

## Keep calm and think uniportal

After many years of no evolution in our specialty, momentum is again with us, thanks to the explosion of minimally invasive techniques making our specialty more interesting than ever. The future offers many changes for thoracic surgery, and the forces in play are complex and myriad. The modern technology and recent innovative techniques make this an incredibly exciting time for our specialty.

One of the most significant of these advances from the patient's perspective is the development of minimally invasive thoracoscopic surgery. For the past several decades, the thoracotomy was considered the gold standard approach to primary non-small cell lung cancer. But this procedure was too aggressive: big incision spreading the ribs, anesthetic control with a double lumen tube, epidural, central venous catheter, arterial line and urinary catheter.

Thanks to the improvements in technology and surgical instruments. Most of the thoracic surgical procedures can be performed by video-assisted thoracoscopic surgery (VATS), therefore resulting in less pain, shorter hospital stay and with excellent surgical outcomes.

The progress of VATS is an ongoing development and challenges to the role of a VATS major resections will never cease to emerge. The information available on Internet, live surgery events and experimental courses has contributed to the rapid learning of minimally invasive surgery during the last decade. While initially slow to catch on, the traditional multi-port approach has evolved into a single incision approach (uniportal VATS) that mimics open surgical vantage points while utilizing a non-rib-spreading small incision. The early period of uniportal VATS development was focused on minor procedures until the second phase uniportal VATS started in 2010 with the development of the technique for major pulmonary resections. The creation of specific uniportal VATS programs in high volume centers, like the Shanghai pulmonary hospital (the biggest thoracic program in the world with more than 8,000 major resections per year, *Figure 1*) has contributed to spread out the technique to a large number of surgeons from all over the world in a short period of time.

Nevertheless our speciality must continue looking for the way to offer our patients the least invasive approach possible for removing the lung cancer. Improvements in anaesthetic techniques such as non-intubated uniportal VATS, may further quicken postoperative recovery allowing the tumor resection to be performed in an ambulatory setting. Furthermore, the need to reduce the risk of intercostal nerve damage associated with the transthoracic incision has led to the recent development of uniportal subxiphoid VATS technique for major pulmonary resections.

It is interesting to note that in only a period of 6 years, uniportal VATS has further evolved into a sophisticated technique capable of performing the most complex thoracic procedures, including bronchovascular and carinal resections. Additionally, a rapid progress in instrument design and technology have brought developments of ultrahigh definition cameras, narrower and more angulated endostaplers, sealing devices for vessels, and adapted and refined thoracoscopic instruments.



**Figure 1** The Shanghai Pulmonary Hospital has performed more than 8,000 cases of thoracic surgery in 2015.

We need to assume an active role in both pursuing education in emerging technologies and fair and practical utilization of scarce healthcare resources. However, we also need to temper the desire to control costs with the real benefits that technology brings. Rationing surgical care among a faceless statistic group is very different from applying it to a living breathing patient, even when the application criteria are exactly the same. The successful marriage of cost-containment and surgical advancement is not unobtainable. In fact, Uniportal surgery is an excellent example of this. Unlike other areas of emerging technology in thoracic surgery like robotic surgery, uniportal surgery does not require a huge upfront expense for additional equipment, nor does it require expensive upkeep. There are a handful of useful surgical tools that facilitate the conversion to uniportal VATS but the procedure otherwise builds on existing technology, allowing surgeons to use existing equipment.

We truly believe in future ultramodern technology including naked 3D image systems, wireless cameras and improved uniportal robotic arms. Even though nowadays most of the surgeries can be performed by uniportal VATS, subxiphoid or awake techniques (in expert hands), the further development of technology will be crucial to facilitate the uniportal worldwide adoption and improve safety for the patient and the surgeon.

This book offers a comprehensive compilation of recent uniportal VATS articles authored by the pioneers of the technique and by some of the most experienced specialists in this field.

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