic robotic surgery in which students have exposure to at least 150 hours of lectures, virtual simulation, crises resource management, dry lab, clinical observation of cases and possibility of case supervision. This is a very comprehensive one-year program that has already trained more than one hundred surgeons from Brazil, many countries in Latin America, and even India. Some consider it long and expensive though. Another option is the Einstein Fellowship in Thoracic Robotic Surgery. This is also a one-year program in which students have exposure to more than one hundred robotic procedures and perform at least 10-20 cases.[14] The downside of this program is the fact that it demands full dedication and is more adequate for those who finished the thoracic surgery residency recently. Internationally, these fellowship programs are the most popular training opportunities, even though in USA and some European countries, robotic surgery is already integrated in some residency programs, what should be our final goal as

well. Continued education is also very important, as well as refinement of surgical techniques. Currently, we see several opportunities for continued medical education with events and courses promoted by the robotic companies, medical societies and health care institutions.

In conclusion robotic thoracic surgery started in Brazil in 2010, and despite the slow growth initially it is now increasing in numbers exponentially. Nonetheless, at the moment, there are three big challenges we must overcome for a wider and safer adoption of the technique in our country: certification/training, supervision/proctorship, and cost. Addressing these three challenges altogether with equal distribution of robotic procedures, research and innovation tailored to our needs, and continued education should be a priority for all players involved in the care thoracic surgery patients.

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- Gustavo Schvartsman - Clinical Oncologist, *Hospital Israelita Albert Einstein, São Paulo, SP, Brazil.*
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- Sérgio Eduardo Alonso Araújo - Surgical Medical Director, *Hospital Israelita Albert Einstein, São Paulo, SP, Brazil.*

Speakers

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International Speakers

Biagio Ricciuti

Dr. Biagio Ricciuti is a thoracic medical oncologist, and Staff Scientist at the Lowe Center for Thoracic Oncology at the Dana-Farber Cancer Institute. He authored more than 160 publications in international peer-reviewed journals and received numerous international awards. His clinical and translational research focus is on the genomic mechanism of response and resistance to PD-(L)1 blockade and targeted therapies in non-small cell lung cancer.

Daniel Alberto Staltari

Thoracic surgery consultant specialist. Member of the argentine society of thoracic surgery. Fellow of the ACS. ATLS instructor.

Daniel Oh

Daniel Oh, MD is a thoracic surgeon with a focus in robotic-assisted surgery research and education. He is an associate professor of surgery at the University of Southern California (USC) in Los Angeles, California and is also a VP and associate medical officer at Intuitive Surgical, where he focuses on various research and training initiatives. He obtained his surgical training at USC and Brigham and Women's Hospital/Harvard Medical School. He has been performing robotic surgery (da Vinci) since 2011 and robotic bronchoscopy (Ion) since 2021. Currently he splits time between his clinical work and his work at Intuitive.

Diego Hernando Pardo Pinzon

General surgeon from the Pontificia Universidad Javeriana in Bogota. In this city he also did a specialization in thoracic surgery at the Universidad El Bosque, with training in lung transplantation at the Valle de Hebron Hospital in Barcelona, Spain.

Kelvin Lau

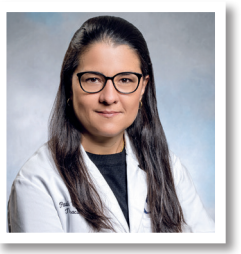
Kelvin Lau is clinical director and consultant thoracic surgeon at St Bartholomew's Hospital in London. He built the thoracic surgery unit with a full-time robotic surgery and navigation bronchoscopy programme. He performed the first endobronchial microwave ablation of lung tumour in February 2018.

Lana Y. Schumacher-Beal

Dr. Lana Schumacher is the Chief of Thoracic Surgery and Director of the Center for Innovation at the Tufts Medical Center. Dr. Schumacher serves as Chair of the robotic task for the Society of Thoracic Surgeons and runs a scholarship for the Women in Thoracic Surgery for Robotic surgery training. Dr. Schumacher's research focuses are on the utilization of artificial intelligence for deep dive analysis of neural networks for robotic thoracic surgery and the use of machine learning and virtual reality in medical education for surgery.

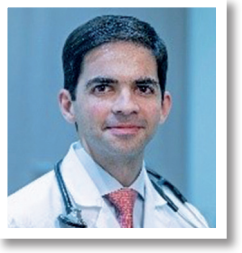
Maria Eugenia Gillem Zeballos

Head of the department of the National Institute of Neoplastic Diseases, Peru; Thoracic and Cardiovascular Surgeon - Oncologic Surgeon; President of the Peruvian Society of Cancerology.



Paula Antonia Ugalde Figueroa

Physician in Chief for Thoracic Surgery, Southcoast Health Surgery Care Center; Associate Professor of Surgery, Harvard Medical School.



Fernando Santini

Assistant Clinical Member at Memorial Sloan Kettering Cancer Center and Assistant Professor of Clinical Medicine at Weill Cornell Medical Center, New York.

National Speakers

Addy Lidvina Mejia Palomino

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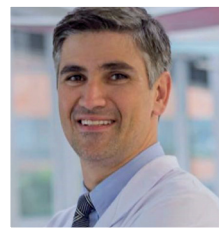

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Gustavo Santiago Melhim Gattás

Staff Thoracic Surgeon at the *Instituto Nacional de Câncer* (INCA); Full member of the *Sociedade Brasileira de Cirurgia* Torácica (SBCT); Member of the *Sociedade Brasileira de Cirurgia Oncológica* (SBCO); Area of interest and expertise in tracheal surgery, oncological thoracic resections, and minimally invasive techniques (video thoracoscopy and robotics).

Gustavo Schvartsman

Medical Oncologist at *Hospital Israelita Albert Einstein*, Fellowship in Clinical Oncology at MD Anderson Cancer Center, PhD at *Hospital Israelita Albert Einstein.*

Helano Carioca Freitas

Vice-leader of the Lung and Chest Tumors Reference Center. He graduated in Medicine (1993-1998) and completed a residency in Internal Medicine (1999-2001) and a master's degree in Pharmacology at the *Universidade Federal do Ceará* (UFC) (2004-2007). He trained in Oncology at the *A.C.Camargo Cancer Center*, where he did his residency in Clinical Oncology (2001-2004) and completed his doctorate (2015-2019).

Hyroan Brandell Pereira Correa

Thoracic Surgeon - *Instituto do Coração, Hospital das Clínicas, Faculdade de Medicina, Universidade de São Paulo* (InCor HCFMUSP). Fellowship in Robotic Surgery - *Hospital Israelita Albert Einstein*.

Junis Suzuki

Specialization in Bronchoscopy at the National Cancer Center in Tokyo - Japan; PhD in Pulmonology; Previous positions: physician at the Bronchoscopy Service of the *Escola Paulista de Medicina, Universidade Federal de São Paulo* (EPM-UNIFESP) until 2015 and at the Bronchoscopy Service of the *Hospital A. C. Camargo* until 2022; currently physician at the Bronchoscopy Service of the *Hospital Israelita Albert Einstein*.

Jefferson Luiz Gross

Master's and PhD in Oncology from *Faculdade de Medicina*, *Universidade de São Paulo* (FMUSP). Leader of the Lung and Chest Center at *the A.C. Camargo Cancer Center.*

João Paulo Simões Dutra

Fellowship in Robotic Surgery - *Hospital Israelita Albert Einstein*.

José de Jesus Camargo

Thoracic surgeon; MSc and PhD in Medicine from *Universidade Federal do Rio Grande do Sul*; Professor Emeritus at *Universidade Federal de Ciências da Saúde de Porto Alegre*; Pioneer in Lung Transplantation in Latin America. Director of Thoracic Surgery and the Transplant Center at *Santa Casa de Porto Alegre*. Former President of the *Sociedade Brasileira de Cirurgia Torácica*; Full Member of the National Academy of Medicine.

José Ribas Milanez de Campos

Full professor of thoracic surgery at the *Hospital das Clínicas*, *Faculdade de Medicina*, *Universidade de São Paulo* (HCFMUSP) and attending physician of the backup team of specialists in thoracic surgery at the *Hospital Israelita Albert Einstein.*

Laert de Oliveira Andrade Filho

Graduated from the *Faculdade de Medicina, Universidade de São Paulo* (FMUSP). Founding member of the *Sociedade Brasileira de Cirurgia Torácica* (SBCT). Chest surgeon at *Hospital Israelita Albert Einstein.*

Leonardo Pontual Lima

Thoracic Surgeon, *Hospital das Clínicas, Faculdade de Medicina, Universidade de São Paulo* (HCFMUSP). Specialist in Thoracic Oncology and Minimally Invasive Surgery at the *Instituto do Câncer do Estado de São Paulo* (ICESP). Fellowship in Robotic Thoracic Surgery at the *Instituto D'Or de Pesquisa e Ensino* (IDOR). Thoracic Surgeon at *Pronto-Socorro Cardiológico Universitário de Pernambuco* (PROCAPE) and *Real Hospital Português*.

Leonardo Rottili Roeder

Thoracic Surgeon with a post-graduate degree in Robotic Thoracic Surgery. He works at the *Hospital São Marcelino Champagnat* in Curitiba, Paraná. He specialized in Thoracic Surgery at the *Hospital Universitário Cajuru* and is currently a preceptor in the medical residency specialty.

Leticia Leone Lauricella

Thoracic Surgeon. Collaborating professor of thoracic surgery at the *Hospital das Clínicas, Faculdade de Medicina*, *Universidade de São Paulo* (HCFMUSP), *Instituto do Câncer do Estado de São Paulo* (ICESP). PhD in thoracic surgery from the FMUSP.

Marcelo Gervilla Gregorio

Pulmonologist with a specialty in sleep. Respiratory endoscopist. Doctorate in Health Sciences.

Márcia Jacomelli

Pulmonologist and PhD in Sciences from the *Universidade de São Paulo* (USP). Coordinator of the Respiratory Endoscopy Center at *Hospital Israelita Albert Einstein* and Medical Supervisor of the Respiratory Endoscopy Service at the *Instituto do Coração, Hospital das Clínicas*, *Faculdade de Medicina, Universidade de São Paulo* (InCor HCFMUSP).

Maria Teresa Tsukazan Schwarz

Professor at *Pontifícia Universidade Católica do Rio Grande do Sul* (PUCRS) School of Medicine; Head of Thoracic Surgery at *Hospital São Lucas* of the PUCRS and Thoracic Surgeon at *Hospital Moinhos de Vento*.

Mariana Canevari de Oliveira

Master's Degree in Surgical Sciences from the *Universidade Estadual de Campinas* (UNICAMP). Postgraduate degree in Robotic Thoracic Surgery from the *Instituto Israelita de Ensino e Pesquisa Albert Einstein*, *Hospital Israelita Albert Einstein*. Thoracic Surgery and General Surgery from UNICAMP.

Mariana Rodrigues Cremonese

Graduated from the *Universidade do Vale do Itajaí* – Santa Catarina. Residency in General Surgery - *Instituto Israelita de Ensino e Pesquisa Albert Einstein, Hospital Israelita Albert Einstein*. Specialization in Airway Surgery and Respiratory Endoscopy - *Universidade de São Paulo* (USP). Member of the Thoracic Surgery Specialists/Backup team at the main hospitals in São Paulo, such as *Hospital Israelita Albert Einstein*, *Hospital São Luiz* - Morumbi, among others.

Mario Claudio Ghefter

Full member of the *Sociedade Brasileira de Cirurgia Torácica* (SBCT); Member of the Minimally Invasive Surgery Commission of the SBCT Secretary General of the SBCT for the 2017-2019 financial year. With a keen interest in minimally invasive surgery, he introduced the method to Brazil in 1991. Since then he has participated in the training of thoracic surgeons in regular courses on the subject. He has participated in the development and improvement of various techniques in the area of minimally invasive surgery, with an emphasis on pulmonary lobectomies and the videothoracoscopic surgical treatment of Thoracic Outlet Syndrome.

Miguel Cendoroglo Neto

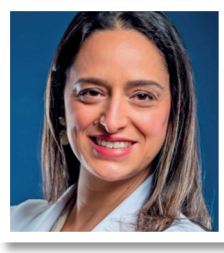
Medical Director and Superintendent of *Hospital Israelita Albert Einstein*. He is currently Associate Professor at the *Universidade Federal de São Paulo* (UNIFESP), Adjunct Assistant Professor at Tufts University School of Medicine (Boston) and Adjunct Professor on the Executive MBA in Health Management at *Instituto de Ensino e Pesquisa* (Insper), in partnership with *Hospital Israelita Albert Einstein*.

