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10<sup>th</sup> International Workshop on Surgical Exploration of the Mediastinum and Systematic Nodal Dissection



5<sup>th</sup> Meeting of the Thoracic Oncology, Thoracic Surgery, Techniques & Transplant, Respiratory Nursing and Respiratory Physiotherapy Areas of the Spanish Society of Pneumology and Thoracic Surgery (SEPAR)



3<sup>rd</sup> Joint Meeting of the Spanish Society of Thoracic Surgery (SECT)



30<sup>th</sup> Congress of the "Asociación Iberoamericana de Cirugía Torácica" AIACT



10<sup>th</sup> International Workshop on Surgical Exploration of the Mediastinum and Systematic Nodal Dissection



## ROBOTIC EXTENDED SLEEVE RESECTIONS FOR LUNG CANCER – JAPANESE VIEW

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Robotic extended sleeve resection is an advanced surgical technique tailored for the treatment of complex central lung cancers. These cases often necessitate the resection of more than one lobe of the lung, combined with bronchoplastic reconstruction, to maintain airway continuity. The procedure is a vital alternative to pneumonectomy, offering the dual benefits of preserving lung function and ensuring complete tumor removal. For patients with centrally located or advanced tumors, particularly those where pneumonectomy poses significant functional or quality-of-life concerns, robotic extended sleeve resection has emerged as a groundbreaking solution.

In Japan, where precision surgery and minimally invasive techniques are held to high standards, robotic extended sleeve resection has become an innovative approach to tackling these challenging cases. Japanese thoracic surgeons have adopted robotic systems to address the inherent technical difficulties of extended sleeve resections, which involve intricate airway reconstructions. The robotic platform provides unmatched three-dimensional visualization, superior dexterity, and enhanced control of surgical instruments, making it possible to perform these complex procedures with greater precision. This approach aligns seamlessly with Japan's focus on organ-preserving surgeries, ensuring that patients retain as much lung function as possible without compromising oncologic outcomes.

Robotic systems allow surgeons to meticulously execute bronchial anastomoses that are critical in multi-lobe resections. This has significantly expanded the feasibility of extended sleeve resections for tumors that previously may have required more invasive or functionally debilitating procedures. Furthermore, the minimally invasive nature of robotic surgery reduces patient morbidity, postoperative pain, and recovery times, factors that are highly valued in Japanese surgical practices.

The Japanese experience with robotic extended sleeve resections has yielded promising results in terms of safety, efficacy, and long-term outcomes. Careful patient selection is critical to success, with factors such as tumor location, lymph node involvement, and preoperative pulmonary function playing key roles in determining suitability for the procedure.

During the operation, robotic systems facilitate meticulous dissection, tumor removal, and reconstruction, particularly in anatomically challenging cases. Japanese centers of excellence have documented successful outcomes, demonstrating comparable oncologic efficacy to

traditional open approaches while minimizing surgical morbidity. Despite its many advantages, challenges remain, including the steep learning curve, longer operative times in early adoption phases, and the cost of robotic systems. Japanese surgeons are addressing these issues through dedicated training programs, collaborative research, and efforts to standardize the procedure within national surgical protocols.

In conclusion, robotic extended sleeve resection represents a significant advancement in lung cancer surgery, particularly in Japan, where it exemplifies the intersection of technological innovation and surgical expertise. By balancing oncologic rigor with functional preservation, this approach has redefined the standards of care for patients with complex central lung cancers, offering hope and improved outcomes for those with otherwise limited surgical options.