

EDITORIAL COMMENT

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A perspective to the next horizon in sublobar resections: one size doesn't fit all

The history of thoracic surgery and lung cancer is full of small accomplishments, long stagnation periods, lots of steps backwards and prodigious giant leaps forward. It all began when a French surgeon, Pean, reported the first case of a pulmonary resection of a tumour in 1861, but only after the turn of the century, in 1912, the first lobectomy for cancer was described.^{1,2} The upcoming years were full of interesting historical surgical descriptions, such as the adoption of staged lobectomy or the refinement of the technique with individual ligation and suturing, but it was only in 1960 that the term “radical lobectomy” was truly consolidated and in the following years lobectomy was fully established as a safe technique having cancer as the most common indication.³⁻⁷ Later on, the LCSG821 trial became the flag that set up for the next almost 30 years a “one size fits all” lobectomy for the treatment of early-stage lung cancer and pushed the sublobar resections into forgetfulness.⁸ The recent VATS hype got us focused on the discussion of which was the better option to enter the thorax, relegating to a secondary plane what we were doing after we get into it. Now that we have settled that minimally invasive is the way to approach the thorax, it is time to get back to oncology and to surgical technique.

The rebirth of interest in sublobar resections was empowered mainly due to the growing attention in large-scale screening trials and the increased detection of small

pulmonary nodules.⁹ The long-awaited evidence on sublobar resections is finally out and JCOG0802/WJOG4607L study may be a game-changing in thoracic surgery for the upcoming years.¹⁰ This phase III randomized controlled trial comparing segmentectomy vs lobectomy for peripheral clinical stage IA non-small-cell lung cancer (NCSLC) (≤ 2 cm and consolidation-to-tumour ratio >0.5) demonstrated an unexpected but remarkable 5-year overall survival (OS) superiority in the segmentectomy arm (94.3% vs. 91.1%, $p=0.0082$). Although the segmentectomy arm was accompanied by higher rate of local recurrence, longer operative time and more postoperative air leakage, with a reward for performing segmentectomy that fell short in terms of lung preservation, since it has only a 3.5% difference in forced expiratory volume in 1 sec between the two arms, the JCOG0802/WJOG4607L study surpassed its primary endpoint of non-inferiority and it is the first to ever demonstrate the benefit of segmentectomy with significant differences in OS.¹¹ The other titan study that thoracic community was calmly expecting is the CALGB/Alliance 140503 trial, which is also a phase III randomized study comparing lobectomy vs sublobar resection (including segmentectomies and wedge resections), having disease-free survival (DFS) as primary endpoint.¹² The freshly presented first results revealed a non-inferiority in 5-year DFS between sublobar resection (63.6%) and lobectomy (64.1%), as well

as non-inferiority in 5-year OS between the two techniques. More insight on the results of this trial must be known, in order to fully answer some questions, in particular the differences in DFS and OS in the different sub-groups of sublobar resections, as wedge resection represents 58.8% of the resections in this group.

The application of this new data in our daily practice, especially from the JCOG0802/WJOG4607L study, outside the high standard details of trial protocols, need to be further discussed, but there is no doubt that thoracic surgeons have to step up for more complex surgical procedures such as segmentectomies, masters must adapt and the upcoming generation of surgeons have to keep the pace. This commitment will necessarily bring an evolution in two main areas, a double-T challenge: Technique and Technology. For the first, surgeons will need to improve their surgical skills, with more complex and delicate dissections and embrace in more time-consuming surgeries. Without any clear global agreement on which is the better technique for performing some procedures, like complex segmentectomies or intraoperative flawless N1 dissection and evaluation, surgeons will have to walk their own way, self-exploring and adapting their current technique, leaving their comfort zone. The second point is about the growing need of technology that can and will increase surgery precision. Preoperative lung mapping and three-dimension modeling must be routinely used as it gives surgeons a major advantage and knowledge of individual anatomy before entering de operating room. Intraoperative technology should also be part of our everyday practice, with a wide spectrum of options, starting with the use of intraoperative fluorescence imaging and progressing to the use of robotics, augmented reality and even application of metaverse in surgery.

The bottom line is that thoracic surgery is facing an undeniable paradigm shift on how to treat early-stage NSCLC. As we gather more data, it comes clear that progressively we will be able to offer a unique surgery for each patient, being the sublobar resections the start of this new beginning.

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