Nam Jin Kim

Medical Director Oncology of *Hospital Israelita Albert Einstein*.

Oren Smaletz

He graduated in Medicine from the Medical School of the *Universidade de São Paulo* (USP) (1995), with a residency in Clinical Medicine from the *Hospital das Clínicas*, *Universidade de São Paulo* (HCUSP) (1996-1998) and specialization in Clinical Oncology from the Memorial Sloan Kettering Cancer Center in New York (1999-2002). He is currently a clinical oncologist at *Hospital Israelita Albert Einstein*.



Patrícia Taranto

Medical oncologist at *Hospital Israelita Albert Einstein* and *Hospital Municipal da Vila Santa Catarina Dr. Gilson Cássia Marques de Carvalho; Hospital Israelita Albert Einstein*. Member of the precision medicine program at *Hospital Israelita Albert Einstein.*

Paula Duarte D'ambrosio

Specialist in thoracic oncology surgery at the *Instituto do Câncer do Estado de São Paulo* (ICESP), *Faculdade de Medicina, Universidade de São Paulo* (FMUSP). Fellow in robotic thoracic surgery at the *Hospital Israelita Albert Einstein*.

Paulo Manuel Pêgo-Fernandes

Vice-Director of the *Faculdade de Medicina*, *Universidade de São Paulo* (FMUSP); Director of the Thoracic Surgery Division of the *Instituto do Coração*, *Hospital das Clínicas*, *Faculdade de Medicina*, *Universidade de São Paulo* (InCor HCFMUSP); Full Professor of the Cardiopneumology Department of the FMUSP; Member of the Advisory Board of *Associação Brasileira de Transplante de Órgãos* (ABTO); First Treasurer of *Academia de Medicina de São Paulo* (AMSP); Scientific Director of *Associação Paulista de Medicina* (APM).

Paulo Rogério Scordamaglio

Physician in the *Hospital Israelita Albert Einstein* respiratory endoscopy team *Associação de Medicina Intensiva Brasileira* (AMIB)/ *Associação Médica Brasileira* (AMB) adult intensive care specialist. Respiratory Endoscopy specialist by *Sociedade Brasileira de Cirurgia Torácica* (SBCT)/ *Associação Médica Brasileira* (AMB). Professor of Medicine at *Universidade Santo Amaro*. PhD in Health Sciences (Concentration in Thoracic Surgery) from the *Faculdade de Medicina*, *Universidade de São Paulo* (FMUSP).

Paulo Vidal Campregher

Dr. Paulo Campregher is a hematologist and molecular pathologist, coordinator of precision laboratory medicine for Albert Einstein diagnostic medicine and is a permanent professor at the Postgraduate Program in Health Sciences *Faculdade Israelita de Ciências da Saúde Albert Einstein, Hospital Israelita Albert Einstein.*

Pedro Henrique Cunha Leite

Thoracic Surgeon at *Hospital das Clínicas*, *Faculdade de Medicina*, *Universidade de São Paulo* (HCFMUSP); Fellowship in Oncological and Minimally Invasive Thoracic Surgery at the *Instituto do Câncer do Estado de São Paulo* (ICESP)/HC-FMUSP; Fellowship in Robotic Thoracic Surgery at *Instituto D'Or de Pesquisa e Ensino* (IDOR); Director of the Thoracic Surgery Center of the *Instituto Baiano de Cirurgia Robótica* (IBCR).

Ricardo Lopes Moraes de Oliveira

Head of the Thoracic Surgery Service at *Hospital Santa Izabel* – Salvador, Bahia. Thoracic Surgeon at Grupo CirTórax and *Núcleo de Oncologia da Bahia/Oncoclínicas.*

Ricardo Mingarini Terra

Full Professor of Thoracic Surgery at the *Universidade de São Paulo* (USP); Head of the Thoracic Surgery Service at the *Instituto do Câncer do Estado de São* Paulo (ICESP); Coordinator of the Thorax Center of Excellence at *Hospital Israelita Albert Einstein.*

Samuel Padovani Steffen

Cardiovascular Surgeon at *Instituto do Coração, Hospital das Clínicas, Faculdade de Medicina, Universidade de São Paulo* (InCor FMUSP); InCor Surgery Division / InCor Transplant Center Robotic cardiovascular surgery enthusiast.

Sérgio Eduardo Alonso Araujo

Medical Director Surgery of *Hospital Israelita Albert Einstein*.

Sérgio Tadeu Lima Fortunato

President of the *Sociedade Brasileira de Cirurgia Torácica* (SBCT) 2017/2021. Coordinator of CirTórax - Salvador/Bahia.

Sidney Klajner

Sidney Klajner is a Digestive System Surgeon. He holds a medical degree and a master's degree from the *Faculdade de Medicina* of the *Universidade de São Paulo* (FMUSP), a medical residency from the *Hospital das Clínicas, Faculdade de Medicina*, *Universidade de São Paulo* (HCFMUSP), a fellow of the American College of Surgeons. President of the *Sociedade Beneficente Israelita Brasileira Albert Einstein.*

Vladmir Cláudio Cordeiro de Lima

Clinical Oncologist - Thoracic and Breast Tumors - Department of Clinical Oncology – *A.C. Camargo Cancer Center.* Associate Researcher – *A.C. Camargo Cancer Center*. PhD in Oncology - *Fundação Antônio Prudente*. Director of the Brazilian Thoracic Oncology Group; Technical-Scientific Advisor - Oncology - *Grupo Hermes Pardini.*

Wolfgang William Schmidt Aguiar

Full member of the *Sociedade Brasileira de Cirurgia Torácica* (SBCT) and the CBC. Head of the Thoracic Surgery Services at the *Hospital das Clínicas*, *Universidade Federal de Pernambuco* (HC-UFPE) and the *Hospital Universitário Oswaldo* Cruz, *Universidade de Pernambuco* (HUOC-UPE). Founding partner of the Recife Thoracic Surgery Service.

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Scientific Program

III International Congress of Einstein Robotic Thoracic Surgery					
June 27-29, 2024					
June 27th, 2024 | Thursday					
Start time	**Finish time**	**Activity**	**Presenter/ Moderator**	**Speaker/ Moderator's name**	**Institution**
07:50	08:00	Opening Session	Presenter	Sidney Klajner	Sociedade Beneficente Israelita Brasileira Albert Einstein
			Presenter	Miguel Cendoroglo Neto	Hospital Israelita Albert Einstein
			Presenter	Ricardo Mingarini Terra	Hospital Israelita Albert Einstein
			Presenter	José Ribas Milanez de Campos	Hospital Israelita Albert Einstein
			Presenter	Sérgio Eduardo Alonso Araujo	Hospital Israelita Albert Einstein
08:00	10:00	3D LIVE SURGERY: LUNG SEGMENTECTOMY	Surgeon	Ricardo Mingarini Terra	Hospital Israelita Albert Einstein
			Facilitator	Alessandro Wasum Mariani	Hospital Israelita Albert Einstein
			Facilitator	José Ribas Milanez de Campos	Hospital Israelita Albert Einstein
			Debater	Francisco Martins Neto	Hospital de Messejana
			Remote Debater	Maria Teresa Tsukazan Schwarz	Hospital Moinhos de Vento and Hospital São Lucas at PUC-RS
			Debater	Leonardo Pontual Lima	Real Hospital Português
			Debater	Fabio Jose Haddad	Hospital Sirio-Libanês
10:00	10:30	Coffee Break			
10:30	12:30	TABLE: UPDATES ON ROBOTIC LUNG SURGERY	Moderator	Eduardo de Campos Werebe	Hospital Israelita Albert Einstein
			Moderator	Wolfgang William Schmidt Aguiar	SECITOR - Serviço de Cirurgia Torácica de Recife
			Moderator	Diego Hernando Pardo Pinzon	Clinica Portoazul, Clinica Centro
10:30	10:45	Segmentectomies: What are the most common variations and what are the most risky?	Speaker	Eserval Rocha Júnior	Instituto do Câncer do Estado de São Paulo
10:45	11:00	Station 4L Lymphadenectomy: how to perform it and how to avoid complications?	Speaker	Flávio Brito Filho	Sociedade Brasileira de Cirurgia Torácica
11:00	11:15	Auxiliary Portal: Complications and how to avoid them	Speaker	Leticia Leone Lauricella	Instituto do Câncer do Estado de São Paulo
11:15	11:30	Single-Port Robotic Thoracic Surgery	International Speaker	Paula Antonia Ugalde Figueroa	Harvard Medical Scool
11:30	11:45	Image guided robotic surgery: connecting technologies	International Speaker	Kelvin Lau	St Bartholomew's Hospital
11:45	12:00	Bulldogs or Tourniquets? What is the best alternative for vascular control?	Speaker	Ricardo Mingarini Terra	Hospital Israelita Albert Einstein
12:00	12:30	Satellite Symposium Roche:	Speaker	Ricardo Mingarini Terra	Hospital Israelita Albert Einstein
		Precision Thoracic Oncology: Discussion and Clinical Case	Speaker	Fernando Moura	Hospital Israelita Albert Einstein
12:30	13:10	Satellite Symposium Roche: Precision Thoracic Oncology: Discussion and Clinical Case	Speaker Speaker	Ricardo Mingarini Terra Fernando Moura	Hospital Israelita Albert Einstein Hospital Israelita Albert Einstein
13:10	13:50	Satellite Symposium Fujifilm: 3D reconstructions for surgical planning of lung segmentectomies			
13:40	14:00	Break			

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June 27th, 2024 | Thursday					
Start time	**Finish time**	**Activity**	**Presenter/ Moderator**	**Speaker/ Moderator's name**	**Institution**
14:00	16:00	TABLE: ADVANCES IN ROBOTIC SURGERY (DIGITAL ACADEMY)	Moderator	Paulo Manuel Pêgo-Fernandes	Instituto do Coração, Hospital das Clínicas, Faculdade de Medicina, Universidade de São Paulo
			Moderator	Jefferson Luiz Gross	A.C Camargo Cancer Center
			Remote Moderator	Darcy Ribeiro Pinto Filho	Hospital Geral - Fundação Universidade de Caxias do Sul
14:00	14:20	Robotic Thoracic Surgery: Where are we headed?	International Speaker	Daniel Oh	University of Southern California and Intuitive
14:20	14:40	Technology and the quest for excellence in thoracic surgery	Speaker	Ricardo Mingarini Terra	Hospital Israelita Albert Einstein
14:40	15:00	Robotic surgery in complex cases	International Remote Speaker	Lana Y. Schumacher-Beal	Tufts Medical Center
15:00	15:10	Underutilization of adjuvant therapy in resected IB-III non-small-cell lung cancer risk model - analysis from the brazilian registry of lung cancer	Presenter	Andessa Hirome Amaral Kauano	
15:10	15:20	Accelerated Recovery Program - Thoracic surgery	Presenter	Juliana Vieira de Oliveira Salerno	
15:20	16:00	Discussion			
16:00	16:30	Coffee Break			
16:30	18:00	EINSTEIN ALUMNI SESSION	Moderator	José Ribas Milanez de Campos	Hospital Israelita Albert Einstein
			International Moderator	Daniel Oh	University of Southern California and Intuitive
			International Moderator	Kelvin Lau	St Bartholomew's Hospital
16:30	16:45	Arterioplasty	Speaker	Giovani Waltrick Mezzalira	Clinica Toraco Pulmonar
16:45	17:00	Robotic mitral valve repair	Speaker	Samuel Padovani Steffen	Instituto do Coração, Hospital das Clínicas, Faculdade de Medicina, Universidade de São Paulo
17:00	17:15	Carinoplasty	Speaker	Mariana Canevari de Oliveira	Universidade Estadual de Campinas
17:15	17:30	Robotic left upper lobestomy	Speaker	Gustavo Bandeira	Hospital ViValle
17:30	17:45	Thymectomy from the left with visualization of the right phrenic	Speaker	Leonardo Rottili Roeder	Hospital São Marcelino Champagnat
17:45	18:00	Robot esophagectomy	International Speaker	Daniel Alberto Staltari	División Cirugía Clínica Colon
18:00	19:00	KEYNOTE LECTURE	Moderator	Artur Gomes Neto	Santa Casa de Misericórdia de Maceió
18:00	18:45	Technology, Innovation and the Patient	Speaker	José de Jesus Camargo	Hospital Moinhos de Vento
18:45	19:00	Discussion			
19:00	20:00	Einstein International Robotic Thoracic Surgery Graduate Ceremony	Opening Session	Nan Jim Kim	Hospital Israelita Albert Einstein
			Opening Session	Carlos Daudt	Instituto de Cirurgia Robótica

