

LETTER TO THE EDITOR

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Uniportal robotic surgery – another era in thoracic surgery

Minimally invasive techniques, typified by video-assisted thoracoscopic surgery (VATS), are widely practiced in the treatment of thoracic diseases all around the world, and VATS has been recognized as a standard treatment method for early staged lung cancer. Robotic-assisted thoracoscopic surgery (RATS), has emerged as a next-generation technique in the field of minimally invasive surgery and is also gaining its popularity with the idea of Enhanced Recovery After Surgery deeply rooted in patients' minds. The robotic platform has some technical advantages over VATS, including a three-dimensional operative view, intuitive use of the robotic hands, and increased instrument flexibility; therefore, it has the potential to surpass VATS in the handling of more complex cases and may facilitate lymph node dissection.

Currently, RATS requires 3 or 4 ports and 1 or 2 assistive incisions. However, the uniportal approach, is very appealing to surgeons due to involving potentially less postoperative pain and higher patient satisfaction with respect to the number of incisions. Pure uniportal robotic-assisted thoracic surgery (U-RATS) is the robotic thoracic surgery performed through a single intercostal incision, without rib spreading, using the robotic camera, robotic dissecting instruments and robotic staplers. Compared to multiport, U-RATS simplifies the

management of possible intraoperative bleeding, mainly due to rapid undocking and the necessary uniportal experience of the surgeon. U-RATS offers a possible uniportal robotic surgical management of lung resections, with comfort for surgeons and quick and smooth recovery for patients.

RATS has a steep learning curve compared to VATS, and it was proposed that 15 to 20 operations are required to establish a learning curve for RATS anatomical pulmonary resections. Learning curve has no negative effect on conversion rate, need for blood transfusion, upstaging, or length of stay in RATS. Moreover, developing experience lead surgeons to obtain shorter operative times, operate larger tumors with more advanced stages, and have an increased number of the dissected lymph nodes.

In fact, one potential advantage of the robotic approach over traditional VATS is the increased radicality. While the benefit of the robotic approach over open thoracotomy is directly related to reduced surgical trauma and the improved tolerability in fragile patients that have received induction treatment. In case of occult N2 disease, RATS can translate into a quicker recovery with improved compliance with adjuvant treatments following surgery. The robotic instrument technology allows sharp and controlled dissection compared

to the typical blunt sweeping methods used in most VATS lobectomy techniques.

U-RATS is a safe and feasible technique, combining the advantages of U-VATS with the well-known advantages of robotic surgery. With better vision, higher maneuverability, and more static movement than VATS, the ability of RATS to perform fine manipulation tasks and lymph node dissection has been greatly improved. Moreover, most major intraoperative complications can be safely managed robotically without conversion to thoracotomy.

The paradigm shift—encapsulated by the phrase “from maximum tolerated treatment to minimum effective treatment”—that has involved many areas of surgical oncology, may now also be widely adopted by thoracic surgeons.

REFERENCES

1. Gonzalez-Rivas D, Bosinceanu M, Motas N, Manolache V. Uniportal robotic-assisted thoracic surgery for lung resections. *Eur J Cardiothorac Surg*. 2022 Aug 3;62(3):ezac410.
2. Mercadante E, Martucci N, De Luca G, La Rocca A, La Manna C. Early experience with uniportal robotic thoracic surgery lobectomy. *Front Surg*. 2022 Sep 23;9:1005860.
3. Terra RM, Leite PHC, Dela Vega AJM. Robotic lobectomy: how to teach thoracic residents. *J Thorac Dis*. 2021 Aug;13(Suppl 1):S8-S12.
4. Choe G, Park B. Robotic-assisted thoracoscopic surgery (RATS) lobectomy. *Ann Cardiothorac Surg*. 2019 Mar;8(2):296-299.

