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## Commentary: We are in the same minimally invasive boat, and we have to row in the same direction

Luca Bertolaccini, MD, PhD,<sup>a</sup> and  
Lorenzo Spaggiari, MD, PhD<sup>a,b</sup>

Despite the superiority of robotic-assisted thoracic surgery (RATS) over video-assisted thoracic surgery (VATS) for mediastinal masses, in this issue of the *Journal*, Alushani and colleagues<sup>1</sup> confirm the broad availability of VATS in most of the developing world, owing to the higher costs and inconsistent accessibility of RATS.

Since the 1990s, the awareness of minimally invasive surgery has grown extensively, thanks to its remarkable benefits compared with thoracotomy.<sup>2</sup> Several studies have verified that minimally invasive approaches are not inferior to thoracotomy in terms of oncologic outcomes. The advantages of RATS in dexterity and depth of visualization delivered facilitates execution of more complicated procedures and increases the visual strain for surgeons.<sup>3</sup> Like the debate stimulated by the introduction of VATS, RATS also needed to address challenges, such as cost-effectiveness.<sup>4</sup> Despite comprehensive cost analysis reviews, there are no prospective cost comparisons or cost-effectiveness analyses. The higher costs of RATS were demonstrated in systematic reviews and meta-analyses. Nevertheless, quality and rigor are challenged by the retrospective nature and limited sample size of included studies.<sup>5</sup> Most of them included heterogeneous patients in terms of disease stage and comorbidity and did not use propensity matching.<sup>6</sup> Therefore, conclusions regarding the cost-effectiveness are not possible in

From the <sup>a</sup>Department of Thoracic Surgery, IEO, European Institute of Oncology IRCCS, Milan; and <sup>b</sup>Department of Oncology and Hemato-Oncology, University of Milan, Milan, Italy.

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Address for reprints: Luca Bertolaccini, MD, PhD, Division of Thoracic Surgery, IEO, European Institute of Oncology, IRCCS, via Ripamonti 435, 20141 Milan, Italy (E-mail: [luca.bertolaccini@gmail.com](mailto:luca.bertolaccini@gmail.com)).

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Luca Bertolaccini, MD, PhD (left), and Lorenzo Spaggiari, MD, PhD (right)

### CENTRAL MESSAGE

Conclusions regarding the cost-effectiveness of robotic surgery are not possible without prospective long-term data. Even assuming that costs represent a real issue, they will decrease with technological advancements.

the absence of prospective long-term data.<sup>5</sup> Even if the cost of RATS (especially in a time of increasing healthcare expenditures) is a real issue, the device-related costs will decrease with advances in the technologies.<sup>3</sup>

Rather than discuss the costs of each approach against the others, we should discuss oncologic efficacy across the minimally invasive approaches and then highlight nononcologic outcomes. Intuitively, everyone would support minimally invasive surgery, via VATS or RATS, if it were able to offer the required decrease in morbidity and at least comparable (if not enhanced) oncologic outcomes. Ideal statistical comparisons of minimally invasive approaches and thoracotomy in terms of cost will continue to be challenging. The result is a time of vagueness when minimally invasive approaches could take root in practice and allows a chance for innovation in standards of care.<sup>7</sup>

Therefore, minimally invasive surgeons should row in the same direction—but which direction precisely? The bright and consistent communication between VATS and RATS surgeons will be crucial; otherwise, technological improvements and cost reductions will be left in the dark. So minimally invasive teams should keep in the loop toward the development of a unique, more reliable, and dynamic minimally invasive team. Imagine what patients could achieve if minimally invasive surgeons could work together in their areas of giftedness, regularly and over a long period, all

rowing in the same direction. As one opportunity leads to another, before you know it, RATS and VATS surgeons will look up and say “mission accomplished.”

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