III International Congress of Einstein Robotic Thoracic Surgery II Einstein International Symposium on Thoracic Oncology					
June 27-29, 2024					
June 28th, 2024 | Friday					
III International Congress of Einstein Robotic Thoracic Surgery (Place: Camilla Bueno Auditórium)					
Start time	**Finish time**	**Activity**	**Presenter/ Moderator**	**Speaker/ Moderator's name**	**Institution**
08:00	10:00	TABLE: ROBOTIC THORACIC NON-PULMONARY SURGERY	Moderator	Pedro Henrique Cunha Leite	Hospital MaterDei - Salvador
			Moderator	Mario Claudio Ghefter	Hospital Israelita Albert Einstein
			Moderator	Maria Eugenia Gillem Zeballos	Instituto Nacionla de Efermedades Neoplasicas
08:00	08:15	Subxiphoid Access	International Speaker	Paula Antonia Ugalde Figueroa	Harvard Medical Scool
08:15	08:30	Anatomical variations of the thymus and their impact on robotic surgery	Speaker	Alessandro Wasum Mariani	Hospital Israelita Albert Einstein
08:30	08:45	Strategies for robotic diaphragm plication	Speaker	Eduardo Sperb Pilla	Hospital Moinhos de Vento
08:45	09:00	First rib resection	International Speaker	Lana Y. Schumacher-Beal	Tufts Medical Center
09:00	09:15	New robotic platform: Hugo System	Speaker	Ariê Carneiro	Hospital Israelita Albert Einstein
09:15	09:30	Apps for education and performance monitoring	International Speaker	Daniel Oh	University of Southern California and Intuitive
09:30	10:00	Discussion			
10:00	10:30	Coffee Break			
10:30	12:30	VIDEO SESSION: CHALLENGES IN ROBOTIC THORACIC SURGERY	Moderator	Ricardo Mingarini Terra	Hospital Israelita Albert Einstein
			International Moderator	Daniel Oh	University of Southern California and Intuitive
			Moderator	Sérgio Tadeu Lima Fortunato	CirTórax
10:30	10:45	Lobectomy after Immunotherapy	Speaker	Davi Wen Wei Kang	Hospital Israelita Albert Einstein
10:45	11:00	S2+S4 Segmentectomy	Speaker	Hyroan Brandell Pereira Correa	Hospital Israelita Albert Einstein
11:00	11:15	Middle lobectomy with bronchial suture	Speaker	João Paulo Simões Dutra	Hospital das Clínicas da Faculdade de Medicina (Universidade Federal de Goiás)
11:15	11:30	Robotic lobectomy without staplers	Speaker	Gustavo Santiago Melhim Gattás	Instituto Nacional de Câncer
11:30	11:45	Subxiphoid access: technical details	Speaker	Fábio Eiti Nishibe Minamoto	Hospital Israelita Albert Einstein
11:45	12:00	HITHOC and robotic surgery	Speaker	Paula Duarte D'Ambrosio	Hospital Israelita Albert Einstein
12:00	12:30	Discussion			
12:30	13:00	Satellite Symposium Janssen			
13:00	13:40	Satellite Symposium Daiichi Sankyo: New perspectives for the HER2 patient in NSCLC	Speaker Speaker	Paulo Vidal Campreger Guilherme Malandrini Andreatti	Hospital Israelita Albert Einstein Hospital Israelita Albert Einstein
13:40	14:00	Break			

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III International Congress of Einstein Robotic Thoracic Surgery II Einstein International Symposium on Thoracic Oncology (Place: Camilla Bueno Auditórium)					
Start time	**Finish time**	**Activity**	**Presenter/ Moderator**	**Speaker/ Moderator's name**	**Institution**
14:00	16:00	TABLE: THORACIC ONCOLOGY OF THE FUTURE (DIGITAL ACADEMIA)	Moderator	Ricardo Mingarini Terra	Hospital Israelita Albert Einstein
			Moderator	Gustavo Schvartsman	Hospital Israelita Albert Einstein
			Moderator	Fernando Moura	Hospital Israelita Albert Einstein
14:00	14:05	Posters			
14:05	14:15	Why robotic surgery is changing the landscape of oncological thoracic surgery?	International Speaker	Daniel Oh	University of Southern California and Intuitive
14:15	14:30	Perioperative Treatments: State of the art	Speaker	Gustavo Schvartsman	Hospital Israelita Albert Einstein
14:30	14:45	Immunotherapy in early-stage lung cancer: perspective of the thoracic surgeon	International Speaker	Paula Antonia Ugalde Figueroa	Harvard Medical Scool
14:45	15:00	Liquid Biopsy: from screening to detection of minimal residual disease	Speaker	Fernando Moura	Hospital Israelita Albert Einstein
15:00	15:15	Endobronchial treatment of lung cancer	International Speaker	Kelvin Lau	St Bartholomew's Hospital
15:15	15:30	Neoadjuvant platforms: how to expedite clinical development	International Speaker	Biagio Ricciuti	Dana-Farber Cancer Institute
15:30	16:00	Discussion			
16:00	16:30	Coffee Break			
16:30	17:00	Satellite Symposium MSD			
17:00	18:00	INTERACTIVE TUMOR BOARD	Debater	Ricardo Mingarini Terra	Hospital Israelita Albert Einstein
			Debater	Gustavo Schvartsman	Hospital Israelita Albert Einstein
			Debater	Fernando Moura	Hospital Israelita Albert Einstein
			International Debater	Paula Antonia Ugalde Figueroa	Harvard Medical Scool
		Case Presentation	Presenter	Patrícia Taranto	Hospital Israelita Albert Einstein
			Presenter	Alessandro Wasum Mariani	Hospital Israelita Albert Einstein

III International Congress of Einstein Robotic Thoracic Surgery II Einstein International Symposium on Thoracic Oncology					
June 27-29, 2024					
June 28th, 2024 | Friday					
II Einstein International Symposium on Thoracic Oncology (Place: Class Room - CEP | Teaching and Research Center Camilla Bueno Auditorium)					
Start time	**Finish time**	**Activity**	**Presenter/ Moderator**	**Speaker/Moderator's name**	**Institution**
08:00	08:20	ALK Inhibitor Sequencing: Variants, Resistance Mutations and Toxicity	International Speaker	Fernando Santini	Memorial Sloan Kettering Cancer Center
08:20	08:40	Evolution of first-line treatment for NSCLC with EGFR mutation	Speaker	Vladmir Cláudio Cordeiro de Lima	A.C. Camargo Cancer Center
08:40	09:00	How to circumvent osimertinib failure in EGFR-mutated patients	Speaker	Oren Smaletz	Hospital Israelita Albert Einstein
09:00	10:00	Case Discussions	Moderator	Guilherme Malandrini Andriatte	Hospital Israelita Albert Einstein
			Debater	Oren Smaletz	Hospital Israelita Albert Einstein
			Debater	Vladmir Cláudio Cordeiro de Lima	A.C. Camargo Cancer Center
			International Debater	Fernando Santini	Memorial Sloan Kettering Cancer Center
10:00	10:30	Coffee Break			
10:30	10:50	First-line immunotherapy: which regimen and for whom?	Speaker	Fernando Moura	Hospital Israelita Albert Einstein
10:50	11:10	When to use immunotherapy in patients with driver mutations	International Speaker	Biagio Ricciuti	Dana-Farber Cancer Institute
11:10	11:40	Satellite Symposium Amgen: Treatment of small cell lung cancer: current scenario and prospects for the future	Speaker	Gustavo Schvartsman	Hospital Israelita Albert Einstein
			Speaker	Ana Caroline Zimmer Gelatti	Grupo Oncoclínicas and Hospital São Lucas PUC/RS
11:40	12:30	Case Discussion	Moderator	Helano Carioca Freitas	A.C.Camargo Cancer Center
			Debater	Fernando Moura	Hospital Israelita Albert Einstein
			International Debater	Biagio Ricciuti	Surgery Care Center Southcoast Health
			Debater	Gustavo Schvartsman	Hospital Israelita Albert Einstein
			Debater	Ana Caroline Zimmer Gelatti	Grupo Oncoclínicas and Hospital São Lucas PUC/RS
12:30	13:00	Satellite Symposium Janssen			
13:00	13:40	Satellite Symposium Daiichi Sankyo: New perspectives for the HER2 patient in NSCLC	Speaker Speaker	Paulo Vidal Campreger Guilherme Malandrini Andreatti	Hospital Israelita Albert Einstein Hospital Israelita Albert Einstein

III International Congress of Einstein Robotic Thoracic Surgery					
June 27-29, 2024					
June 29th, 2023 | Saturday					
Start time	**Finish time**	**Activity**	**Presenter/ Moderator**	**Speaker/Moderator's name**	**Institution**
COURSE 01: BASICS OF ROBOTIC SURGERY					
08:00	10:00	THE ROBOTIC PLATFORM	Moderator	José Ribas Milanez de Campos	Hospital Israelita Albert Einstein
			Moderator	Laert de Oliveira Andrade Filho	Hospital Israelita Albert Einstein
08:00	08:20	Why robotic surgery	Speaker	Eduardo de Campos Werebe	Hospital Israelita Albert Einstein
08:20	08:40	Training and accreditation	Speaker	Alessandro Wasum Mariani	Hospital Israelita Albert Einstein
08:40	09:00	Robotic Platform	Speaker	Eduardo de Campos Werebe	Hospital Israelita Albert Einstein
09:00	09:20	How to start my robotics program	Speaker	Alessandro Wasum Mariani	Hospital Israelita Albert Einstein
09:20	09:40	How to implement an ERAS program	Speaker	Fabiano Cataldi Engel	Hospital Israelita Albert Einstein
09:40	10:00	Discussion			
10:00	10:30	Coffee Break			
10:30	12:30	ROBOTIC PROCEDURES	Moderator	Fabiano Cataldi Engel	Hospital Israelita Albert Einstein
			Moderator	Davi Wen Wei Kang	Hospital Israelita Albert Einstein
10:30	10:50	Positioning and docking	Speaker	José Ribas Milanez de Campos	Hospital Israelita Albert Einstein
10:50	11:10	Lobectomies	Speaker	Paulo Manuel Pêgo-Fernandes	Instituto do Coração, Hospital das Clínicas, Faculdade de Medicina, Universidade de São Paulo
11:10	11:30	Segmentectomies	Speaker	Leticia Leone Lauricella	Instituto do Câncer do Estado de São Paulo
11:30	11:50	Mediastinal tumor resection	Speaker	Alberto Jorge Monteiro Dela Vega	Instituto do Câncer do Estado de São Paulo
11:50	12:10	Other applications	Speaker	Alessandro Wasum Mariani	Hospital Israelita Albert Einstein
12:10	12:30	Discussion			
12:30	13:30	Break			
13:30	18:00	HANDS ON			
13:30	15:30	Hands On Virtual Simulation/In Service	Instructor	Alessandro Wasum Mariani	Hospital Israelita Albert Einstein
			Instructor	Eduardo de Campos Werebe	Hospital Israelita Albert Einstein
			Instructor	Laert de Oliveira Andrade Filho	Hospital Israelita Albert Einstein
			Instructor	Davi Wen Wei Kang	Hospital Israelita Albert Einstein
15:30	16:00	Coffee Break			
16:00	18:00	Hands On Virtual Simulation/In Service	Instructor	Alessandro Wasum Mariani	Hospital Israelita Albert Einstein
			Instructor	Eduardo de Campos Werebe	Hospital Israelita Albert Einstein
			Instructor	Laert de Oliveira Andrade Filho	Hospital Israelita Albert Einstein
			Instructor	Davi Wen Wei Kang	Hospital Israelita Albert Einstein
18:00		Closing remarks			

