



Imagine your operation

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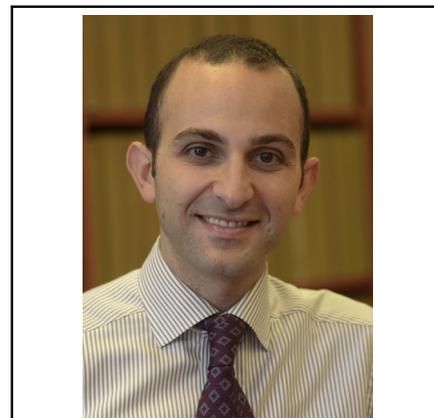
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Pulmonary vascular anatomy is by no means constant, with countless reported variations and likely more to come. In this issue of the *Journal*, Sumitomo and colleagues¹ report on yet a new state of the superior pulmonary vein, one in which V1-V3 courses posterior to the truncus anterior of the pulmonary artery. By using preoperative 3-dimensional imaging, they were able to carry out a video-assisted thoracoscopic surgery lobectomy successfully, while avoiding vascular injury and the need to convert to thoracotomy. Although the rest of us are unlikely to ever encounter this specific anatomic variation, this report brings to our attention an important concept that we should understand as thoracic surgeons.

We were always taught to “imagine” our operations. Endless hours are spent by surgeons reconstructing images in our mind: the relationships of pulmonary vascular anatomy, the superior sulcus, the thoracic inlet, or the Belsey fundoplication. Mental images are powerful, but also ephemeral, nonsharable, unteachable, nonreproducible, and prone to error. Fortunately, imaging technology has greatly enhanced our imagination. It is inconceivable in this day to operate on a lung lesion without a computed tomography image and a positron emission tomography scan. For smaller lesions, localization techniques with fiducials² or electromagnetic navigation^{3,4} are being increasingly reported. For complex operations in the superior sulcus, 3-dimensional models are being printed to help visualize and touch the anatomy before resection.⁵

We now live in an era in which we are pushing the boundaries of classic thoracic surgery. Lung cancer screening has ushered in the practice of targeted sublobar resection that is challenging the need for lobectomy in small tumors. We are becoming more liberal in performing metastasectomy with maximal lung preservation. We are operating on T4 tumors that we once thought were nonresectable. None of this



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Central Message

Image-guided surgery plays a central role in the future of our specialty.

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would have been possible without advances in image-guided surgery. None of this will be improved on unless we master image-guided surgery. Why simply imagine when you can see, touch, feel, deconstruct, reconstruct, discuss, learn, and teach?

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