Dr Servais reported consultant for Intuitive Surgical.

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major cost difference was based on OR time using a previous-generation robotic system. First, modern-generation robotic systems have little to no additional time required for positioning and docking, and operative time has been shown to be equivalent by Zhang and colleagues¹ or even improved compared with video-assisted thoracic surgery (VATS).³ Second, contemporary studies on cost, such as that by Kneuert and colleagues,³ have shown equivalent hospital costs when comparing robotic with VATS lobectomy.

Most importantly, however, the assertion that robotics “does not improve clinical care” is both biased and short-sighted. Zhang and colleagues and others have shown improved lymphadenectomy with robotic-assisted lobectomy compared with VATS. It is easy to ignore this fact, but multiple studies have now demonstrated robotics facilitates a more complete lymphadenectomy, including the 2017 report from Memorial Sloan Kettering Cancer Center in *The Annals of Surgery*.⁴ In fact, an international group lead by Flores published data on lymphadenectomy in the setting of lung resection for non-small cell lung cancer in the *Journal of Thoracic Diseases*⁵ highlighting the importance of adequate lymph node harvest, which “influenced recurrence-free survival” and should be performed “not only to identify the positivity of resected lymph nodes but also to determine an accurate tumor nodal stage.” Furthermore, robotics has contributed to the overall increased use of minimally invasive surgery for lung cancer by surgeons who were otherwise performing open thoracotomy routinely—an important impact with direct patient benefit.

Technology will continue to improve, and thoracic surgeons should embrace robotics now, as the patient benefit will only become more impactful with time. Robotic costs are a moving target, and published cost comparisons with VATS have been variable. However, an unbiased assessment, free of confirmation bias, reveals that when the technology is used properly there is little doubt robotic anatomic pulmonary resection for lung cancer is safe, efficacious, and at worst, equivalent to VATS. Time will tell if robotics can actually improve outcomes and cost. Let’s avoid condemning robotics based on confirmation biases and keep an open mind to encourage further study, innovation, and progress.

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REPLY: ROBOTIC-ASSISTED LUNG RESECTIONS: OBJECTIVE OBSERVATIONS 20

YEARS LATER

Reply to the Editor:

In a recent Letter to the Editor, Dr Servais voices concern over possible bias in our assessment of the robot’s limited clinical utility in lung resection.¹ Let us take a broader look to consider where true bias most likely originates in this discussion.

Our position stems from 20 years of operative experience comparing robotics, video-assisted thoracic surgery, and open surgery techniques, as well as multiple publications without financial ties to large corporations. In contrast, the majority of large-scale publications touting the benefits of robotic lung resection have been authored by surgeons participating in active financial relationships with DaVinci’s parent company, Intuitive Surgical. By definition, it is impossible to provide unbiased support for robot-assisted techniques while receiving compensation from the world’s leading robotics company, with a current market cap valued at \$88 billion USD.²

Unfortunately, despite the complicated statistics used in comparative robotic cost analyses, there undoubtedly remains a significant financial investment required to purchase a \$2.3-million robot, its required disposable equipment, and to maintain its upkeep.

The reference to a 2017 study in the *Annals of Surgery*³ is flawed. We previously examined this study and found several significant weaknesses, including misrepresentation

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FIGURE 1. The chairman's coat upon its hanger in the thoracic operating room.

of true conversion rates, lack of difference in nodal or tumor–node–metastasis upstaging, and missing information regarding patient comorbidities, cost, and operative time.⁴

Mediastinal lymph node dissection does not improve survival over lymph node sampling for early-stage non–small cell lung cancer.⁵ We maintain that nodal yields are not a function of the instruments, but of each oncologic surgeon's effort, and we continue to look for an effective application of this technology for lung resections at our institution (Figure 1).

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REPLY: THE CONTINUED DEBATE ON ROBOTIC SEGMENTECTOMY— AGREE TO DISAGREE

Reply to the Editor:

We deeply appreciate the letter from Servais¹ and the previous commentary from Song and Flores,² which provide us with contrasting perspectives on the comparison between robot-assisted thoracic surgery (RATS) and video-assisted thoracic surgery. Confirmation bias may be inevitable, yet the open-ended debate can lead us to an in-depth reflection of existing evidence.

When it comes to new technology, the cost of time and money has always been a primary consideration. The vague statement of operative time in our original article³ was questioned in the commentary from Song and Flores² and was later clarified in our reply.⁴ Indeed, the exclusion of positioning and docking time might cause bias in the analysis. Servais,¹ however, noticed that the updated robotic system had shortened the preparation time. In contrast, the hospital cost of RATS surgery varies from regions and time periods.^{3,5,6} Different conclusions can be drawn due to distinct settings, but the unified aim of iterated robotic system should be an improved accessibility regarding both time and monetary cost.

Another debate has zoomed in on the substantial clinical advantages of RATS. In agreement with Servais,¹ we regard Song and Flores' assertion of "does not improve clinical care"² as condemnation. As their commentary has mentioned, nodal upstaging serves as a more relevant factor to adjuvant treatment strategy, but the significance of improved lymphadenectomy facilitated by RATS should never be neglected, especially for an accurate nodal staging. The extent of lymph node resection has been widely