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EDITORIAL

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Surgery of the thymus in 2015: more quality from the available data

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The interest for the surgical management of thymic conditions has never been so strong. The concomitant publication in the same issue of the *EJCTS* of two original articles, one Editorial Comment and one Review that address several aspects of our surgical practice, reflects the need for better knowledge [1–4]. In fact, the abundance of reports in the literature on surgery on the thymus gland should not mislead the reader because, despite the formidable efforts taken in the last years by several organizations to standardize the surgical approach for thymic diseases, too many issues are still unresolved. This uncertainty is reflected in the current literature, despite the analysis by multicentric reports or societal databases [5–7]. These databases are commonly used to investigate the biological aggressiveness of the rare thymic tumours and their prognostic correlates [8]. At the same time, some other important, albeit basic, aspects of the surgical treatment of thymic conditions are being neglected. As a consequence, a large amount of data on these rare tumours are needed now more than ever before to challenge and possibly replace the fragile evidence resulting from the small number of institutional series.

THYMECTOMY AND THYMOMECTOMY

The dichotomy between thymectomy and thymomectomy is one example; the former is used to describe the complete removal of the thymus of patients with myasthenia gravis (MG), whereas the latter refers to the resection of a tumour within the thymus gland. We take this distinction for granted, although there is, in principle, no reason not to apply the same resection criteria of thymectomy to thymomectomy. Indeed, recent evidence supports the concept that, when thymoma is not associated to MG, the complete removal of the thymus gland may not always be warranted for early-stage tumours [9]. In a recently published paper addressing the issue of adding thymectomy to thymomectomy in non-myasthenic patients, 95 patients were divided in two groups according to the surgical approach. Interestingly, the 'extended' (i.e. thymectomy and thymomectomy) procedure was performed via sternotomy, whereas the thymectomy only procedure was done by video-assisted thoracic surgery (VATS) or thoracotomy [9]. Neither differences in the onset of postoperative MG nor those in thymoma recurrence rates were observed in the two groups; however, the postoperative morbidity rates were lower in the thymomectomy only subset of patients [9]. In the same setting, another recent study on 173 patients evaluating thymothymectomy compared with thymomectomy again demonstrated no difference in the prognosis and the recurrence rates between the two groups [10]. Nevertheless, the authors themselves and others conclude that thymectomy may not always be indicated when thymomectomy is performed in non-myasthenic stage I and II patients [10, 11]. To further stir troubled waters, Yamada *et al.* have reported on the incidence of postthymectomy MG in 123 patients without MG before surgery (10 patients, 8%). In their series, the authors elected to perform an 'extended' thymectomy (i.e. thymomectomy and thymectomy) usually through sternotomy albeit VATS was used provided that the same extent of resection could be warranted [12]. Seropositivity for acetylcholine receptor antibodies, the more aggressive B thymoma histotypes and incomplete resections were found to be prognosticators for the onset of MG in the postoperative period [12].

THE SIZE OF THE THYMOMA

In deciding the surgical approach to the thymoma, does the size of the tumour matter? Recent evidence seems to support the need to include thymoma size in the staging system as a valuable predictor of relapse [13]. In the future, we may possibly have definitive data on the stratification of the type of approach according to the size of the tumour. One direct consequence on patient care would be a more precise informed consent to surgery instead of uncritically starting the thymoma patient on a minimally invasive operation which eventually turns into a predictable sternotomy. In this setting, we should start taking into account the conversion rates of VATS and robotic resections to sternotomy as a measure of quality of our surgical practice in the same way we do with VATS and robotic pulmonary resections. Nevertheless, technology is coming once again to the rescue of surgeons by making new resources available by which the clinical and morphological features of thymomas need to be assessed in order to avoid unnecessary thymectomies [14, 15].

BEYOND MASAOKA—AGAIN (?)

In spite of repeated attempts at overcoming a time-honoured classification with such stringent prognostic correlates, the usefulness of the Masaoka staging system has been confirmed in modern literature even though some adjustments are being suggested [16]. In particular, Guerrera *et al.* have reported in the paper published in this issue of *EJCTS* their results from a sizeable multicentric study on 750 thymomectomy patients, examining the hypothesis on the prognostic value of the WHO histological classification [3]. Although the WHO histotypes did not come out as significant prognosticators, the authors noted similar survival rates associated to stages I and II of the Masaoka classification [3]. This finding has led the authors to propose the assimilation of stages I and II into one early stage with a distinct prognostic outlook [3].

THE SURGICAL APPROACH TO MYASTHENIA GRAVIS

In spite of Class III evidence emerging from retrospective studies conducted according to rigorous statistical methodology (i.e. propensity score matching, [17]), the intrinsic value of thymectomy for MG in non-thymomatous patients has been questioned due to the lack of evidence resulting from randomized trials [18, 19]. Marulli and Rea, in their Editorial Comment appearing in this issue of *EJCTS*, analyse the uncertainties still associated to thymectomy in terms of the risk/benefit ratio and the impact on symptom relief, but emphasize the often forgotten evidence of a thymectomy-induced reduction of the requirements for MG medical treatment [4]. The same confusion reigns unchallenged when the choice of the minimally invasive approach to thymectomy for MG is contemplated. Keijzers *et al.* in their paper published in this issue of *EJCTS*, attempt to confirm the value of robotic-assisted thymectomy for MG [2]. From a strictly surgical standpoint, the 'no touch' dissection and the geographic contours of the exeresis are emphasized as essential elements of the technique—tenets which should represent a quality feature of thymectomy irrespective of the surgical approach [2]. According to the conclusions of a best evidence paper published in the Interactive CardioVascular and Thoracic Surgery aimed at evaluating the studies comparing sternotomy and VATS thymectomy for MG and showing substantial clinical equipoise between the two approaches in terms of disease resolution, VATS should be preferred due to its improved cosmesis and the reduced need for medications despite longer operative times [20]. However, in the absence of a conclusive evidence of a true superiority of one technique over the other, several different factors interplay in the decision-making process for the preferred surgical approach. As an example, the availability of robotic technology and the financial resources to support its continued use are particularly important in our modern, cost-conscious health systems. Another controversial issue is the identification of the subset of patients likely to benefit from the combination of thymectomy and prolonged medical treatment due to the lack of consensus among neurologists with regard to standardized postoperative protocols [4]. Mao *et al.*, with their meta-analysis published in this issue of *EJCTS*, have contributed to the clarification of this aspect, emphasizing that patients with Osserman 1 and 2a or MGFA I-II are associated with the highest MG remission rates after thymectomy [1].

In conclusion, there are two 'leitmotifs' that seemingly may help in overcoming the impasse that characterizes surgery of the thymus in 2015. One regards the need for large data analysis in order to standardize surgical and non-surgical management of thymic conditions. In turn, standards should be used to inspire an individualized surgical approach to patients with thymoma and/or without MG in terms of quality, cost-effectiveness, extent of resection and postoperative care.

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