Case Report

Integrative Pulmonary Medicine

A Rare Presentation of Thymoma with Myasthenia Gravis in an off Pump Coronary Artery Bypass Grafting Surgery

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Abstract

The role of thymus in the pathogenesis of myasthenia gravis is not entirely clear, but most patients with myasthenia gravis are found to have some degree of thymus abnormality. The thymus is hypothesized to be the site of autoantibody formation and therefore thymectomy has been proposed as a first line therapy. This is especially true if a thymoma is present, as thymectomy has been reported to significantly improve the clinical condition. Here we report a case of off pump coronary artery bypass grafting surgery who underwent thymectomy at the same sitting.

Case Report

A forty five year old male, known case of Myasthenia Gravis (MG) under treatment for two years presented with exertional angina and was diagnosed as Coronary Artery Disease (CAD) requiring Coronary Artery Bypass Grafting (CABG) surgery. Initially he was in MGFA (Myasthenia Gravis Foundation of America) class 2a with ptosis, diplopia with progressive weakness towards the evening and had a high titre of Acetyl Choline Receptor Antibodies (ACRA) and was treated with steroids and azathioprine and became symptomatically better. Further evaluation of the exertional angina with a coronary angiogram revealed tight occlusions of the Left Anterior Descending (LAD) artery, Obtuse Marginal (OM) artery and Posterior Descending Artery (PDA). Repeat ACRA levels came down to baseline. Hence it was decide to do thymectomy and CABG at the same sitting. He was taken up for off pump CABG (without the use of cardio pulmonary bypass). Through a midline sternotomy, thymus was dissected along with the surrounding pad of fat and excised with surrounding pleura and pericardium and sent for biopsy and immuno histochemistry. Total thymectomy was done freeing the thyro thymic ligaments superiorly along with the superior horns of the thymus and inferiorly up to the diaphragmatic attachment along with the inferior horns.

There was no obvious infiltration into the surrounding tissues. The conduits used for revascularization were the Left Internal Mammary Artery (LIMA) and Saphenous Vein Graft (SVG) which were harvested after systemic heparinisation. The LIMA was granted to the Left Anterior Descending (LAD) artery and the SVGs were grafted to the Obtuse Marginal (OM) and Posterior Descending Artery (PDA) with the help of stabiliser and blower. Heparin was reversed with protamine and the rest of the surgery went as planned and the patient had an uneventful post-operative course.

The histopathology report showed thymus tissue with lymphoid hyperplasia with focal calcification and prominent germinal center and Hassall's corpuscles (Figure 1).
Figure 1: Prominent germinal center and hassall's corpuscles in thymus tissue (40 X).

Immune histochemistry markers were positive for CD45, CD3 (Figure2).

Figure 2: CD3 - Positive in lymphoid component (immunohistochemistry).

Pan Cytokeratin which revealed lymphoid component and spindle cell component. Mitotic activity was not seen with any evidence of infiltration into the adjacent connective tissue. It was diagnosed as mixed pattern type B1 sclerosing variant Thymoma in masoaka stage 1 (Figure 3).

Figure 3: Thymus tissue- circumscribed lesion comprised of lymphocytes in myasthenia gravis (100 X).

Discussion

MG and CAD have been associated for many years but specific etiological link between the two entities does not exist. Most of the existing data is in the form of case reports and case series [1]. Although thymectomy and CABG are very common procedures but a combination of these two in a myasthenia gravis patient is very rare in our setting. No special surgical technique is required to perform these procedures simultaneously as both thymectomy and CABG can be performed via median sternotomy [2]. Both the phrenic nerves should be taken care of while doing thymectomy as phrenic nerve palsy can result in diaphragm dysfunction which can compromise the respiratory reserve of the patient [3]. As far as possible it is better to do CABG without the use of cardiopulmonary bypass as it results in less heparinisation and less bleeding post operatively, as we did in our case. Very rarely, large thymoma adherent to the surrounding structures might prove quite difficult to resect and in these situations pre-operative chemotherapy and radiotherapy might shrink and help in de bulking the tumour and then can be taken up for surgery with a clean plane of cleavage [3]. Our patient was diabetic and on long-term corticosteroid therapy which made his chances of infection high. Therefore, great care had to be taken in the overall management to prevent myasthenia crisis and chances of infection. No relationship has been established between arteriosclerotic changes and myasthenia gravis. However, MG antibodies such as Anti Kv1.4 have been related to cause myocarditis and electrocardiogram changes [4]. Detection of such antibodies as markers may lead to better prognosis of myasthenia patients. In the literature the incidence of thymoma during CABG
ranges from 0.2-0.6%. Early stage thymoma (I and II) is best treated with removal of the entire specimen with surrounding mediastinal tissue with avoidance of phrenic nerve injury [5]. Margin negative surgical resection alone is the best treatment for both stages I and II thymoma. Most failures of thymoma treatment are due to pleural recurrence [5]. The surgical procedure should consist of total thymectomy with en bloc resection of tumour with adjacent involved pericardium and pleura. Involvement of the great vessels should not preclude the procedure of thymectomy. Thymectomy has been indicated for myasthenia gravis with or without thymoma. Success rates of thymectomy have been well documented in patients with MG. The present experience and results of previous study show that median sternotomy is a surgical method of choice for thymectomy with a low risk of complication like wound infection and osteomyelitis. Corticosteroids are widely used as a therapeutic measure for MG. Previous studies have shown that pre-operative use of steroids in such patients undergoing thymectomy is beneficial [5]. The prognosis for patients with thymoma is definitely related to the type of resection, and many studies have been conducted regarding it. Although uncommon, MG represents an invalidating disease which has to be diagnosed as soon as possible in order to initiate the appropriate therapy thereby increasing the remission rate [6]. The clinical evaluation should be more accurate in patients with cardiac disease as initial MG symptoms could be masked resulting in an underestimated or incorrect diagnosis.

More recently, the results of maximal and complete thymectomies have been discussed in the literature, with some authors claiming that tumour recurrence can be prevented by maximal thymectomies [6]. With regard to the histological types, malignant thymoma have predominantly high mortality rates along with low survival rates. The study by Maggi et al included 241 cases in which the histological type had no effect on the prognosis, except for those cases involving malignant thymoma. However, chemotherapy and or radiotherapy after surgical resection raises the survival rate. Although some reports have indicated that subtotal resection or radiotherapy alone may be highly curative, the most common accepted surgical approach currently being used is a complete thymectomy [6].

**Conclusion**

The rare association of thymomatous MG with CAD presents a unique feature as one needs to tackle both the problems for which surgery gives a good opportunity for the same. Addressing the CAD alone leads to the problem of recurrent myasthenic crises and addressing MG alone results in persistent exertional angina. This case goes to show that both the surgeries can be done simultaneously in a single setting offering good symptomatic benefit as well as long term survival with better quality of life.

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**Reference**


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