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Commentary: Is it always greener on the other side?

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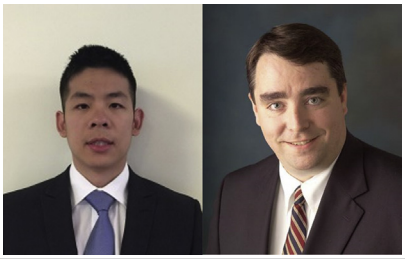

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CENTRAL MESSAGE

In an era when anatomic segmentectomy has emerged as a valid option for stage I non–small-cell lung cancer, the use of continuous intravenous indocyanine green infusion can help identify intersegmental planes.

Throughout the last several decades, technological improvements have pushed thoracic surgery to new limits. With the introduction of minimally invasive and robotic techniques, lung resections have continued to evolve, and outcomes have improved dramatically. As we eagerly await the results of the Cancer and Leukemia Group B (CALGB) 140503 trial, multiple studies conducted over the last 2 decades have suggested that anatomic segmentectomy has a place as an uncompromised oncologic operation for patients with stage I non–small-cell lung cancer (NSCLC).[1,2]

One of the more daunting technical steps of an anatomic segmentectomy is identifying the intersegmental planes. This is crucial not only for the oncologic portion of the procedure, but also to minimize postoperative morbidity. In 2010, Misaki and colleagues[3] were among the first to systemically apply indocyanine green (ICG) intraoperatively in 8 patients undergoing segmental pulmonary resection. With the use of infrared thoracoscopy, they were able to identify clear intersegmental demarcation in all patients.[3] This technique has since been modified several times to identify the optimal way it should be performed.[4,5] In the present study, the same group has continued to build on their initial efforts by proposing the use of a constant-rate infusion of ICG at the time of surgery.[6] They found that a continuous infusion was associated with enhanced demarcation of the intersegmental planes during infrared thoracoscopy compared with a single bolus.

Currently, there is no consensus for what represents the optimal technique for identifying intersegmental plans during anatomic segmentectomy. To ensure adequate resection, several studies have described performing anatomic segmentectomies with extension of the resection planes into neighboring segments.[7,8] Additional techniques include a combination of deflating and inflating either the segment in question or the surrounding lung parenchyma.[9] Although this technique does not involve the use of an additional substance, cross-ventilation via the pores of Kohn may theoretically limit its utility. Compared with aeration, minimal side effects have been associated with ICG at the dosages used in the present study while improving the signal visualized during infrared thoracoscopy.[6] Ultimately, the selection of demarcation technique will be based on reliability, ease of use, and surgeon preference. What is irrefutable is the application of these methods in the educational setting. With the combination of preoperative 3D reconstruction from computed tomography scans,[10] the use of such intraoperative techniques as ICG or insufflation will undoubtedly help teach current and future cardiothoracic trainees the nuances of segmental anatomic resection. We envision continued integration of technology in real time to assist in minimally invasive and robotic lung resection. We congratulate Dr Misaki and colleagues for pushing the envelope in an effort to improve surgical techniques in anatomic segmentectomy.

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