III International Congress of Einstein Robotic Thoracic Surgery					
June 27-29, 2024					
June 29th, 2023 | Saturday					
Start time	**Finish time**	**Activity**	**Presenter/ Moderator**	**Speaker/Moderator's name**	**Institution**
COURSE 2: ADVANCED ENDOSCOPIC TECHNIQUES IN THORACIC ONCOLOGY					
08:00	10:00	MODULE 1: ENDOBRONCHIAL ULTRASOUND (EBUS)	Moderator	Addy Lidvina Mejia Palomino	Hospital Israelita Albert Einstein
			Moderator	Benoit Jacques Bibas	Hospital Israelita Albert Einstein
08:00	09:00	Live EBUS	Speaker	Ricardo Mingarini Terra	Hospital Israelita Albert Einstein
			Speaker	Márcia Jacomelli	Hospital Israelita Albert Einstein
09:00	09:15	Significance of EBUS for diagnosis and staging of NSCLC	Speaker	Ricardo Lopes Moraes de Oliveira	Hospital Santa Izabel
09:15	09:30	Anatomy as applied to EBUS	Speaker	Eserval Rocha Jr.	Instituto do Câncer do Estado de São Paulo
09:30	09:45	Technical aspects for maximizing results	Speaker	Paulo Rogério Scordamaglio	Hospital Israelita Albert Einstein
09:45	10:00	Discussion			
10:00	10:30	Coffee Break			
10:30	12:30	MODULE 2: ENDOBRONCHIAL NAVIGATION	Moderator	Mariana Rodrigues Cremonese	Hospital Municipal Vila Santa Catarina
			Moderator	Altair da Silva Costa Junior	Universidade Federal de São Paulo/ Hospital Israelita Albert Einstein
10:30	10:45	Pulmonary nodule: diagnostic challenge	Speaker	Márcia Jacomelli	Hospital Israelita Albert Einstein
10:45	11:00	3D reconstruction for assisted navigation	Speaker	Eserval Rocha Júnior	Instituto do Câncer do Estado de São Paulo
11:00	11:15	Electromagnetic navigation	International Speaker	Kelvin Lau	St Bartholomew's Hospital
11:15	11:30	Cone-beam tomography in endodontics	Speaker	Ricardo Mingarini Terra	Hospital Israelita Albert Einstein
11:30	11:45	Robotic bronchoscopy	International Speaker	Kelvin Lau	St Bartholomew's Hospital
11:45	12:00	Cryo biopsy of lung nodule	Speaker	Marcelo Gervilla Gregorio	Hospital Israelita Albert Einstein
12:00	12:30	Discussion			
12:30	13:30	Break			
13:30	15:00	MODULE 3: ABLATIVE TECHNIQUES	Moderator	Felipe Nominando Diniz Oliveira	Hospital Israelita Albert Einstein
			Moderator	Guilherme Cayres Mariotti	Hospital Israelita Albert Einstein
13:30	13:45	Pathophysiological basis for ablative techniques	Speaker	Guilherme Moratti Gilberto	Hospital Israelita Albert Einstein
13:45	14:15	Cryoablation	International Speaker	Kelvin Lau	St Bartholomew's Hospital
14:15	14:30	Endobronchial Radiofrequency and Microwaves	Speaker	Fábio Eiti Nishibe Minamoto	Hospital Israelita Albert Einstein
14:30	14:45	Endobronchial chemo/immunotherapy	Speaker	Iunis Suzuki	Hospital Israelita Albert Einstein
14:45	15:00	Discussion			
15:00	15:30	Coffee Break			
15:30	17:00	New technologies showroom (Sectorial EBUS, Radial EBUS, Radiofrequency, Microwave, Cryoablation)	Speaker		
17:00		Closing remarks			

CONTENTS

Presentation Abstracts

001

Assessment of genomic variants and overall survival in primary tumor lung adenocarcinoma and corresponding mediastinal lymph nodes obtained by EBUS- TBNA

Caroline Silvério Faria[1,2], Camila Machado Baldavira[2], Tabatha Gutierez Prieto Martins Rocha[2], Viviane Rossi Figueiredo[3], Ellen Caroline Toledo do Nascimento[4], Evandro Sobroza de Mello[5], Murilo Castro Cervato[7], Ricardo Mingarini Terra[6], Vera Luiza Capelozzi[2], Leila Antonangelo[1,8]

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Introduction: Histopathological analyses and classification by the Tumor, Node, Metastasis System (TNM) are key-elements in therapeutic decision-making for non-small cell lung cancer (NSCLC).[1] Endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) is effective in obtaining biopsies of hilar and mediastinal lymph nodes (MLN), for tissue collection to mediastinal staging in NSCLC.[2,3] The assessment of clinically significant genomic alterations in surgically resected primary tumors (PT) and MLN aspirates obtained by EBUS-TBNA can provide valuable insights into the risk of recurrence, presence of occult metastases, and the identification of patients eligible for personalized therapies.[4]

Objectives: To analyze somatic variants of clinical relevance in genomic DNA (gDNA) extracted from formalin-fixed, paraffin-embedded (FFEP) PT tissues and MLN aspirates using next-generation sequencing (NGS), correlating the findings with patient overall survival.

Methods: The gDNA was extracted from paired samples (PT and MLN) from 32 patients with lung adenocarcinoma, resulting in 64 samples, and analyzed using a customized genetic panel consisting of 107 genes, utilized SureSelect XTHS2 kit (Agilent Technologies, Santa Clara, CA, USA). The overall

survive were assessed using Kaplan-Meier curves (IBM SPSS Statistics 25.0; Chicago, Illinois, EUA).

Results: Strong and potential clinical significance variants were detected in 72% of PT and 75% of MLN samples. These variants were identified in 14 different genes, highlighting *EGFR, TP53, KRAS*, and *ATM*, with a frequency of more than 15% and 10% in PT and MLN samples, respectively. Concerning survival analysis, no significant difference was observed in PT samples. Surprisingly, in MLN samples, significant differences were noted in the *TP53* and *ATM* genes (p-values of 0.001 and 0.035, respectively). This suggests that the identified variants may correlate with worse prognosis, recurrence or occult metastasis in the patients evaluated.

Conclusion: In summary, we identified distinct somatic variants between PT and MLN samples, with survival being negatively impacted by the presence of variants in MLN. Thus, the incorporation of genomic testing applied to MLN samples could enhance the accuracy of TNM staging, providing a more comprehensive approach to patient management.

Keywords: Cancer genomic; Mediastinal lymph node; Adenocarcinoma; EBUS-TBNA; NGS

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Presentation Abstracts

002

Implementation of Subxiphoid Approach for Robotic-Assisted Thymectomy: Initial Experience

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Introduction: Robotic-assisted thoracic surgery (RATS) is well-established for the treatment of mediastinal tumors. Oncological results are comparable to invasive techniques, albeit providing fewer complications and less postoperative pain.[1,2] We present our initial experience with the subxiphoid technique.

Methods: This retrospective case series includes patients submitted to RATS subxiphoid thymectomy. Demographic, perioperative, and postoperative data were gathered, analyzed, and reported with descriptive statistics.

Results: Case 1: A 48-year-old woman, ex-smoker, with a history of colon cancer and prior right thoracic surgery for metastasectomy, presented with a growing anterior mediastinal mass. Chest computed tomography (CT) revealed an oval tumor (6.8x5.0cm) located in the thymic region. Positron emission tomography (PET) showed an intake of 4.5. After surgery, the chest drain was removed on the second day and she was released later that day. Pathology unexpectedly revealed a bronchogenic cyst. **Case 2:** A 69-year-old female with hypothyroidism, hypertension, and fibromyalgia presented with a persistent dry cough. Initial diagnosis and treatment of pneumonia yielded no improvement. Chest imaging showed an oval formation in the anterosuperior mediastinum. PET scan had no uptake of the mediastinal lesion (2.8x1.8cm) and multiple enlarged lymph nodes with an SUV of 10.8. Biopsy confirmed follicular non-Hodgkin lymphoma, managed conservatively. MRI suggested a cystic lesion, possibly thymic in origin. Postop chest drain was removed on the first day and she was discharged on the third day. Pathology corroborated a thymic cyst. **Case 3:** Female, 67 years old, ex-smoker, hypertensive, and undergoing chronic dialytic renal treatment, was referred due to an asymptomatic anterior mediastinal lesion (1.6x0.9cm) on chest CT. MRI suggested a solid lesion of likely thymic origin. Postop recovery was planned in the ICU to accommodate scheduled dialysis, necessitating a 5-day stay. The pleural drain was removed on the 3rd day, and

she was discharged on the 6th day. Pathology confirmed a thymoma. **Case 4:** A 61-year-old female, ex-smoker, hypertensive, with a history of breast reduction surgery and recently diagnosed urothelial carcinoma. Chest CT revealed a nodular lesion (3.5x1.9cm) below the left thyroid lobe. Transthoracic biopsy indicated a thymoma. PET-CT had no uptake. Following treatment for the kidney neoplasm, thymectomy was performed. The pleural drain was removed on the first postop and the patient was discharged the same day.

Technique: In supine position under general anesthesia and selective left bronchial intubation, a 3cm vertical subxiphoid incision is made. Two 8mm ports are inserted through the 6th intercostal space (ICS) in the left and right midclavicular lines. A cranial position docking was used and the camera scope remained on the subxiphoid port. This access provided visualization of the phrenic nerves and mammary arteries bilaterally, and a good exposition of the left brachiocephalic vein in all cases facilitating an aggressive and safe resection of the thymus and pericardial adipose tissue. The specimen is removed in a bag through the subxiphoid incision and a 28Fr drain is placed through the midline to the right pleura.

Experience: The first three cases had arms alongside the body. For the fourth case, we preferred open arms so the 8mm ports could be placed bilaterally at the anterior axillary line to avoid collisions with the mammary vessels. The auxiliary port was made on the midclavicular line on the right side, with better ergonomy (Figure 1). For the first case, the DaVinci Xi platform was used and a GelPOINT mini device was employed for the initial dissection with ligasure maryland. For the other 3 procedures, the Si platform was utilized and the GelPOINT wasn't available, so the CO2 leak was compensated by using 2 insufflators. All procedures were uneventful, with a median time of 180 minutes.

Conclusion: Our initial experience demonstrates promising outcomes, emphasizing the potential for this technique to enhance the visualization of mediastinal structures and reduce surgical morbidity. Standardizing and refining this approach will contribute to its broader adoption and further improvement in patient outcomes.

Keywords: Robot-assisted surgery; Thoracic surgery; Thymectomy

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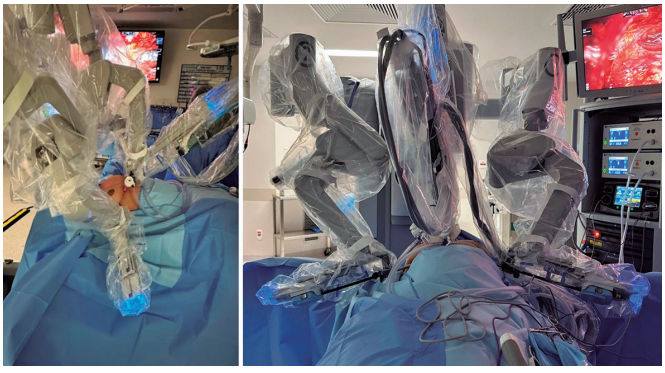

Figure 1. DaVinci Si docking for subxiphoid thymectomy

003

Association of Robotic Pleurectomy and Cytoreduction with Hyperthermic Intrathoracic Chemotherapy (HITHOC) for pleural recurrence of Type AB Thymoma

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Introduction: Although usually of an indolent nature, thymoma recurrence rates vary between 15% and 50%.[1] While surgery remains the cornerstone of treatment, advanced or recurrent thymomas present significant challenges due to their invasive nature and propensity for local recurrence. Hyperthermic intrathoracic chemotherapy (HITHOC) has emerged as a promising adjunctive therapy to address these challenges.[2,3] This case report presents the utility and outcomes of HITHOC associated with robotic-assisted thoracic surgery (RATS) in the management of a recurrent thymoma.

Methods: This retrospective case had demographic, perioperative, and postoperative data gathered, analyzed, and reported with descriptive statistics.

Results: We present a case of a 41-year-old female, with a history of Type AB Thymoma, resected in 2021 measuring 9.4 cm. At the time, histopathological analysis revealed an intact capsule, without microscopic invasion, clear margins, and no angiolymphatic invasion. However, in 2024, during a routine follow-up, a new PET scan revealed an elongated nodular formation in the subaortic region (2.2x1.0cm), with an uptake of 4.5, suggesting recurrence. Additionally, another smaller nodular formation was identified, inferior to the described lesion, measuring 0.5cm, without significant uptake. In light of these findings, after multidisciplinary discussion, cytoreduction and adjuvant intrapleural hyperthermic chemotherapy were opted for. Utilizing the da Vinci XI robotic platform, complete parietal pleurectomy and resection of the lesions on the left visceral pleura, pericardium, and subaortic lymph node were performed. Subsequently, the tubes for infusion and drainage of the HITHOC were placed and after closing the thoracic cavity, hyperthermic chemotherapy with cisplatin and doxorubicin was conducted for 60 minutes, maintaining the temperature around 42°C with continuous monitoring. After completion, the pleural cavity was opened, hemostasis was revised, and two 28 Fr drains were placed. In the postoperative period, the patient was successfully extubated, remaining in the ICU for one day for intensive monitoring. Her recovery proceeded without complications, and after seven days the drains were removed. On the seventh day, the patient was discharged from the hospital. The patient continues to be regularly monitored, and so far has shown no signs of recurrence.

