

Wind of change in surgical treatment of thymic tumors

Marco Anile, Camilla Poggi, Daniele Diso, Ylenia Pecoraro, Erino A. Rendina, Federico Venuta

Department of Thoracic Surgery, University of Rome Sapienza, Roma, Italy

Correspondence to: Federico Venuta, MD. Department of Thoracic Surgery, University of Rome Sapienza, Roma, Italy.

Email: federico.venuta@uniroma1.it.

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Thymic tumors are a rare entity with a peculiar behavior ranging from indolent neoplasms to aggressive cancers (1). Complete surgical resection is advocated as the gold standard when feasible (2); chemotherapy and radiotherapy can be administered as an induction at advanced stages unsuitable for complete resection (3) or as adjuvant treatment in case of advanced pathological stages, aggressive histologies (3,4) or R+ resection. For a long time, because of the median position of the thymus within the mediastinum, the resection of thymic tumors has been almost always performed through a median access (complete sternotomy, sternal split, cervicotomy) and, in exceptional cases, by clamshell or combined incisions. Thymectomy included complete removal of thymus and the perithymic tissue. During the last ten years, due technological improvements, new trends in surgical management of thymic tumors have been proposed; particularly, the impressive impulse towards minimally invasive surgery is worldwide changing the historical dogmas concerning thymic surgery.

As reported in the exhaustive review by the group of Enrico Ruffini (5) several aspects about surgical management are now challenging and changing our historical view. They identified four key points currently under debate: (I) the role of minimally invasive surgery, (II) the role of lymph node dissection, (III) the extension of resection in case of non-myasthenic thymoma and (IV) the management of locally-advanced thymic tumors with pleural involvement. Although all these issues deserve critical discussion and analysis, two of them (role of lymph node dissection and extension of resection) require

further comments. In fact, up to now the role and limits of minimally invasive surgery is clear enough in all fields of thoracic surgery as well as the management of borderline cases as patients with locally advanced tumors. On the other hand, the usefulness of lymph node staging for thymic tumors and the possibility to perform partial thymectomy are new concepts that has not yet validated and accepted.

The Masaoka-Koga staging system has been one of the cornerstones in the management of thymic tumors (6). The strong efforts of the International Thymic Malignancies Interest Group (ITMIG) in collaboration with other international societies produced a new staging system as part of the 8th TNM edition (7,8) with huge differences compared to the previous classification concerning lymph node dissection; particularly, surgeons might identify, sample or remove anterior perithymic lymph nodes (N1) and deep intrathoracic or cervical stations (N2). The review reports single center retrospective experiences (9) and retrospective studies with data extrapolated from large national database (10) that have been useful to rewrite the staging system. In all of them it is clearly shown that N+ is an independent prognostic factor affecting prognosis; this variable is strongly associated with the diameter of the tumor and aggressive histologies. In fact, as part of their review the authors report the ESMO guidelines, suggesting lymphadenectomy for thymomas invading neighboring structures, thymic carcinoma or NETT. The question is: how does management of these patients change after lymph node dissection? We all know that in lung cancer patients the presence of N+ disease encourages

administration of adjuvant therapy independently from histology or T status. For thymic tumors it looks like this is not the case since patients with invasive tumors or more aggressive histologies already receive adjuvant therapy. Thus, we probably need more specific and prospective data to validate this procedure, also considering that lymph node dissection dilates operative time and can negatively affect the postoperative course.

The second point is related to the best surgical treatment for non-myasthenic thymoma patients. Historically, based on oncological reasons, thymectomy consisted in the en-bloc removal of thymic tumor and thymic gland; recently, a new approach has been proposed called “thymomectomy” or limited thymectomy, performing only the resection of thymoma sometimes associated with removal of part of the thymus. The promoters of this “philosophy” particularly suitable for thoracoscopic resections consider this procedure oncologically adequate at early stages (11,12); in these reports it is underlined that in patients treated by total thymectomy or thymomectomy the disease-free survival and the rate of new onset of myasthenia gravis are similar. Furthermore, some authors postulate that the preservation of thymus could be useful in the remaining life as immunologic help in case of future diseases (13). However, there are some critical points: first of all, the possibility of a potentially incomplete resection in case of limited thymectomy is higher, particularly at stage II, as shown in a study from the Chinese Alliance for Research in Thymoma (2.9% *vs.* 14.5%) (14). Furthermore, it has been well described that also at early stages thymoma could present multiple nodules in the remaining gland (15) or show different histologies (also more aggressive) in a single nodule (16) that could negatively affect prognosis due to an increased recurrence rate. In addition, follow-up of these patients must obviously be longer and, once again, we need prospective studies. Finally, we would like to remark a little but substantial “mistake” in the review paper that could generate misunderstanding: the authors report that a multicenter study from the Korean Association for Research on Thymoma showed a lower incidence of postoperative complications after limited thymectomy when compared to complete thymectomy. This is not true. In the original paper (12) it is clearly written in the text and reported in a table that postoperative complications are similar (not statistically different): 5% for limited thymectomy and 3.5% for complete thymectomy.

In conclusion, we are living an exceptional wind of change in the surgical treatment of thymic tumors; however,

we must always follow basic surgical principles and oncological rules to avoid misunderstanding with potential negative consequences for our patients.

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Footnote

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