Commentary: The “somewhat promising” case for near-infrared intraoperative imaging

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Central Message

Clearly, although it is somewhat promising, near-infrared intraoperative imaging will need more study before its role in metastasectomy is defined.

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The article in this issue of the *Journal*, “Near Infrared (NIR) Intraoperative Imaging for Minimally Invasive Pulmonary Metastasectomy for Sarcomas,”¹ provides some data from a series in which near-infrared (NIR) intraoperative imaging technology was used as an aid for resection of sarcomatous lung metastases.

Whenever we discuss metastasectomy, there are myriad questions. It seems intuitively likely that finding and resecting more (or all) lung metastases would provide better long-term outcomes. Sarcomas have a propensity for both lung metastases and recurrences. In a report from Memorial Sloan Kettering on 539 patients with sarcomatous lung metastases, 63% had a recurrence some time after lung resection.² The unfortunate part is that outcome is very dependent on tumor biology, and there is ample data that, once you get to higher numbers of lung metastases (>5), it becomes unclear whether there is benefit from surgery.

This article¹ chronicles the use of NIR intraoperative imaging in 30 patients. Of these, 10 were approached through thoracotomy and 20 through video-assisted thoracoscopic surgery (VATS). The additional value provided by finding metastases not seen on imaging or felt by palpation was, as expected, more prominent in the VATS group. There were additional metastases identified, as well as 3 false-positive nodules. If NIR intraoperative imaging is worthwhile, it probably will add more to VATS procedures, in which palpation is limited.

Several factors about NIR imaging are worth noting. It is fairly expensive, adding \$1500 to \$2500 per case. Lesions deeper than 2 cm or smaller than 5 mm are often missed with NIR imaging. Sarcomas are probably the best for

NIR imaging, and its utility has not yet been proved for other cell types.

The case for NIR near-infrared intraoperative imaging in my opinion would be its use in patients undergoing VATS resections who are believed to have only a few metastases, in which case finding the additional lesions might reduce the need for future surgery and might prolong survival. Already, there are data to support less morbidity with VATS than with open approaches, and maybe this technology could address its weakness of less ability to palpate the lung.

Clearly, although it is somewhat promising, NIR intraoperative imaging will need more study before its role in metastasectomy is defined.

References

1. Predina JD, Newton AD, Corbett C, Shin M, Sulfyok LF, Okusanya OT, et al. Nearinfrared intraoperative imaging for minimally invasive pulmonary metastasectomy for sarcomas. *J Thorac Cardiovasc Surg*. 2019;157:2061-9.
2. Chudgar NP, Brennan MF, Tan KS, Munhoz RR, D'Angelo SP, Bains MS, et al. Is repeat pulmonary metastasectomy indicated for soft tissue sarcoma? *Ann Thorac Surg*. 2017;104:1837-43.