Conclusion: This case report highlights the challenges faced in managing recurrent. Thymoma and underscores

the efficacy of minimally invasive surgical approach with Robotic Surgery combined with HITHOC in an attempt to control the disease and improve patient survival.

Keywords: Pleural cavity; Chemotherapy; Cytoreduction surgical procedures; Thymoma

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The authors declare that the patients in this study consented to their data use with a signed consent form.

004

Indocyanine green and the delimitation of the intersegmental plane in sublobar resections

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Introduction: Colorectal cancer (CRC) is the leading cause of cancer death worldwide.(1) It is estimated that about 50% of patients with CRC develop metastasis during follow-up, most commonly in the liver followed by the lung. Lung metastasis is seen in approximately 10 - 15% of patients diagnosed with CRC.(1,2) Pulmonary metastasectomy is the treatment with the best survival rate.(3) Due to the high incidence of lung recurrence, in approximately 50% of cases, parenchyma-sparing lung resections were required.(1) Video-assisted thoracoscopy is the access route of choice for lung resections. However, the delimitation of the vascular, tracheobronchial, and intersegmental plane anatomy is a critical point in sublobar resections. As a result, there was a need to implement new technologies in the preoperative period, such as 3D reconstruction, and in the intraoperative period, such as the use of indocyanine green for better characterization of the intersegmental plane.(4,5) With the advent of indocyanine green, complex sublobar resections became feasible, with precise delimitation of the intersegmental plane, thus ensuring adequate oncological margins and a lower rate of vascular lesions.(4,5) **Objective:** Therefore, the present report aims to demonstrate the benefit of the use of indocyanine green in sublobar resections of RCC lung metastases.

Case report: A 55-year-old female patient diagnosed with Colorectal Adenocarcinoma in 2021 underwent surgical treatment and adjuvant therapy to control the primary disease. In a follow-up imaging exam, a lesion was identified in the left lower lobe, and she was then submitted to SBRT in June 2022, with local control of the disease. During follow-up with imaging tests, two new lesions were identified: one in the left lower lobe and the other in the lateral segment of the lingula, thus pulmonary metastasectomy treatment was proposed. In the preoperative period, three-dimensional reconstruction was performed using a computed tomography scan of the chest. The patient underwent video-assisted thoracoscopy with wedge resection of the lesion in the lower lobe, and anatomical resection of the left segment of lingula was performed. It started by releasing the inferior pulmonary ligament, followed by opening the pulmonary fissure, with identification of the interlobar artery, as well as identification of lingular branches (A4 + A5). Dissection of the hilar lymph node chain was performed with identification of the lingular bronchus. After that, the mediastinal pleura was opened, with identification of the lingular veins (V4 + V5) and the vein of the anterior segment of the left upper lobe - V3. Next, indocyanine green (0.05 mg/kg) was administered to delimit the intersegmental plane, with subsequent stapling of the lung parenchyma. The patient was extubated while still in the operating

room and referred for anesthetic recovery. The chest tube was removed on the 1st postoperative day with a serous flow rate of 100ml, without air leakage, and the patient was discharged from the hospital on the second postoperative day without the need for the use of opioids.

Commentary: With the development of minimally invasive surgical techniques, it is necessary to develop technologies that assist in the planning and during the surgical procedure, thus reducing complication rates, surgical time and the need for conversion to exploratory thoracotomy. After administration of indocyanine green, the delimitation of the intersegmental plane is greater than 94%.[4] The use is safe for the patient, with positive intraoperative outcomes. Thus, the need for implementation and diffusion of technologies in the routine of specialized services is concluded.

Keywords: Indocyanine green; Intersegmental plane; Sublobar resection; lung metastasis

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005

Robotic precision in lung cancer complex surgery: a video-guide on right segmentectomy using indocyanine green

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Introduction: Recent two randomized studies have demonstrated that for lung cancers peripherally and smaller <2cm, segmentectomy accompanied by intraoperative lymph node assessment is as effective as lobectomy in terms of overall survival.(1) The video presents a comprehensive guide to performing a right robotic segmentectomy, specifically of segments 9 of the lung.(2) This includes a thorough hilar and mediastinal nodal dissection. Additionally, the video showcases the application of Indocyanine Green (ICG) to accurately identify the intersegmental plane, aiding in precise resection margin determination after segmental pulmonary artery and vein division.(3,4)

Case report: A 61-year-old female patient, active smoker (10 cigarettes/day), with no previous comorbidities, was referred for evaluation by the Thoracic Surgery team due to the growth of pulmonary nodules over a 3-year period. The patient was asymptomatic. Initially, PET-CT was requested with findings of two pulmonary nodules located in the apicoposterior segment of the left upper lobe and in the lateral basal segment of the right lower lobe. Both nodules grew approximately 1.0cm over a three-year period. Thereat the sublobar resection procedure of the nodule in the lateral basal segment of the LSD was initially indicated. Therefore, preoperative exams were requested with results within normal limits and the patient was referred for the procedure. Within the surgical planning, anatomical three-dimensional reconstruction of the case was carried out. During the surgery, the patient was positioned in the left lateral decubitus position and selective intubation was performed. It began with a right videothoracoscopy to block the intercostal nerves. After this procedure, the Xi robot was docked. It began with the resection of lymph node samples from chairs 9, 10, 2+4R, 12, 11R and 13. Then we moved on to the treatment of the hilar structures: gray fillers were used for the vascular structures and purple filler for the bronchial structure. We proceeded with indocyanine green to delimit the lung parenchyma and separate it using black and purple fillers. Finally, segments 6 and 8 were sutured to the middle lobe and pleural drainage of the thoracic cavity was performed. The patient was extubated after the procedure and taken to an infirmary bed. The chest tube was removed on the first day after surgery and the patient was discharged from hospital on the second day.

Commentary: For neoplastic lung lesions, surgical planning with detailed imaging exams as well as the use of 3D reconstruction of the lesion allows for greater knowledge of the thoracic anatomy. Finally, these new tools provide the possibility of complex lung resections associated with a broad sampling of thoracic lymph nodes in an increasingly safer manner.(2)

Keywords: Robotic surgery; 3D reconstruction; Segmentectomy; Indocyanine green

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Presentation Abstracts

006

Cytological and histological scraping slides for DNA extraction in next-generation sequencing: refining molecular diagnosis of non-small cell lung cancer

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Introduction: Genomic mutational profiling, obtained through next-generation sequencing (NGS) plays a pivotal role in assisting clinicians in therapeutic decision-making in patients with non-small cell cancer (NSCLC).[1,2] However, these techniques require high quality and sufficient quantity of material to produce reliable results.[3,4] Our study proposes the use of tissue scraping from histological and cytological slides as an alternative method for obtaining genomic DNA (gDNA) of better quality and quantity, and also an optimized extraction protocol from paraffin samples of NSCLC.

Methods: Forty-three samples were analyzed, collected between 2011 to 2019, comprising aspirates from mediastinal lymph nodes (MLN) obtained by endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) and surgically resected and biopsies specimens of primary tumors (PT). To comparative study we also precisely followed the manufacturer's GeneRead® DNA FFPE Kit (Qiagen GmbH, Hilden, Germany) protocol as "gold standard", and an adapted protocol from Qiagen kit was used from FFPE and scraped slides samples.

Results: The findings demonstrated significantly higher yields of gDNA extracted from scraped slides compared to the same material obtained from FFPE blocks ($p<0.001$). Even when comparing different extraction methods for MLN and PT samples, the yield from slide-scraping samples remained notably higher than those obtained from blocks sections ($p=0.003$ and $p<0.001$, respectively).

Conclusion: Our findings indicate that material extracted from histological and cytological scraped slides presents an excellent alternative for obtaining gDNA for genomic studies. This approach yields higher quantities of gDNA compared to genetic material obtained directly from FFPE blocks, maintaining sufficient quantity and quality for NGS applications. The results are promising in the field of genomic research, especially when working with tissue samples fixed and stored for long periods.

Keywords: gDNA extractione; Scraped slides; FFPE material; Mediastinal lymph node; EBUS-TBNA

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007

Underutilization of adjuvant therapy in resected IB-III non-small-cell lung cancer risk model - analysis from the Brazilian registry of lung cancer

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Introduction: Despite the proven survival benefits of adjuvant systemic therapy (AT) in resected non-small-cell lung cancer (NSCLC), its underutilization remains a concern.[1-3]

Objecitve: This study aims to explore the extent to which socioeconomic disparities influence AT underutilization.

Methods: Data from the Brazilian Registry of Lung Cancer (2009-2023), was queried for patients with complete surgical resected stage IB-III and stratified based on AT delivery. Demographic, clinical, and pathological variables were evaluated. Logistic regression model was performed. The model's performance was assessed through detailed analyses of sensitivity, specificity, and the Area under the Receiver Operating Characteristic (AUC-ROC) curve, complemented by the Hosmer–Lemeshow test for evaluating its fit and accuracy.

Results: Among 427 patients with resected stage IB–III NSCLC eligible for AT, only 38.4% received it. Higher AT delivery rates were observed in stages III/II compared to IB ($p<0.001$). Factors such as age, insurance, histology, lymphovascular invasion, TNM pathological stage, and pathological node (pN) status were independently associated with AT delivery in univariable analysis ($p<0.005$). Multivariable logistic regression model revealed that older age, public healthcare system, specific histological types, pneumonectomy, and stage IB were significantly associated with non-receipt of AT ($p<0.05$), see table 1. The final Multiple Binary Logistic Regression model presents an equation to estimate the likelihood of a patient undergoing solely surgical treatment. This equation is formulated as $-5.703 + 0.058\times\text{Age} + 0.974\times\text{PublicHealthSystem} + 0.241\times\text{CEC} + 3.059\times\text{LargeCells+Others} + 0.868\times\text{Pneumonectomy} + 0.657\times\text{Sublobar} + 2.089\times\text{StageIB} + 0.867\times\text{StageIIA} + 0.386\times\text{StageIIB} - 0.251\times\text{StageIIIA} + 1.207\times\text{pNNegative}$. A calculated probability above 42.5% categorizes a patient for exclusive surgical intervention. The model demonstrates robust discriminative ability, evidenced by an AUC of 0.833 (Figure 1), high sensitivity at 90.2%, and moderate

specificity of 60.0%. The model's fit was confirmed through the Hosmer-Lemeshow test, with a p≥0.05.

Conclusion: Underutilization of AT in patients with resected stage IB-III NSCLC is linked to patient, institutional, and pathological factors. Addressing these disparities is crucial, particularly with the advent of new adjuvant therapy options that promise enhanced survival outcomes.

Keywords: Adjuvant therapy; Socioeconomic disparities; Immunotherapy; Non-small-cell lung cancer; Systemic therapy

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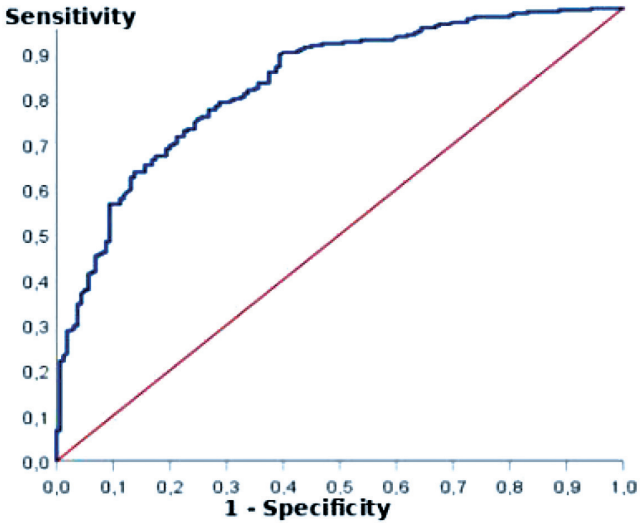
Table 1. Multiple Binary Logistic Regression Analysis to Identify Risk Factors Associated with adjuvant therapy not delivery

		- Final model -			
Risk Factors	**β**	**Wald Chi-Squared test**			**O.R (C.I 95%)**
Intercept (β0)	-5,703	24,689	< 0,001	-	-
Age at surgery	**0,058**	**16,669**	**< 0,001**	**1,06**	**(1,03; 1,09)**
Health care system					
Public	0,974	7,58	**0,006**	**2,65**	**(1,32; 5,30)**
Private	0				
Type of histology					
Adenocarcinoma	0				
Squamous	0,241	0,73	0,393	1,27	(0,73; 2,21)
Large cells and others	3,059	16,486	**< 0,001**	**21,3**	**(4,9; 93,3)**
Type of ressection					
Lobectomy	0				
Pneumonectomy	0,868	3,652	0,056	2,38	(0,98; 5,80)
Sublobar	0,657	0,361	0,548	1,93	(0,23; 16,47)
Pathological stage (TNM 8th)					
I-B	2,089	9,768	**0,002**	**8,1**	**(2,2; 29,9)**
II-A	0,867	1,597	0,206	2,38	(0,62; 9,13)
II-B	0,386	0,51	0,475	1,47	(0,51; 4,25)
III-A	-0,251	0,222	0,637	0,78	(0,27; 2,21)
III-B	0				
Pathological node status (pN)					
positive	0				
negative	1,207	15,766	**< 0,001**	3,34	**(1,84; 6,07)**

Note: Pseudo R2 (Cox & Snell) = 0,300 // Pseudo R2 (Nagelkerke) = 0,408
The p-value refers to the probability of significance for the Wald Chi-Squared test.
Hosmer-Lemeshow Test p = 0.234
ß = Regression Coefficient
95% Confidence Interval for the Odds Ratio = 95% C.I for O.R.



