Non-small-cell Lung Cancer Associated with Non-thymomatous Myasthenia Gravis

A non-small-cell lung cancer without distant metastases was incidentally found in a 77-year-old man who had suffered from myasthenia gravis (MG) without thymoma. The patient’s condition was stabilized by oral pyridostigmine bromide which he had taken during the past 6 years. He simultaneously underwent thymectomy and left lower lobectomy with regional lymph node dissection. Although postoperative myasthenic crisis occurred, mechanical ventilation and intravenous steroid pulse relieved the patient and the symptoms improved thereafter. Cases of operable lung cancer with non-thymomatous MG have rarely been reported and the appropriate therapeutic strategy for such cases remains to be debated. Their causal association remains to be identified, whereas some studies have implied that immune disorder due to the abnormal thymus might possibly enhance the oncogenesis of extrathymic malignancies. Myasthenic crisis should also be taken into account in postoperative management of MG patients who simultaneously undergo thymectomy and lobectomy for synchronous lung cancer.

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Thymectomy for myasthenia gravis (MG) is permissible when performed simultaneously with radical surgery for a synchronous extrathymic thoracic malignancy in a stable situation. The current report describes a simultaneous operation of thymectomy and pulmonary lobectomy that was performed on a non-thymomatous MG patient who had been treated with anticholinesterase medication for more than 6 years before presentation with a non-small-cell lung cancer.

Case

A solitary mass lesion on a chest X-ray was incidentally found in the left lung field of a 77-year-old man who had been treated for MG without thymoma during the past 6 years. Further investigations including computed tomography (CT) (Fig. 1), transbronchial biopsy, and metastatic workup confirmed that the pulmonary lesion was a non-small-cell lung cancer at clinical stage IB (T2N0M0) arising in the apex of the left lower lobe, which indicated surgical treatments both for lung cancer and MG.

Diagnosis of MG had been established in our case based on the physical findings, electromyographic findings, and the elevated titers of pathogenic antibodies. At presentation with the lung cancer, the patient had suffered from symptoms including bulbar palsy (i.e., Osserman IIB) and had continued on daily anticho-
The patient required intubation on POD 4 and was extubated on POD 9. High-dose steroid was administered intravenously on POD 7, 8, and 9.

WBC, Leukocyte count of peripheral blood; CRP, serum C-reacting protein; AchR-ab, serum anti-acetylcholine receptor antibodies; PB, pyridostigmine bromide.

linesterase medication (pyridostigmine bromide; 240 mg/day) which had been well tolerated and stabilized the condition. The serum level of anti-acetylcholine receptor antibodies was 22 nmole/ml shortly after onset of MG, while it had been maintained at 11–13 nmole/ml during the last 2 years preoperatively.

The patient underwent thymectomy concomitant with radical surgery for lung cancer 75 months after onset of MG. Through a median sternotomy, extended thymectomy and subsequent left lower lobectomy with regional lymph node dissection (ND2a) were performed. Interlobar adhesion mimicking the tumor invasion required partial resection of the upper lobe (lower dorsal portion of $1^+$). The tumor was not adhesive to the aorta or the parietal pleura, and thoracoscope provided a clear view for a port-access maneuver in dividing the inferior pulmonary vein, which dispensed with making an intercostal thoracotomy. No muscle relaxants were administered during the anesthesia. The patient was transported to the intensive care unit in good condition after operation.

The postoperative course is illustrated in Figure 2. The patient was extubated the day after operation and oral pyridostigmine bromide was resumed on postoperative day (POD) 2, with the dose reduced to 120 mg per day. The patient’s strength had remained sufficient to sustain breathing without dyspnea until POD 4 when he became narcotic with severe hypercapnia (83 mmHg of arterial carbon dioxide). This event seemed due to respiratory failure caused by myasthenic crisis, while symptoms suggestive of cholinergic crisis such as saliva or cramp were not observed. No signs of infection were detected postoperatively.

Although mechanical ventilation was required for 5 days, with high-dose methylprednisolone (1,000 mg/day for 3 days) administered intravenously while intubated, the patient made an excellent recovery and was extubated again on POD 9 (Fig. 2). The myasthenic symptoms subsequently improved and he was restarted on pyridostigmine bromide, 180 mg/day, from POD 12 (Fig. 2). There was no dyspnea observed thereafter during the postoperative period. The serum level of anti-acetylcholine receptor antibodies was decreased to 4.2 nmole/ml on POD 22 (Fig. 2).

Postoperative pathological examination excluded lymph node metastases of lung cancer and thymic tumor. The lung tumor had a solid cut surface measuring 47x43 mm (Fig. 3A) and was histologically diagnosed as a moderately differentiated squamous cell carcinoma (Fig. 3B) without infiltration beyond the interlobar pleura (pathological stage IB). The resected thymus revealed sparse normal thymic tissue, with its diffuse replacement with adipose tissue (Fig. 3C). The patient’s strength has remained almost normal in the 8 months after discharge, while he has continued on 180 mg/day of pyridostigmine bromide.