

## Whether Thymoma Patients in Myasthenia Crisis Could Benefit from Immediate Resection of Tumor Compared with Selective Surgery after Stabilization of MC

Jiaqi Zhang, MD, PhD, Lei Liu, MD, Guige Wang, MD, PhD, Wenliang Bai, MD, PhD, and Shanqing Li, MM

**Keywords:** myasthenia gravis, myasthenia crisis, thymectomy

We read with great interest the case report titled, “Thymectomy during Myasthenic Crisis under Artificial Respiration” from Takuya Onuki and colleagues.<sup>1)</sup> We encounter the same difficulty during our clinic works and would like to make some comments.

As many guidelines and studies<sup>2,3)</sup> suggest, if a patient diagnosed with myasthenia gravis (MG) has a thymoma, he/she would be advised to receive thymectomy when the symptoms of MG have been in remission, for which we worry about the induction of myasthenia crisis (MC) during or after operation, making the patient suffer from acute respiratory failure and some other fatal outcomes. However, if the patient has been in MC and received artificial ventilation, whether thymectomy really benefits him/her is unclear, and there is little relevant research published to date.

Intuitively, if the patient has been in MC and suffered from respiratory failure, thymectomy seems not to cause a worse outcome, and the sensibility of medicine therapy would rise under the condition that MC is associated with thymoma. Unfortunately, we lack the evidences. Whether our thymoma patients in MC could benefit from immediate resection of tumor compared with selective surgery after stabilization of MC, it is a puzzle. Current published papers could not afford these evidences. For

the reasons, we think the first one is that the incidence of MC in thymoma patients before surgery is rare. As Takuya Onuki cited in the paper, postoperative MC after thymectomy occurs at a low rate of 11.5%–18.2%, the occurrence of MC before surgery is lower; consequently, some guidelines have not mentioned that. The second reason we think is that we find it hard to evaluate the effects of treatment. Some indicators include the hours of postoperation artificial ventilation, the dosage, and course of medicine, the length and cost of hospital stay, recurrence of MG/MC, and so on. But preparation before operation of patients in MC is also related to postoperation outcome and is hard to define and evaluate. What is more, the drug sensibility is quite difficult to assess before and after surgery. Recently, Annals of the New York Academy of Sciences released a guideline<sup>4)</sup> suggesting that thymectomy should be considered in children with generalized AChR-antibody positive MG either if the response to pyridostigmine and immunosuppressive (IS) agent therapy is unsatisfactory or to avoid potential complications of IS therapy. Perhaps thymectomy could increase the sensibility of drug treatment. Above all, that is what puzzles us, and we would appreciate the answer and would like to do something for the question. Finally, we thank Takuya Onuki and colleagues providing the case report.

*Department of Thoracic Surgery, Peking Union Medical College Hospital, Chinese Academy of Medical Sciences and Peking Union Medical College, Beijing, China*

Received: July 12, 2018; Accepted: August 22, 2018

Corresponding author: Shanqing Li, MM. Department of Thoracic Surgery, Peking Union Medical College Hospital, Chinese Academy of Medical Sciences and Peking Union Medical College (East), No. 1 Shuaifuyuan, Dongcheng District, Beijing 100730, China  
Email: 13121971623@163.com

©2019 The Editorial Committee of *Annals of Thoracic and Cardiovascular Surgery*. This work is licensed under a Creative Commons Attribution-NonCommercial-NonDerivatives International License.

### Disclosure Statement

The authors have no conflicts of interest to declare regarding the content of this article.

### References

- 1) Onuki T, Ueda S, Otsu S, et al. Thymectomy during myasthenic crisis under artificial respiration. *Ann Thorac Cardiovasc Surg* 2018 Mar 7; doi: 10.5761/atcs.cr.17-00176. [Epub ahead of print]

- 2) Sanders DB, Wolfe GI, Benatar M, et al. International consensus guidance for management of myasthenia gravis: Executive summary. *Neurology* 2016; **87**: 419–25.
- 3) Spillane J, Hayward M, Hirsch NP, et al. Thymectomy: role in the treatment of myasthenia gravis. *J Neurol* 2013; **260**: 1798-801.
- 4) Sanders DB, Wolfe GI, Narayanaswami P, et al. Developing treatment guidelines for myasthenia gravis. *Ann NY Acad Sci* 2018; **1412**: 95–101.