NOTE: - AUC (Area Under the Curve) = 0.83 and 95% CI AUC = (0.79; 0.87).

Figure 1. AUC-ROC Curve to detect the cutoff point based on the probability of a patient receiving "Surgical Only" treatment estimated by the Multiple Binary Logistic Regression Model

Presentation Abstracts

008

Hyperthermic Intrathoracic Chemotherapy (HITHOC) following decortication for pleural disseminated neoplastic disease: initial experience

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Introduction: Hyperthermic intrathoracic chemotherapy has been used as an adjuvant treatment after surgical resection of patients diagnosed with disseminated pleural neoplastic disease. The most frequent uses refer to malignant pleural mesothelioma and thymic tumors.[1,2]

Objective: This study aims to describe our initial experience implementing this method of hyperthermic chemotherapy used after cytoreductive surgery.

Methods: This is a retrospective study with a series of cases of patients who underwent pleural decortication followed by HITOC. We collected demographic and pre-operative clinical information and intra-operative and post-operative data. The variables were analyzed and reported with descriptive statistics.

Results: The standard procedure first involved surgical cytoreduction with complete pleural decortication of both visceral and parietal sheets. When macroscopic signs of invasion were identified, the diaphragm and pericardium were resected. Then, we placed the perfusion system with two infusion tubes in the pleura, and the chest was closed. A solution of cisplatin at 100mg/m^2 and doxorubicin at 50mg is injected at 42°C for 60 minutes, controlled by the infusion machine. Later, the chest was reopened for revision, and standard chest tubes replaced the infusion tubes. Five patients underwent decortication and HITOC in the study period. The median age at the surgery was 54 years. Most cases were female, and the most common diagnosis was malignant pleural mesothelioma. All the patients had induction chemotherapy, and two also had immunotherapy before surgery. There were no significant complications in this series. However, two patients had prolonged air leaks and had to be discharged with a chest tube. Another patient had mild renal dysfunction, and one other had a self-limited cardiac arrhythmia. The median time of chest drainage was eight days, and the median length of hospital stay was ten days.

Conclusion: Hyperthermic intrathoracic chemotherapy is a viable and safe adjuvant treatment for disseminated pleural disease after surgical cytoreduction.

Keywords: Hyperthermic intrathoracic chemotherapy; Malignant pleural mesothelioma; HITHOC; Thymic carcinoma

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009

Videothoracoscopy and sternotomy approach for adenoid cystic carcinoma: case video

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Introduction: Primary tracheal tumors have a prevalence around 0.2% of the entire respiratory system.(1) Two-thirds of tracheal tumors are malignant, of which 75% are squamous cell carcinoma and 15% are adenoid cystic carcinoma. Due to the low incidence, we chose to report the case of a patient with adenoid cystic carcinoma approached via videothoracoscopy and sternotomy with incomplete resection of the lesion (R1) with clinical and radiological control of the disease following adjuvant therapy.(2)

Case video Summary: A 51-year-old male patient, non-smoker, with clinical signs of progressive dyspnea, weight loss (15kg) and hoarseness for 6 months. The patient underwent neck tomography and bronchoscopy with the finding of a 4.0cm-long vegeto-infiltrative lesion located 3.0cm from the vocal folds and 5.5cm from the carina. After 2 months, laryngoscopy and biopsy of the lesion were performed with histopathological results of Adenoid Cystic Carcinoma. The clinical case was discussed among the Thoracic Surgery team and surgery was chosen. At the time of surgery, the patient underwent selective intubation and was positioned in the left lateral decubitus position. Initially, a videothoracoscopy on the right was performed to release the pulmonary hilum to facilitate mobilization of the trachea. Afterwards, the patient was positioned in the supine position and underwent resection and cricotracheal anastomosis via sternotomy. Frozen margins during the surgical procedure demonstrated involvement of the lateral and proximal posterior margin. After the procedure was completed, extubation was carried out and he was taken to the intensive care unit. The patient presented a favorable evolution during the postoperative period with early return to oral feeding (second day) and discharge from the ICU on the third postoperative day. After 7 days of hospitalization, the patient showed complete acceptance of the oral diet, preserved speech, and was discharged from the hospital. The anatomopathological result was compatible with adenoid cystic carcinoma with compromised margins. The patient is currently undergoing radiotherapy with adequate disease control.

Conclusion: With this report, we describe a diagnostic and therapeutic strategy for cases of adenoid cystic carcinoma with incomplete resection of the lesion. Finally, for large and distal tracheal lesions, the technique of releasing the pulmonary hilum via a minimally invasive route allows for better mobilization of the trachea, facilitating the resection of the affected area and the construction of the tension-free anastomosis, as demonstrated in this report.

Keywords: Tracheal neoplasms; Adenoid cystic carcinoma

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010

Comprehensive analysis: efficacy of pembrolizumab as an initial therapy for PD-L1 negative NSCLC

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Introduction: Bronchogenic tumors, predominantly non-small cell type (NSCLC), are a global health concern, with adenocarcinomas, their most common subtype, being most often diagnosed at advanced stages, making it essential to develop effective therapeutic strategies, especially for patients with NSCLC who do not express the PD-L1 (Programmed Death-Ligand 1) protein. Two pivotal studies, Keynote-189[(1)] and Keynote-407,[(2)] presented their combined results in 2023, after a 5-year follow-up,[(3)] concluding that the combination of Pembrolizumab and chemotherapy demonstrated substantial improvements in overall survival (OS) compared to chemotherapy alone. These results represent a significant advancement in the therapies for PD-L1-negative NSCLC, offering a new therapeutic perspective for this group of patients without compromising treatment tolerability. This article analyzes and synthesizes the data from these studies, highlighting its importance and clinical potential of this combined approach in the management of NSCLC.

Objective: To evaluate the potential of oncologic therapy with Pembrolizumab in patients with PD-L1-negative NSCLC.

Methods: This is a descriptive study through the critical analysis of works that correlated the different perspectives of oncologic therapies for lung cancer, relating to PD-L1-negative NSCLC, written in the English language.

Results: The two fundamental studies, KEYNOTE-189 and KEYNOTE-407 divulged in 2023 their combined results for PD-L1 negative patients. In the Gadgeel et al. study, of 442 patients with a mean follow-up of 60.7 months, the 255 patients who received pembrolizumab plus chemotherapy achieved a survival rate of 12.5%, compared to 9.3% among 187 patients undergoing chemotherapy alone. Keynote-189 results were similar, being observed in the study, which included 616 patients with non-squamous NSCLC, over 5 years of follow-up, utilizing pembrolizumab plus chemotherapy, resulting in a median OS increase of 11% compared to the Control Group. Additionally, the Keynote-407 study, which included 559 patients with a mean follow-up time of 56.9 months for pembrolizumab plus pemetrexed- platinum, indicated a marked improvement in progression- free

survival (PFS), with rates of 10.8% *versus* 3.5% for the placebo, and survival rates for the first group was also longer, with a 18.4% rate compared to the placebo group 9.7% (Table 1).

Conclusion: According to the analysis of the presented results, it is evident that Pembrolizumab represents a promising and effective therapy for patients with PD-L1 negative NSCLC. The Keynote-189 and Keynote-407 studies consistently highlighted improvements in overall survivorship and progression-free survival with the use of Pembrolizumab plus chemotherapy, as opposed to chemotherapy alone. These outcomes offer a new therapeutic perspective for a group of patients who previously had limited treatment options, representing a significant advancement in the management of these patients, with real potential to positively impact clinical practice and improve outcomes for patients with PD-L1 negative NSCLC.

Keywords: Drug therapy; Lung neoplasms; Non-small-cell-lung; Immunotherapy; PD-L1 protein

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Table 1. Results of the included studies

Author and year	Population	Pembrolizumab plus chemotherapy	Placebo plus chemotherapy	5-years OS	5-years PFS
Garassino et al.[1] 2023	616	410	206	19.4% *versus* 11.3%	7.5% *versus* 0.6%
Novello et al.[2] 2023	559	278	281	18.4% *versus* 9.7%	10.8% *versus* 3.5%
Gadgeel et al.[3] 2023	442	255	187	12.5% *versus* 9.3%	

Pembrolizumab plus chemotherapy has proven to be more effective than using placebo plus chemotherapy in all three studies when comparing 5-years overall survival (OS) and 5- years progression-free survival (PFS).

Presentation Abstracts

011

Development of a Nomogram for Predicting Survival in Early-Stage Non-Small Cell Lung Cancer: Insights from the Brazilian Lung Cancer Registry

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Introduction: The prognostic evaluation of early-stage non-small cell lung cancer (NSCLC) remains critical for optimizing treatment strategies and improving patient outcomes.[1-3]

Objective: This study aims to delineate the pivotal predictors affecting survival rates among early-stage NSCLC patients, leveraging data from the Brazilian Lung Cancer Registry.

Methods: This study retrospectively analyzed data from the Brazilian Lung Cancer Registry, encompassing 2,045 patients who underwent surgical treatment for lung cancer across 14 institutions in five Brazilian states. The registry is prospectively maintained, ensuring comprehensive and up-to-date data capture. Inclusion criteria focused on patients with stage I and II NSCLC with completed pivot variables, narrowing the cohort to 736 eligible subjects. Kaplan-Meier survival analysis, along with univariate and multivariate Cox regression models, were employed to assess the impact of various demographic and clinical variables on survival. These variables included age, gender, tumor type, grade, stage, tumor size, nodal status, and received treatments.

Results: Survival analysis revealed significant differences across demographic and tumor-related variables. Patients younger than 50 years displayed notably superior survival rates compared to those over 70 ($p<0.0001$). The type of tumor also significantly influenced outcomes, with adenocarcinoma showing better survival than squamous cell carcinoma ($p<0.0001$). Large tumors (≥30mm) were associated with a higher mortality risk compared to smaller tumors (≤9 mm) ($p<0.0001$) (Figure 1). Multivariate analysis identified age, tumor type, grade, stage, nodal involvement, and tumor size as independent prognostic factors. The developed nomogram (Table 1), based on these findings, achieved a C-index of 0.76, demonstrating good predictive accuracy for 1, 3, and 5-year survival, supported by AUC values of 0.79, 0.79, and 0.76, respectively.

Conclusion: This analysis underscores the significance of specific prognostic factors in determining the survival of patients with early-stage NSCLC in the Brazilian context. The derived nomogram offers a valuable tool for clinicians to predict survival outcomes, facilitating personalized treatment planning. The study highlights the utility of national cancer registries in enhancing our understanding of cancer prognosis and treatment effectiveness.

