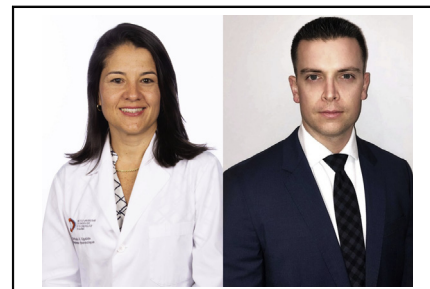


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## Commentary: Sleeve lobectomy for centrally located non–small cell lung cancer: Should the approach be a matter of debate?

Arthur Vieira, MD, and Paula A. Ugalde, MD



Paula A. Ugalde, MD, and Arthur Vieira, MD

A groundbreaking manuscript from Deslauriers and colleagues<sup>1</sup> established sleeve lobectomy, rather than pneumonectomy, as the ideal surgical treatment for centrally located non–small cell lung cancer (NSCLC). In this work, patients with NSCLC underwent sleeve lobectomy via an open approach with low operative mortality, morbidity, and excellent oncologic outcomes. It is one of the largest cohorts published to date.

Over the last 20 years, video-assisted thoracoscopic surgery (VATS) for lung resection became the standard approach for the treatment of early-stage lung cancer due to better pain control, faster return to daily activities, and reduced length of hospital stay and chest tube insertion as compared with open surgery.<sup>2-5</sup> Currently, there is a great interest in robotic surgery due to its improved ergonomics, better imaging, increased range of movement, and gentler learning curve as compared with VATS.<sup>6-8</sup> At high-volume centers, as surgeons gain experience with VATS and robotic surgery, more challenging cases are managed with these minimally invasive approaches. This reflects the natural instinct of the thoracic surgeon to push the limits of surgical technology without compromising safety and the quality of the oncologic resection.

In the current issue of *Journal*, Qiu and colleagues<sup>9</sup> present their experience with sleeve lobectomy in 188 patients with NSCLC over a 5-year period (2012-2017): 66 by open thoracotomy, 73 by VATS, and 49 by robotic thoracoscopic surgery. Using matching weights, they found an overall 90-day mortality of 2.1% and overall morbidity of 26.6%, with no statistically significant differences

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### CENTRAL MESSAGE

Robotic surgery led to the best postoperative outcomes after sleeve lobectomy when compared with VATS and thoracotomy. Robotic platform is a valuable surgical tool for centrally located lung cancers.

between approaches. In pairwise comparisons, the robotic group had lower estimated blood loss, shorter operative time, and shorter duration of chest drainage as compared with the VATS and open groups. Although 8.8% of VATS group and 1.7% of the open group had an incomplete resection, all surgical margins were negative in the robotic group (0% incomplete resection). Lymphadenectomy and complications were similar between the 3 groups. When Kaplan–Meier survival curves were examined, no statistically significant differences were found in disease-free survival when comparing robotic versus VATS or open approaches. Overall survival (OS) after open surgery was inferior to OS survival after robotic surgery (3-year OS: 59.3% [95% confidence interval, 0.43-0.72] vs 89.7% [95% confidence interval, 0.75-0.97]; log-rank, adjusted  $P = .007$ ). No statistically significant differences in OS were observed between the robotic and VATS approaches and between the VATS and open surgery.

The main strength of this study is the high number of patients who underwent sleeve resection. The findings make us wonder whether robotic surgery may be safer than other approaches and offer superior oncologic results to patients with centrally located tumors who undergo sleeve lobectomy. Further study is needed to establish whether robotic sleeve lobectomy leads to superior outcomes. We can at least accept, based on this study and others, that complex procedures such as sleeve lobectomy can be performed minimally invasively with noninferior results to open surgery

in experienced hands. Because the learning curve for robotic surgery seems gentler than the learning curve for VATS, surgeons might choose to transition from open techniques to robotic surgery without doing VATS. It will be interesting to see how the current generation of surgical trainees chooses to adopt minimally invasive approaches. Although the evidence is weak supporting robotic surgery over other approaches and the cost of the robotic platform is a limitation, the use of robotic surgery is growing exponentially. One way or another, minimally invasive thoracic surgery is here to stay and is rapidly evolving.

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## Commentary: Minimally invasive sleeve lobectomy—from case report curiosity to standard of care?

Nirmal K. Veeramachaneni, MD



Nirmal K. Veeramachaneni, MD

In this issue of the *Journal*, Qiu and colleagues<sup>1</sup> report on their experience with 188 patients undergoing sleeve lobectomy from 2012 to 2017. What is remarkable is the volume of procedures and their ability to transition from thoracotomy, to video-assisted thoracoscopic surgery (VATS), to a robotic platform in a short time frame. For this complex operation, the authors noted a mortality

**CENTRAL MESSAGE**

Robotic and VATS sleeve lobectomy is feasible. Surgeons who have reported excellent results have considerable experience with minimally invasive techniques.

rate of 2.1%, with no conversions to open surgery in either the VATS or robotic groups, and no difference in complications. Their latest technique used the robot—length of stay, operative time, and blood loss were all least within this group. Given the inherent selection bias and

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