Commentary: Colorectal lung metastases and the scalpel versus the beam

Christopher Cao, MBBS, PhD,^{a,b} and James Huang, MD^a

From the ^aThoracic Service, Department of Surgery, Memorial Sloan Kettering Cancer Center, New York, NY; and ^bDepartment of Cardiothoracic Surgery, Royal Prince Alfred Hospital, Sydney, Australia.

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Address for reprints: James Huang, MD, Memorial Sloan Kettering Cancer Center, 1275 York Ave, New York, NY 10065 (E-mail: huangj@mskcc.org).

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Christopher Cao, MBBS, PhD (left), and James Huang, MD (right)

Central Message

Although stereotactic body radiotherapy is increasingly being used to treat pulmonary metastases of colorectal origin, surgery appears to result in fewer recurrences and remains the preferred choice.

See Article page 1234.

The popularization of stereotactic body radiotherapy (SBRT) for the treatment of pulmonary metastases has followed its success for primary lung cancers, with as many as 90% of European centers reporting the use of SBRT for pulmonary metastases.¹ Colorectal cancers represent the second most common origin of pulmonary metastases, and Nelson and colleagues² are to be commended for their analysis in this issue of the *Journal* comparing local recurrence rates of SBRT versus wedge resection for colorectal pulmonary metastases at the level of the individual nodule. In their study of 826 pulmonary nodules in 381 patients, SBRT was associated with a significantly higher incidence of local recurrence, with a hazard ratio of 3.28. This finding remained statistically significant when analysis was limited to propensity-matched cohorts, with a local recurrence rate of 14.1% at 2 years for nodules treated with wedge resection versus a rate of 29.4% for those treated with SBRT.

These findings are important but should be interpreted with caution. As Nelson and colleagues² acknowledge, one of the major limitations of this nonrandomized observational study is the intrinsic selection bias behind the choice of SBRT versus surgery for any given nodule. Ninety percent of the patients in the study underwent surgery. Patients who underwent SBRT had solitary lesions, or 2 lesions at most; among patients who underwent wedge resection, none had solitary lesions, and some had 5 nodules. No information about the location of nodules was provided. It is possible that the nodules treated by SBRT were not amenable to wedge resection. Thus, whereas most nodules treated with wedge resection could possibly have been treated with SBRT, the converse may not be true. Other important factors in deciding between SBRT and surgery include performance status, comorbidities, and pulmonary function, but these variables were not included in the propensity model. Importantly, 66% of the nodules treated by SBRT were not histopathologically confirmed to be malignant, which raises questions about the observed

outcomes in those patients. Patients deemed to have operable disease generally have fewer morbidities than those deemed to have inoperable disease and therefore treated with SBRT, and this bias may favor clinical outcomes for the surgical arm. Other limitations include the heterogeneity of the systemic therapy regimens in both groups and the relatively short radiographic follow-up (1.8 years for SBRT).

If SBRT is indeed less efficacious than surgery for the treatment of colorectal cancer pulmonary metastases, an explanation may lie in the growing clinical evidence that colorectal pulmonary metastases are associated with higher radioresistance than non-small cell lung cancer and other histologic subtypes.³ This hypothesis is supported by Ahmed and colleagues,⁴ who calculated radiosensitivity indices with a 10-gene assay to differentiate the response of pulmonary metastases to SBRT on the basis of different histologic origins. Their study reported that rectal cancers in particular were relatively more radioresistant than breast, renal, and colon pulmonary metastases, and the biologically effective dosage for SBRT may therefore need to be increased to optimize local control of rectal metastases.

Ultimately, the findings of Nelson and colleagues² suggest that surgery remains the preferred option relative to SBRT in operative candidates with colorectal metastases.

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