Keywords: Normogram; Survival early-stage non-small cell lung cancer; Non-small cell lung cancer

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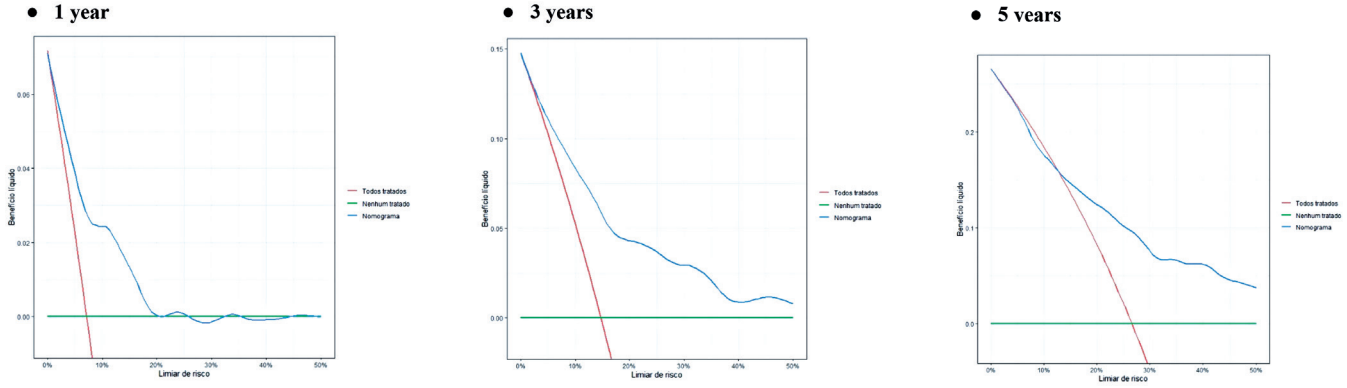
SGPP number: Not applicable.

CAAE: Not applicable.

Research funding: Not applicable.

DECISION CURVE (DCA) FOR EVALUATING THE NOMOGRAM

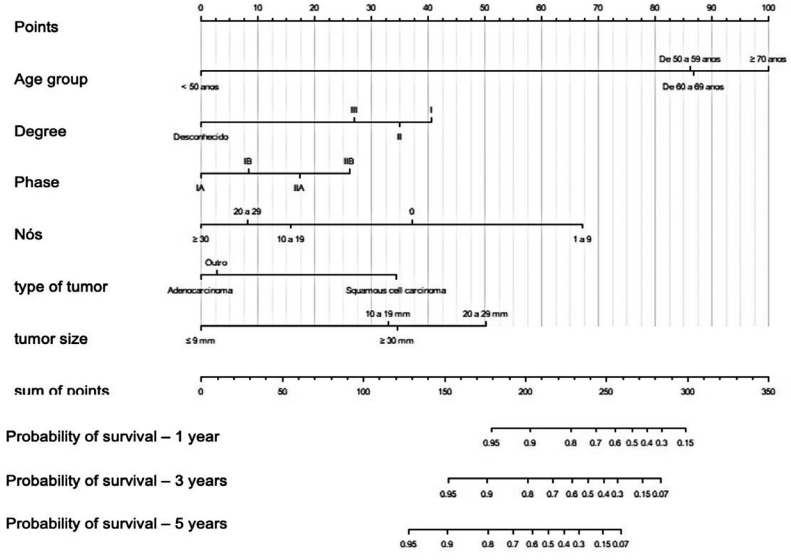


DATABASE: 736 patients overall.

Figure 1. Decision Curve Analysis (DCA) for 1-, 3-, and 5-year Overall Survival in the Study Cohort

FINAL COX MODEL NOMOGRAM

Table 1. Prognosis using the Nomogram for 1, 3 and 5 years



DATABASE: 736 patients overall.

012

Tracheal glomus tumor resection with cervicotomy and right thoracotomy: case video

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Introduction: Glomus tumors (GTs) are rare mesenchymal tumors typically developing at the anastomosis of arteries and veins, and generally characterized as benign.(1) They represent less than 2% of all soft tissue tumors, commonly affect nail beds, extremities, the torso, head and neck. Their occurrence in the trachea is unusual, with around 80 cases reported in literature, commonly occurring in middle-aged individuals, with an average age of 48.8 years, and more prevalent in men than women.(1,2)

Patients with TGTs often present with dyspnea (52%), cough (51%) and hemoptysis (45%), associated with airway irritation. The statistics locations of TGTs indicate that the lower-third of the trachea is a common location (35,06%) and the main differential diagnoses are carcinoid tumor and hemangiopericytoma, however the diagnosis depends on the pathological examination and immunohistochemical staining patterns.(3)

For the treatment, the literature indicates sleeve resection with primary reconstruction of the trachea as treatment of choice. Endobronchial therapy also can be used and includes laser resection and high frequency electrocoagulation. Rate of metastasis is 31-38%, and tumors often recur between 3 and 4 years after surgery. To date, the reports of adjuvant chemotherapy have been rare and the effectiveness still unclear.(3)

Objective: In this video, we present a case of tracheal glomus tumor (TGT), as well as the resection technique used in our department.

Case video Summary: A 67-year-old man, with a 30 pack-year history of cigarette smoking was admitted for a one-year history of cough, dyspnea and hemoptysis. Bronchoscopy identified a solid tumor, originating from the right lateral wall of the lower trachea with 80% obstruction and a rich blood supply. Chest computed tomography (CT) confirmed a 2.6 x 2.4 x 2.2 cm vegetative lesion located 6.2 cm below the vocal cords and 2.5cm above the carina. Patient underwent resection and tracheoplasty under general anesthesia and selective left intubation guided with bronchoscopy. Procedure began in the supine position with cervicotomy including previous tracheostomy site, release of adhesions and dissection of the anterior fascia. After the closure of incision, proceeded to left lateral decubitus with right posterior thoracotomy in the third intercostal space, added a 10mm auxiliary incision in the tenth right intercostal space (RIS) for the 10mm/30° thoracoscope and an incision at the seventh RIS. In the dissection, we opened the mediastinal pleura, dissected the anterior, lateral and posterior of trachea and proceeded the regional lymphadenectomy. After that, the pericardium was opened near the pulmonary hilum and furthermore released the inferior pulmonary ligament to improve mobilization.

Once we opened the inferior trachea beyond the tumor, it was possible to intubate in the surgical field and proceed the above resection of the trachea and the 3.5cm tumor. The pathology in the operative room demonstrated tumor-free margins. Initiated the end-to-end anastomosis of the trachea with 4-0 polydioxanone continuous suture in the posterior wall, returned the ventilation through orotracheal intubation and proceeded the interrupted sutures at the lateral and anterior tracheal walls. No air-leak was identified after closure and procedure was finished with right pleural drainage with a 28Fr tubular and chest wall closure with Vicryl and Monocryl. Patient underwent postoperative care in the intensive care unit (ICU) maintaining spontaneous ventilation and was discharged to the ward after 3 days and home after 7 days.

Postoperative pathology revealed lobulated neoplasm involving the tracheal wall and permeating vessels, measuring 2.5 x 2.4 x 2.2cm, 7 mitoses in 10 fields and presenting perineural invasion. Proximal, distal and radial surgical margins were free of neoplasm. Immunohistochemical examination reported positive focal CD56, positive Ki-67 (30%), AML and Caldesmon. These findings were consistent with the diagnosis of Tracheal Glomus Tumor. The patient recovered well and is continually being monitored with medical appointments and neck and chest CTs.

Conclusion: In this article, we present a detailed case of a tracheal glomus tumor, highlighting the clinical presentation, diagnostic process, and the resection technique employed in our department. Our approach underscores the importance of accurate diagnosis and effective surgical intervention with radical resection in managing this rare condition.

Keywords: Glomus tumor; Trachea

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013

Postoperative drainage time for air leaks after lung resection for non-small cell lung cancer (NSCLC): a retrospective cohort analysis

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Introduction: With the advance of minimally invasive thoracic surgical techniques, postoperative hospitalization is shorter, and recovery is faster. However, chest drainage may be a limiting factor for hospital discharge, extending the hospital stay. Therefore, it is vital to understand the elements that could affect it so we can develop ways to prevent it. **Objective:** This study aims to assess the parameters that influence chest drainage for air leaks following anatomical lung resection for lung cancer.

Methods: We queried our institutional database of lung cancer resection for all patients between June 2009 to December 2022 who underwent lobectomy or anatomical segmentectomy. The primary outcome was chest tube drainage time due to an air leak. We excluded patients who underwent wedge resection and pneumonectomy and those who developed chylothorax or postoperative bleeding. Univariable comparisons were performed with χ^2, Mann-Whitney, and Kruskal-Wallis tests, and multivariable with logistic regression modeling.

Results: We analyzed 743 patients, 56.5% women, with a median age of 66.2 years. Most patients (83.7%) had the treatment in the public healthcare system. 72.8% had a positive smoking history. The median overall chest drainage time was 3 days (interquartile range IQR 2-4). Baseline characteristics associated with lower chest drainage time were female and younger patients, private healthcare, negative smoking history, absence of emphysema, and lower body mass index.

Open surgery had a higher median drainage time vs. video-assisted thoracic surgery (VATS) and robotic-assisted thoracic surgery (RATS) ($p<0.001$). VATS and RATS had the same median time, but the robotic approach had a smaller IQR (Figure 1). Lobectomy had a median drainage time of 3 days (IQR 2-5) *versus* segmentectomy 2 days (IQR 1-3) ($p<0.001$). The right upper lobectomy had a higher drainage time than every other lobectomy ($p<0.001$). On multivariable analysis, the following features were statistically significant for lower drainage time: emphysema, lobectomy, surgical approach, and postoperative in the intensive care unit.

Conclusion: The chest drainage time after anatomical resection was longer in patients with pulmonary emphysema, lobectomy, open approach, and postoperative admission in the intensive care unit. Although VATS and RATS had the same median

drainage time, in general the robotic approach had the tendency for a shorter period of chest drainage.

Keywords: Lung lobectomy; Ais leaks; Postoperative complication

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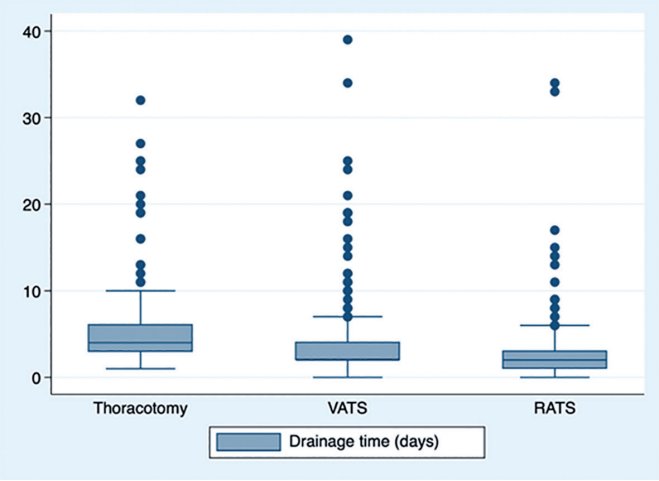

Figure 1. Box plot graph comparing the drainage time on open surgery, VATS, and RATS

014

Preoperative predictive criteria for sternotomy necessity in the surgical treatment of intrathoracic goiters

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Introduction: The intrathoracic goiter is a mediastinal condition from the thyroid. It can be primary, independent from the cervical thyroid, or secondary, a result of the gland enlargement from the neck to the thorax. The diagnosis is made through physical examinations and imaging tests, such as CT scans and scintigraphy. Total thyroidectomy is the main treatment for substernal goiters, rarely requiring sternotomy. Pre-operative factors such as time of evolution, density and tissue location can predict the need for sternotomy. The development of robotic surgery also offers a viable alternative for complex cases of intrathoracic goiters.

Objective: This study aims to evaluate the predictive preoperative criteria used in different hospitals for the need of sternotomy in the surgical treatment of intrathoracic goiters.

Methods: An integrative bibliographic review was conducted using the descriptors "intrathoracic goiter" OR "intrathoracic goitre" AND "sternotomy" OR "sternotomy criteria" on the following search engines: PubMed and BVS (*Biblioteca Virtual de Saúde*). We limited the results to articles published from 2020 to 2024 that were available in english, portuguese and spanish. Review articles, case reports and articles that didn't discuss the review subject were excluded from the final selection.

Results: Goiters older than 9 years and the substernal portion of the goiter having a mediastinal extension ≥5 cm beyond the sternal notch showed high sensitivity and specificity for predicting the need for sternotomy.[1] The thyroiditis process proved to be a significant predictor of the sternotomy need.[2] The fact that the goiter extends below the aortic arch,[2,3] more than 50% of the goiter being located in the thorax, having malignancy characteristics, being in the posterior mediastinum, being a primary substernal goiter and wider than the thoracic inlet were also considered relevant predictive factors for sternotomy.[3]

Conclusion: The results obtained do not show a consensus on which factors should be considered during surgical planning for this type of disease. The only point of agreement between the studies was the location of the goiter below the aortic arch. Thyroidectomy with an isolated cervical approach is usually adequate for the majority of cases, since the mediastinal portion can be mobilized using appropriate surgical techniques, to be removed by cervicotomy access, and in around 5% of surgical approaches, sternotomy is necessary due to the location below the aortic arch. Pre-operative planning is of the utmost importance in order to avoid intra-operative complications, exposing the patient to a longer hospital stay and greater risk factors for morbidities associated with sternotomy. It can therefore be concluded that the lack of an effective guideline means that the approach is left to the discretion of the surgical team, which can result in complications that

lead to functional impairment of the patient when not handled by experienced professionals.