## Reply to Zhang et al.

Takuya Onuki, MD, PhD

*Department of General Thoracic Surgery, Tsuchiura Kyodo General Hospital, Tsuchiura, Ibaraki, Japan*

Corresponding author: Takuya Onuki, MD, PhD. Department of General Thoracic Surgery, Tsuchiura Kyodo General Hospital, 4-1 Ohtsuno, Tsuchiura, Ibaraki 300-0028, Japan  
Email: onukitakuya@hotmail.com

We are privileged to have our report “Thymectomy during Myasthenic Crisis under Artificial Respiration” recognized by Dr. Zhang and colleagues.<sup>1)</sup>

Our case of thymoma with myasthenia gravis (MG) was not considered common, as myasthenic crisis (MC) occurs before extended total thymectomy, which will be referred to as “thymectomy” after this. In general, surgical procedure after the MC remission is performed for MC cases.<sup>2)</sup> It is likely that our report presenting thymectomy during MC is the first time it has been described in the literature.

In our case, the remarkable tumor reduction after pulse steroid therapy for MC was the most important factor which made us decide to perform thymectomy during MC. At first, this tumor was large and combined resection of the surrounding organs would have been required. Pulse steroid therapy improved MC and reduced the tumor size; thus, thymectomy could be easily performed. It was suspected that such a reduction must have been brought about by the histological subtype characterized by the World Health Organization (WHO) as type B1.<sup>3)</sup> Reduction through steroid therapy is temporary.<sup>4)</sup> It was thought that a thymectomy during MC was better than after MC remission, due to tumor regrowth potentially causing the incomplete resection. However, if the tumor does not shrink after pulse steroid therapy, thymectomy during MC may provide little benefit. The histological subtypes that can present little tumor reduction are WHO types AB and B3.<sup>3)</sup> It would be safe to perform thymectomy after MC remission for cases with such poor tumor reduction. The sensitivity of thymomas to steroid therapy should be understood by the thoracic surgeon.

The discussion around the effect of thymectomy during MC for MC remission and medium- to long-term MG control might not be sufficient in our report. We intuitively thought that the MC symptoms would not be worsened by thymectomy during MC, but this was not based on clinical evidence. Our case needed about 2 weeks for artificial ventilation, which was scheduled by our neurologists. However, it is hard to evaluate whether our thymectomy affected MC or not, as indicated by Dr. Zhang. Only a few previous reports explain the medium- to the long-term effect of thymectomy on MG. Thymectomy with video-assisted thoracoscopic surgery (VATS) for MG cases has not yet been performed in our institute. Recently, some reports presenting this procedure for MG were published; meta-analyses showing that there were no differences between thymectomy performed through VATS and median sternotomy with respect to long-term MG control.<sup>5,6)</sup> Therefore, as a surgical procedure of thymectomy during MC, VATS may also have little benefit comparable to that of median sternotomy on medium- to long-term MG control. On the other hand, the fact that VATS can help avoid sternal osteomyelitis caused by median sternotomy is a unique benefit to VATS, as almost all MC cases become immune suppressive as a result of steroids or immunosuppressant drugs.

Recently, few studies have discussed thymectomy during MC; however, additional studies on the subject are required to further discuss the advantages and disadvantages associated with thymectomy during MC.

## References

- 1) Onuki T, Ueda S, Otsu S, et al. Thymectomy during myasthenic crisis under artificial respiration. *Ann Thorac Cardiovasc Surg* 2018 Mar 7; doi: 10.5761/atcs.cr.17-00176. [Epub ahead of print]
- 2) Sanders DB, Wolfe GI, Benatar M, et al. International consensus guidance for management of myasthenia gravis: executive summary. *Neurology* 2016; **87**: 419-25.
- 3) Kobayashi Y, Fujii Y, Yano M, et al. Preoperative steroid pulse therapy for invasive thymoma: clinical experience and mechanism of action. *Cancer* 2006; **106**: 1901-7.
- 4) Yano M, Sasaki H, Yukiue H, et al. Thymoma with dissemination: efficacy of macroscopic total resection of disseminated nodules. *World J Surg* 2009; **33**: 1425-31.
- 5) Qi K, Wang B, Wang B, et al. Video-assisted thoracoscopic surgery thymectomy versus open thymectomy in patients with myasthenia gravis: a meta-analysis. *Acta Chir Belg* 2016; **116**: 282-8.
- 6) Gung Y, Zhang H, Li S, et al. Sternotomy versus video-assisted thoracoscopic surgery for thymectomy of myasthenia gravis patients: a meta-analysis. *Asian J Endosc Surg* 2016; **9**: 285-94.