



Effectiveness of minimally invasive thymectomy versus open: comments on an international registry analysis

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Comment on: Burt BM, Yao X, Shrager J, *et al.* Determinants of Complete Resection of Thymoma by Minimally Invasive and Open Thymectomy: Analysis of an International Registry. *J Thorac Oncol* 2017;12:129-36.

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Although thymectomy represents one of the most common surgical procedure in the field of thoracic surgery, it is still one of the operations with more pending issues, both in terms of surgical indications and technique.

One of the main concerns, particularly when dealing with thymectomy for thymic tumors, is represented by the debate between open and minimally invasive approaches.

Differently from other surgical fields, the spread of thorascopic/robotic approach has been extremely slow: the main reasons contributing to this delay are both surgical and oncological. The difficulty to operate in a narrow and delicate region as the mediastinum, the relative rarity of the thymic neoplastic diseases and their frequent indolent nature, with no clear data on long-term oncological outcome available yet, led several authors to consider the minimally invasive thymectomy still an experimental procedure needing more scientific evidence. It is clear, however, as for all rare diseases, that a randomized controlled trial will never be performed, thus we have to base our judgment only on the available studies (mainly retrospective) (1).

In a recent meta-analysis performed by Friedant and colleagues, no significant difference in terms of R0 resection rate and local recurrence was found between open and minimally invasive resection of early stage thymic tumors (2). Other authors have compared their Institutional experience with open and minimally invasive approaches, but focused mainly on the surgical aspects (3-8).

It is then particularly important the analysis performed by Burt and Colleagues recently published on the *Journal of Thoracic Oncology* using the ITMIG retrospective database

[1997–2012] (9).

The two main topics analyzed in this work are the surgical efficacy of minimally invasive techniques for thymoma resection compared to open approaches and the differences in terms of surgical approach and technique around the world.

From a statistical point of view, although being retrospective, this analysis has the advantage of a large sample size including a worldwide experience. Moreover, in a rare disease like thymoma, where it is not easy to perform an adequately powered randomized controlled trial, propensity score matching on non-randomized data seems the best and most feasible alternative.

When analyzing the oncological outcome, despite the large retrospective database, the authors faced the same problems of the previous studies on this topic, in particular the reduced follow up for the minimally invasive approaches, as 73% of the procedures have been performed between 2009 and 2012. This made it difficult to obtain clear data regarding the oncological appropriateness of minimally invasive thymoma resection, thus recurrence has not been considered as a primary outcome measure. Being the resection status one of the main prognostic factors, the analysis has been then focused on the difference in resection rates between the two approaches, and confirmed the data already published by Friedant and Colleagues. Anyway, these results are not conclusive, requiring further data over the oncological effectiveness of the minimally invasive techniques.

Another interesting point is the different approach to thymic malignancies in the different continents. A recently

published work by Fang and Colleagues, also based on the ITMIG retrospective database, showed that there are some specific differences regarding the surgical approach to early stage thymic malignancies: in Asia, partial thymectomy is more often performed and, accordingly, minimally invasive approaches are more common, with identical R0 resection rate compared to Europe and North America (10). Moreover, the choice of the extent of thymectomy (total *vs.* partial) is influenced by the tumor dimension and the surgical approach (open *vs.* minimally invasive). The same data are deductible in the Burt's work. The difference in the extent of resection is an important matter in this field and, in a moment where there are still many doubts over the minimally invasive approaches, there should be a common practice to avoid adding a bias. Indeed, as stated by the recent ITMIG guidelines, resection of thymoma should be performed together with the entire thymic gland (11). As reported in the paper based on ITMIG database, only a minority of patients undergo partial thymectomy through an open approach, this raises the suspect that sometimes the choice of a partial thymectomy, during minimally invasive approach, is due to technical more than methodological reasons. In our opinion, surgeons should then prefer any technique that makes them able to perform a complete dissection of the gland.

In conclusion, the work of Burt and Colleagues has partially clarified some controversial points even with the limitations of the retrospective fashion of the analysis. Prospective Registries, as the ITMIG prospective database, are probably the way to obtain more clear data and answers.

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aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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References

1. Marulli G, Maessen J, Melfi F, et al. Multi-institutional European experience of robotic thymectomy for thymoma. *Ann Cardiothorac Surg* 2016;5:18-25.
2. Friedant AJ, Handorf EA, Su S, et al. Minimally Invasive versus Open Thymectomy for Thymic Malignancies: Systematic Review and Meta-Analysis. *J Thorac Oncol* 2016;11:30-8.
3. Qian L, Chen X, Huang J, et al. A comparison of three approaches for the treatment of early-stage thymomas: robot-assisted thoracic surgery, video-assisted thoracic surgery, and median sternotomy. *J Thorac Dis* 2017;9:1997-2005.
4. Agatsuma H, Yoshida K, Yoshino I, et al. Video-Assisted Thoracic Surgery Thymectomy Versus Sternotomy Thymectomy in Patients With Thymoma. *Ann Thorac Surg* 2017;104:1047-53.
5. Chao YK, Liu YH, Hsieh MJ, et al. Long-term outcomes after thoracoscopic resection of stage I and II thymoma: a propensity-matched study. *Ann Surg Oncol* 2015;22:1371-6.
6. Ye B, Tantai JC, Ge XX, et al. Surgical techniques for early-stage thymoma: video-assisted thoracoscopic thymectomy versus transsternal thymectomy. *J Thorac Cardiovasc Surg* 2014;147:1599-603.
7. Ye B, Li W, Ge XX, et al. Surgical treatment of early-stage thymomas: robot-assisted thoracoscopic surgery versus transsternal thymectomy. *Surg Endosc* 2014;28:122-6.
8. Weksler B, Tavares J, Newhook TE, et al. Robot-assisted thymectomy is superior to transsternal thymectomy. *Surg Endosc* 2012;26:261-6.
9. Burt BM, Yao X, Shrager J, et al. Determinants of

- Complete Resection of Thymoma by Minimally Invasive and Open Thymectomy: Analysis of an International Registry. *J Thorac Oncol* 2017;12:129-36.
10. Fang W, Yao X, Antonicelli A, et al. Comparison of surgical approach and extent of resection for Masaoka-Koga Stage I and II thymic tumours in Europe, North America and Asia: an International Thymic Malignancy Interest Group retrospective database analysis. *Eur J Cardiothorac Surg* 2017;52:26-32.
11. Toker A, Sonett J, Zielinski M, et al. Standard terms, definitions, and policies for minimally invasive resection of thymoma. *J Thorac Oncol* 2011;6:S1739-42.
10. Fang W, Yao X, Antonicelli A, et al. Comparison of surgical approach and extent of resection for Masaoka-Koga Stage I and II thymic tumours in Europe, North America and Asia: an International Thymic Malignancy

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