Keywords: Intrathoracic goiter; Surgical procedure; Sternotomy

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SGPP number: Not applicable.

CAAE: Not applicable.

Research funding: Not applicable.

Presentation Abstracts

015

Acute lung injury post-surgical resection

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Introduction: Acute Lung Injury (ALI) and Acute Respiratory Distress Syndrome (ARDS) are critical pulmonary conditions characterized by the sudden onset (<7 days) of severe hypoxemia and bilateral lung infiltrates.[1,2] The study investigates the occurrence of Acute Lung Injury (ALI) and Acute Respiratory Distress Syndrome (ARDS) following surgical resections, focusing on clinical manifestations, risk factors, and outcomes.

Methods: A retrospective analysis of eight cases of ALI post-surgical resection between 2020 and 2023 was conducted. Data on patient demographics, comorbidities, surgical techniques, and complications were collected from medical records and diagnostic tests.

Results: Post-operative pulmonary infiltrates developed in eight patients, with a mortality rate of 50%. Risk factors included hypertension, smoking, COPD, diabetes, and dyslipidemia. 87.5% of patients were classified as ASA II, and 12.5% as ASA III. 87.5% of patients underwent robotic-assisted surgery, and 12.5% underwent video-assisted thoracoscopic surgery. 87.5% of patients were diagnosed with malignancy, with adenocarcinoma being the most common type. The surgical duration varied from 215 to 615 minutes, with an average of 332 minutes. Ventilatory parameters and crystalloid infusion volume were within the recommended ranges. Complications occurred on average on the third postoperative day, with desaturation requiring oxygen supplementation, leukocytosis, elevated C-reactive protein (CRP) levels, and pulmonary infiltrates on imaging studies being the primary symptoms. 87.5% of patients required intubation, and 50% needed tracheostomy due to prolonged invasive mechanical ventilation. The length of hospital stay ranged from 7 to 185 days, with an average of 59.8 days.

Conclusion: The study highlights the importance of protective ventilation strategies and cautious fluid management to prevent ALI. The findings contribute valuable insights to the multifaceted nature of ALI in the context of surgical resections, emphasizing the need for tailored approaches to enhance patient safety and surgical practices.

Keywords: Acute lung injury; Pulmonary resection; Thoracic surgery

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016

Validation of thoracic surgery mortality prediction models in a contemporary database

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Introduction: Currently, surgical resection is considered the best treatment available for early-stage lung cancer. In recent decades, minimally invasive procedures have revolutionized thoracic surgery, expanding the benefited patient population by reducing morbidity and mortality rates, incidence of complications, length of hospital stay and postoperative pain.(1) However, lung resections remain associated with significant morbidity and mortality, with national studies indicating a complication rate of 21.8% and an in-hospital mortality rate of 1.8% for video- assisted surgeries.(2) Concomitantly, various non-surgical approaches have emerged as effective therapeutic alternatives, such as stereotactic body radiation therapy. In this scenario, the importance of adequately evaluating patients and referring high-risk cases to other lines of treatment is evidenced. Mortality risk prediction models have been progressively applied as aids to this process. Recent guidelines, such as those from the British Thoracic Society and the National Institute for Clinical Excellence, advocate the use of these models as part of the selection criteria for patients undergoing elective surgeries.(3) Among the various models developed in the last 30 years, the most well- established are the European Society Objective Score, Brunelli, Thoracoscore, Modified Thoracoscore, Eurolung and Modified Eurolung. Although some of these models have been externally validated after their development, contemporary validations are lacking. Four out of these 6 models were developed using only data from patients operated before 2007 and, with current technological advances and improvement of surgical outcomes, these models are in a constant process of performance loss.

Objective: This study aims to evaluate the performance of six postoperative mortality prediction models (European Society Objective Score, Brunelli, Thoracoscore, Modified Thoracoscore, Eurolung, and Modified Eurolung) applied to a national and contemporary database.

Methods: For the analysis, data was extracted from the Brazilian Registry of Surgical Treatment of Lung Cancer, a multicenter database which currently includes data from 2,476 patients with lung cancer who underwent resection with curative intent between 2002 and 2023. Patients missing data for any essential variable ("sex", "age", "type of surgical access", "type of lung resection", "status at discharge" and "status at 30 days") or for more than 15% of other variables relevant to this study were excluded. For each model, the AUC-ROC was calculated and bootstrap technique was applied to establish confidence intervals.

Results: The database after the cleaning process included 1,832 patients. The mortality rates were 2.29% in-hospital, 3.28% after 30 days, and 4.48% after 90 days. The average survival was 35.90 months and the median survival was 26.84. Table 1 details a descriptive analysis of the study population regarding the variables applied by the benchmark models.

ROC curves with AUC and 95%-CI for each model are represented in figure 1. The AUC obtained were: 0.65 (±0.15) for Thoracoscore; 0.66 (± 0.23) for European Society Objective Score; 0.68 (±0.17) for Modified Thoracoscore; 0.74 (±0.11) for Brunelli; 0.77 (±0.08) for Modified Eurolung; and 0.79 (±0.08) for Eurolung.

Conclusion: Considering a prediction model with AUC of 0.50-0.69 as poor, 0.70-0.79 as acceptable and ≥0.80 as excellent, the only models with acceptable performance were Brunelli, Modified Eurolung and Eurolung. Furthermore, the two most recent models had the highest performances, which highlights the impact that recent advances in thoracic surgery have had on the predictive performance of older models. With these observations, the importance of developing more accurate mortality prediction models becomes evident. Machine learning is a promising tool for this purpose, to be addressed in future studies by this group, with the distinguishing feature of allowing continuous update and improvement of models as the database used is expanded.

Keywords: Lung neoplasms; Thoracic surgery; Postoperative mortality; Risk prediction

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CAAE: Not applicable.

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Table 1. Description of the study population, considering frequency and percentage for nominal variables and median and IQR for numerical variables

		Total or median*	% or IQR**
Demographic data			
Age		65.5*	13.5**
Sex	Female	1008	55.02%
	Male	824	44.98%
Preoperative evaluation			
BMI		25.94*	6.30**
ASA	I	115	6.28%
	II	1201	65.56%
	III	332	18.12%
	IV	13	0.71%
ECOG	0	975	53.22%
	1	505	27.57%
	2	48	2.62%
	3	4	0.22%
MRC	0	919	50.16%
	1	317	17.30%
	2	115	6.28%
	3	20	1.09%
	4	3	0.16%
ppoFEV1%		66.32*	22.84**
Charlson score		5*	2**
Coronary artery disease	Yes	143	7.81%
	No	1689	92.19%
Cerebrovascular disease	Yes	60	3.28%
	No	1772	96.72%
Procedure			
Classification	Elective	1824	99.56%
	Urgent	6	0.44%
Access	RATS	319	17.41%
	VATS	773	42.19%
	Thoracotomy	740	40.39%
Resection	Nodulectomy	47	2.57%
	Segmentectomy	146	7.97%
	Lobectomy	1493	81.50%
	Bilobectomy	59	3.22%
	Pneumectomy	87	4.75%
Extended resection	Yes	302	16.48%
	No	1530	83.52%

* Frequency for nominal variables and median for numerical variables; ** Percentage for nominal variables and IQR for numerical variables.

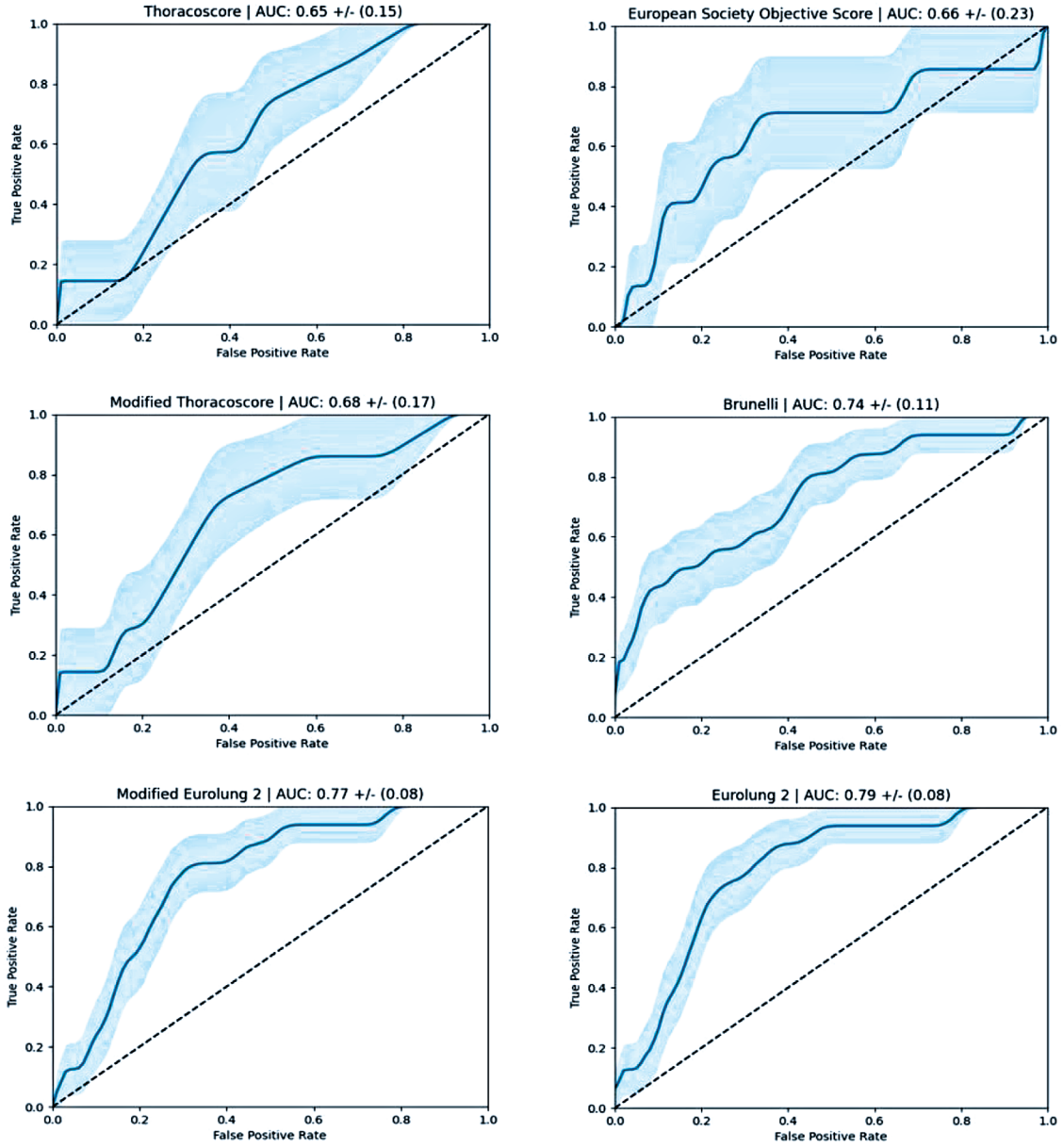

Figure 1. AUC-ROC and confidence intervals for each benchmark model

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Books
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Thesis
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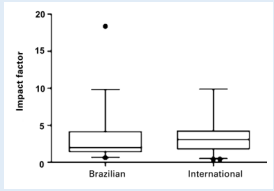
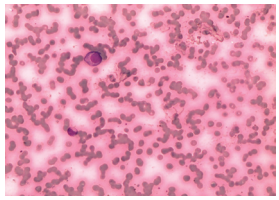
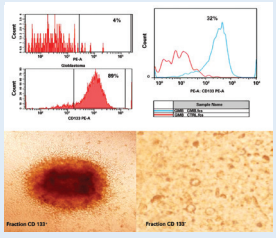
Line art	An image composed of lines and text, which contains no tonal or shaded areas		tif or eps	Monochrome 1 bit or RGB	900 to 1,200 dpi
Halftone	A continuous tone photograph containing no text		tif	RGB or Grayscale	300 dpi
Combo	Image contains halftone plus text or line art elements		tif or eps	RGB or Grayscale	500 to 900 dpi

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