Extended Abstract

Is total thymectomy always necessary for early-stage thymic epithelial tumors?- extended abstract

Fenghao Yu, Xiuxiu Hao, Xuefei Zhang, Yu Yang, Zhitao Gu, Teng Mao, Wentao Fang

Department of Thoracic Surgery, Shanghai Chest Hospital, Shanghai Jiao Tong University, Shanghai, China

Correspondence to: Wentao Fang. Department of Thoracic Surgery, Shanghai Chest Hospital, Shanghai Jiao Tong University, No. 241, West Huaihai Road, Shanghai, China. Email: vwtfang@hotmail.com.

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Surgery remains the standard of care and provides the best chance of cure for early-stage, namely UICC/IASLC/ITMIG stage I, thymic epithelial tumors (TET) (1). Besides tumor stage and histology, complete resection is considered as the most important prognostic factor (2). Total thymectomy, including resection of the tumor together with the entire thymus gland, has long been the standard procedure for TETs (1). This helps to reduce the probability of recurrence and to prevent the potential risk of *de novo* myasthenia gravis (3). It is a straightforward procedure via median sternotomy, but could be challenging in the minimally invasive setting. Dissection of the contralateral lobe via a lateral approach during a minimally invasive thymectomy carries more risk of bleeding from inadvertent injury to the left innominate vein, potential injury to the bilateral phrenic nerves, and often the need to go into the contralateral pleural cavity.

With the increased use of CT screening for lung cancers, more small thymic tumors in asymptomatic patients have been detected (4). Together with the rising interest in minimally invasive thymectomy, there has been a voice of using partial thymectomy for such early stage lesions in recent years. Similar overall survivals and recurrence rates between total thymectomy and limited resections (thymomectomy or partial thymectomy) have been reported (5,6). But they suffered the weaknesses of small number of cases and limited length of follow-up. Among 1430 Masaoka-Koga stage I and II (corresponding to UICC/IASLC/ITMIG stage I) nonmyasthenia patients in the International Thymic Malignancy Interest Group retrospective database study, no statistically significant difference in survival was found between the total thymectomy and the partial thymectomy groups; however, there was a trend towards a higher cumulative incidence of recurrence in the latter group (7). Similarly, in the Chinese Alliance for Research in Thymomas database analysis, the 10-year recurrence-free survival in Masaoka stage II patients was significant lower in the partial thymectomy group than that in total thymectomy group. Since it is difficult to distinguish Masaoka stage II tumors from stage I diseases either before or during surgery, a clear resection margin is thus crucial to achieve an optimal outcome in these patients.

While limited resections have been increasingly used for indolent ground glass opacity-containing early stage lung cancers, it is necessary to reevaluate the role of a lesser extent resection for small, early stage TETs. However, partial thymectomy is an ill-defined concept. It ranges from a subtotal thymectomy, to mere resection of the tumor per se along with its surrounding fatty tissue (similar to a wedge resection of early stage lung cancers), to even an enucleation of the tumor only. Anatomically, the thymus gland is a butterfly shaped organ with a thin fibrous septum between the two lobes. In a sense, an anatomical hemi-thymectomy would be similar to a lobectomy in lung cancer surgery. Compared with minimally invasive total thymectomy, a minimally invasive hemi-thymectomy decreases the risk of bleeding from dissecting the contralateral upper pole and the risk of contralateral phrenic nerve injury. As a technically easier and safer procedure, operation time could be shortened, and there might be potential benefits in young patients whose thymus is still in function. It is thus worthy of exploring if its oncological outcomes are non-inferior to a total thymectomy in selected patients in terms of R0 resection and long-term outcomes.

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