Editorial

Thymic tumors: a never-ending story

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Thymic tumors are relatively rare and show a peculiar behavior ranging from an indolent attitude for A or AB histologic subtypes to more aggressive cancers in case of B3 lesions or thymic carcinoma (type C). Historically, the two main variables influencing outcome are staging (according to the Masaoka-Koga system and, more recently, the revised TNM), and histology (WHO classification) (1-3). Treatment includes multimodality strategies (4) (surgery alone or in combination with induction or adjuvant chemo or radiotherapy) and it is always planned according to these two prognostic factors in order to achieve complete resection, long-term survival, and avoid local and distant recurrence.

Surgery certainly represents the gold standard; the best strategy is the one that allows complete resection by removal of the thymus and the perithymic tissue through a median approach (sternotomy, sternal split, cervicotomy and even the clam-shell incision) (5,6). Recently, several reports supported minimally invasive approaches; thymomectomy (removal of the thymoma only), particularly at early stages and in patients without myasthenia, allows promising results in terms of oncological outcome and a reduced impact on quality of life (7,8).

The paper by Tseng *et al.* (9) on their 16-year experience with "thymoma and thymic carcinoma" is intended to add strength to this strategy, with the old idea that recurrence might be considered as the best variable to assess oncological outcome. The purpose of this study is interesting and intriguing, and could bring us new scenarios; however, besides the study limitations already reported by the authors, (single institution experience, relatively short follow-up, no multivariate analysis…), other and more serious criticisms risk to compromise the conclusions.

First of all, the title of the paper is misleading, inappropriate and incorrect: it gives the idea that the study population includes both thymoma and thymic carcinoma, but this is not the case. In the last version of the WHO classification "thymoma" includes types A, AB and Bs; thymic carcinoma is a separate entity defined as type C. Unfortunately, no patient included in this study had thymic carcinoma! Due to the critical differences in the biology and clinical behavior of these two entities (thymoma and thymic carcinoma) (10-12), it could be more appropriate to consider them separately (this is currently the trend in the literature); thus, the word "thymic carcinoma" should have been deleted from the title, if not by the authors at least by the reviewers, even if the series includes 41 B3 patients.

The main endpoint of this study is to demonstrate that recurrence is the best indicator of oncological outcome. Due to the indolent behavior of these tumors also after treatment of recurrences (13), this hypothesis can be reasonable: in fact, long-term survival is achievable even after one or more recurrences. In this series of 235 patients, 25 recurrences were reported; however, the incidence is probably overestimated since R0 resections were 228 only, with 7 R+. It could be not useful to include in the recurrence group also patients receiving incomplete resection. Furthermore, there are 32 patients at stage III-IVA/B; 15 of them developed recurrence and 9 were at stage IV. No specific data were reported on the type of treatment at these advanced stages. We can imagine that all of them received some form of adjuvant treatment; however, more information is required to avoid misunderstanding. This is important since one of the considerations drawn

by the authors is that if 60% of all recurrences occurred at advanced stages, including already metastatic patients (11 patients were at stage IV), a multimodality strategy involving induction treatment, as extensively reported in literature, could be considered, with a potential decrease of the R+ rate.

The last point in discussion is the "diatribe" concerning the surgical approach and type of resection, a sort of new rivalry as Guelphs and Ghibellines between minimally invasive versus open thymectomy and thymomectomy versus complete thymectomy. Recently, most of the literature focused on the demonstration that minimally invasive surgery (MIS) is technically feasible, safe and efficient, and it also allows similar oncological results when compared to an open approach. MIS shows clear advantages due to its low invasiveness, with a reduction of pain, a better functional recovery and a decrease of length of hospitalization; however, with the exception of rare experiences with extended resections performed in MIS, this approach is clearly deserved to early stages; an open approach is still the gold standard when facing locally aggressive tumors. Thus, the comparison stressed in the univariate analysis of this paper between these two "philosophies" is inappropriate: it compares two different groups of patients, like apples with pears. To clearly define the real oncological benefit of MIS or whatever surgical strategy, similar stages and histologies should be compared, with a standardized surgical approach.

The optimal treatment for thymic tumors at any stage still remains controversial. However, although retrospective studies are still useful, especially if they include large and homogeneous groups of patients, it could be better to converge towards international registries as those proposed by ESTS (14,15) or ITMIG (16).

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Footnote

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