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Commentary: Should the surgical tactics of segmentectomy be planned on the anatomy of the segmental veins?

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Currently, the role of sublobar resection in the treatment of non-small cell lung cancer (NSCLC) is a hot topic. While guidelines support the use of segmentectomy to treat early-stage NSCLC presenting as pure ground-glass opacity or predominantly ground-glass opacity in patients fit for surgery,¹ the use of segmentectomy to treat solid NSCLC lesions is still controversial.² The results of 2 controlled randomized trials (Cancer and Leukemia Group B/Alliance 140503 and Japan Clinical Oncology Group 0802) are awaited and should shed light on this exciting question.^{3,4} The number of segmentectomies performed each year continues to increase despite the well-recognized complexity of the procedure caused by numerous bronchovascular anatomical variations.

In the current issue of *JTCVS Techniques*, Nakazawa and colleagues present a standardized approach for right upper lobe (RUL) segmentectomy based on the venous drainage pattern and identification of the intersegmental veins.⁵ Thirty-four patients underwent preoperative 3-dimensional computed tomography reconstruction of the RUL bronchovascular structures then underwent segmentectomy guided by the computed tomography findings. The authors, using

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Right upper lobe segmentectomies are facilitated by standardized surgical approaches based on anatomical modeling of the venous drainage and intersegmental veins of the right upper lobe.

anatomical modeling they previously described,^{6,7} classified the anatomy of the RUL main vein branches into 1 of 4 major types, and the drainage pattern of the intersegmental veins was classified into 1 of 14 subtypes. Based on this classification, an anterior, interlobar, or posterior/bronchial approach was used to perform the segmentectomy, which facilitated identification of the intersegmental vein and, consequently, its division. All patients were classified into 1 of 4 previously described anatomical models. Importantly, in 4 patients (12%), the standard approach to RUL segmentectomy was changed because an uncommon anatomical subtype was identified.

The article by Nakazawa and colleagues highlights the importance of surgical planning before complex procedures. A systematic and methodic surgical approach guided by preoperative imaging studies of the drainage pattern of the RUL veins can potentially optimize surgical outcomes. With the use of this objective surgical tactic, hesitation and futile movements are reduced, favoring a fluid anatomical dissection with precise identification of the segmental vein. Moreover, accurate recognition of the anatomy of the intersegmental veins and their spatial relationship with the tumor might enable better definition of the surgical margins. Interestingly, 8 of the 34 patients underwent bi-segmentectomy, segmentectomy plus subsegmentectomy, or 2 subsegmentectomies from adjacent segments. We

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speculate that the authors' anatomical modeling was a decisive factor in electing these types of resection and contributed to their success.

Our main concerns with this anatomical model are its reproducibility and applicability to day-to-day practice. It is well known that there is great value in understanding lobar anatomy with the use of preoperative 3-dimensional reconstructions methods. However, the authors went a step further to propose surgical strategies after classifying the anatomic variations of RUL vein branches. Despite a great effort from the authors to simplify RUL segmentectomies and the excellent oncologic and surgical outcomes, this surgical strategy is not intuitive. Also, due to the small sample size, the impact of this proposed model on clinical practice remains unclear. We congratulate the authors for their innovative concept and outstanding work trying to simplify a complex procedure through the knowledge of the anatomy of the segmental RUL veins. We believe that standardizing complex procedures improves outcomes. Here, the authors have shown that coupling routine modeling with standardized surgical approaches to segmentectomy is feasible. Certainly, the readers will have a different perspective while planning

and performing RUL segmentectomies after reading this study.

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