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Commentary: Extrapleural pneumonectomy during myasthenic crisis: The urge to go big or go home

Abbas E. Abbas, MD, MS, FACS

Abbas El-Sayed Abbas, MD, MS, FACS

CENTRAL MESSAGE

Extended resections such as extrapleural pneumonectomy for thymoma are justified only in operable patients with extensive pleural dissemination and strong expectation of complete eradication of the tumor.

Myasthenia gravis (MG) is an uncommon autoimmune disease related to the thymus gland that may exist both separately and in conjunction with thymoma. MG affects 30% to 50% of patients with thymoma,[1] and thymoma is found in 10% to 30% of patients with MG.[2] This crippling autoimmune disease usually runs a protracted progressive course. However, 10% to 20% of MG patients will develop myasthenic crises (MC), associated with respiratory failure and necessitating mechanical ventilation.[3]

Like MG, thymoma is also both rare and peculiar. Its biological behavior ranges from benign to extremely malignant, often invading local mediastinal structures, such as the innominate vein, phrenic nerve, pulmonary hilum, heart, aorta, and airways. Thymomas can also disseminate by "drop metastasis" to the pleural surfaces, much like ovarian cancer in the peritoneal cavity. Despite this, thymomas have a relatively slower progression and better prognosis than other similarly aggressive tumors. Surgical resection remains the mainstay of treatment and cure, although experienced thoracic surgeons will agree that the procedural difficulty can range from simple to challenging. This becomes important since it is well established that the most important factor affecting long-term prognosis apart from World Health Organization histological classification and Masaoka stage is completeness of resection.[4-6] Therefore, surgeons must go to great lengths to achieve R0 resection. Luckily, these patients are often young and healthy and can generally tolerate heroically extensive resections when necessary.

Iqbal and colleagues[7] reported a case of extended thymectomy with extrapleural pneumonectomy (ETEPP) for recurrent thymoma invading the myocardium in a young woman with history of previous R1 resection. This patient also had respiratory failure from MC, refractory to both plasmapheresis and intravenous immunoglobulin, but, amazingly, she recovered after surgery. Although this may be the first report of ETEPP in a patient in the throes of MC, the operation has been described for pleurally disseminated thymoma (stage IVA) in several other studies.[8-11] Two studies compared ETEPP with lesser resections such as pleurectomy and reported superior outcomes after ETEPP (Table 1).[9,10]

Of course, even in young patients, ETEPP is not without significant risk. The postoperative effect of pneumonectomy in a myasthenic patient who has not yet achieved remission and is unable to physically rehabilitate may be devastating. In addition, the danger of contaminating the pneumonectomy space or the peritoneal cavity by tumor droplets may be a major risk in this indolent tumor.[8]

Far fewer studies have suggested any form of surgery, let alone ETEPP during MC.[12] In fact, thymectomy may

From the Division of Thoracic Surgery, Department of Thoracic Medicine and Surgery, Lewis Katz School of Medicine at Temple University, Philadelphia, Pa.

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Address for reprints: Abbas E. Abbas, MD, MS, FACS, Department of Thoracic Medicine and Surgery, Temple University Health System, Lewis Katz School of Medicine, 3401 N Broad St, Suite C-100, Philadelphia, PA 19035 (E-mail: abbas.abbas@temple.edu).

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TABLE 1. Studies of extrapleural pneumonectomy with and without pleurectomy for stage IVA thymoma

Study	Procedure	2-y survival, %	5-y survival, %	10-y survival, %	DFS, %
Wright, 2006[8]	5 ETEPP	NR	75	50	
Huang et al, 2007[9]	3 ETEPP	NR	100	100	100
	9 Pleurectomy				66
Ishikawa et al, 2009[10]	4 ETEPP	NR	75	75	
	7 Pleurectomy		16	0	
Yang et al, 2011[11]	7 ETEPP	100	NR	NR	

DFS, Disease-free survival; *ETEPP*, extended thymectomy with extrapleural pneumonectomy; *NR*, not reported.

cause postoperative MC in 12%–34% of patients.[13-15] Therefore, most authorities recommend thymectomy for nonthymomatous MG only as an elective procedure when symptoms are under control and steroids are at a minimum.[13,16]

These various reports of thymoma and MG surgery raise several important and controversial questions:

- How far should one go in resecting thymomas?
- Does debulking alone play a role?
- What is the role of surgery during MC?
- What is the role of neoadjuvant or adjuvant therapy?

Unfortunately, owing to the rarity of these tumors, the literature does not provide sufficient evidence to answer these questions. Most of the larger series span long time periods and include different histological classifications, therapies, and surgical techniques. This rarity also precludes the conduct of prospective trials. Multicenter organization registries, such as the International Thymic Malignancy Interest Group, are important to improving our understanding of this disease.

Many of the "rules" that we follow in treating advanced thymoma are based on our collective wisdom and experience. Perhaps the most crucial of these rules is the importance of achieving complete resection of the tumor whenever possible. Heroic resections are justified only after a careful evaluation of the specific tumor and patient characteristics. Such operations should be performed only in operable patients with extensive pleural dissemination and strong expectation of complete eradication of the tumor. Operating during MC on a ventilated patient may be associated with poor outcomes and cannot be considered routinely safe, especially when the planned resection is a reoperative ETEPP with myocardial resection. In such cases, it is sometimes better to not go big that day but to go home instead and wait to fight another day.

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