

Can the rest of the world replicate excellent segmentectomy outcomes with lower volume thoracic surgeons?

Antonela Muca, Rishindra M. Reddy

Section of Thoracic Surgery, Department of Surgery, University of Michigan, Ann Arbor, MI, USA

Correspondence to: Rishindra M. Reddy, MD, MBA, FACS. Director, Center for Surgical Innovation, Aurora, CO, USA; Associate Director, MSTCVS General Thoracic Quality Collaborative, Ann Arbor, MI, USA; Jose Jose Alvarez Endowed Research Professor in Thoracic Surgery; Professor, Section of Thoracic Surgery, Department of Surgery, University of Michigan, TC2120/5344, 1500 East Medical Center Drive, Ann Arbor, MI 48109, USA. Email: reddyrm@med.umich.edu.

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Since the JCOG0802 and CALGB140503 trials, sublobar resection for early-stage lung cancers has become increasingly common for those that meet the criteria of peripheral tumor size ≤ 2 cm and consolidation tumor ratio >0.5 (1,2). While lobectomy remains the gold standard for lung cancer resections, the outcomes after sublobar resection appear overall similar. The article by Qiu *et al.* (3) describes anatomical partial lobectomy (APL), which focuses on oncologic margin and territory of corresponding bronchi or vessels. Their technique includes 3D reconstruction of the lung based on preoperative computed tomography images. The authors reviewed 3,336 patients who underwent APL at a single institution and found a morbidity rate of 10.8% and no mortality. Given these findings, APL was deemed a safe surgical procedure.

While the authors share their impressive experience with APL, the ability to apply its use to a broader population must be considered. The authors state that APL is performed by high volume surgeons (reported as more than 300 thoracic surgical procedures per year). Given its apparent significant learning curve, this raises some concern on the ability of surgeons in other countries, including the United States (US), to become well trained in the procedure. Many lung resections in the US are performed by lower volume thoracic surgeons, who may perform less than 50 pulmonary resection cases per year and with some operations performed even by general

surgeons in more rural areas (4,5). It is not surprising that with more experience comes less operation time and lower complication rate, but this may not be achievable for the lower volume surgeon. Former data from the Premier Healthcare database in 2011–2015 suggests that approximately 70% of lobectomies performed in the US are done by surgeons who perform <20 lobectomies annually (6), which is significantly less than the surgeons reported in the current study.

The authors state that a 3D reconstruction software is used for preoperative planning; however, further details are not provided. It is unclear whether this software was developed internally or whether it is a commercially available product. We agree with the authors that this technology is likely beneficial; however, the cost of the technology must also be considered. Recent quotes to use similar software are estimated to be \$250–300 per case in the US market (personal communications between Dr. Reddy and multiple companies), without it being clear who would pay for this service, as this may come out of the surgeon's pocket in a capitation payment system. This is not feasible for the surgeons to take on, despite its helpfulness in operative planning.

APL, as described by Qiu *et al.* (3), is promising for patients requiring pulmonary resection and may become the future preferred operation for all small tumors. This is a strongly powered study with a large sample size suggesting

that APL is a safe and feasible operation; however, some challenges arise when considering applicability to other countries and regions due to surgeon volume and experience.

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