

# Post Angioplasty Coronary Artery Bypass Grafting in Patient with Myasthenia Gravis

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## ABSTRACT

A 62 years old patient developed myasthenia gravis 2 years after his percutaneous coronary intervention. He was advised thymectomy for myasthenia gravis. During his cardiological evaluation, he was incidentally diagnosed to have 3 vessel disease. Hence, a simultaneous surgical intervention was performed consisting of thymectomy and CABG via standard cardiopulmonary bypass through median sternotomy. Previous medical history of diabetes and corticosteroid therapy made the patient immunocompromised. Therefore, a careful overall therapeutic strategy was devised to prevent mediastinitis. After his thymectomy and coronary artery bypass grafting, he was extubated within 6 hours. Plasmapheresis was done one day before the surgery and on first postoperative day. His medications for myasthenia gravis (pyridostigmine and prednisolone) were not stopped before and after the surgery. Patient was discharged on 6th postoperative day without any complications. On his follow-up 6 weeks postoperatively, his condition was unremarkable.

**Key Words:** *Myasthenia gravis. Coronary vessel disease. Thymectomy. Coronary artery bypass graft.*

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## INTRODUCTION

Myasthenia gravis is a relatively uncommon disorder with prevalence rates going upto 20 per 100,000 in the US population.<sup>1</sup> Till date, there have been very few case reports in our region regarding the patients suffering from myasthenia gravis along with severe coronary artery blockage and being treated simultaneously.

In this case report, authors outline a case of myasthenia gravis with a history of percutaneous coronary intervention 6 years back that presented again with a severe coronary vessel disease. The patient was successfully treated through a coronary artery bypass surgery and thymectomy in the same setting.

## CASE REPORT

A 62 years old married male with a history of percutaneous coronary intervention in 2006 and diagnosis of myasthenia gravis (MG) in 2008 presented to us with shortness of breath and chest pain for the last 4 months. He had been taking Pyridostigmine and Prednisolone for myasthenia gravis. The myasthenia crisis initially involved the ocular and pharyngeal muscles and then progressed to generalized weakness. The patient had a clinical history of ptosis and skeletal muscle weakness. Myasthenia gravis was classified as Osserman IIB and Myasthenia Gravis Foundation of America class IIIA. His

past medical history revealed severe three vessel disease and left ventricular dysfunction for which he had drug-eluting stents placed in left anterior descending and left circumflex artery.

On presentation, he was well oriented with respect to time, place and person. However, he reported inability to walk more than 40 steps and to climb more than 12 stairs at a time. Associated with shortness of breath, he also complained of chest pain which was central in origin, dull in character, gradual in onset and ended on rest (New York Heart Association class II). The intensity was moderate and the pain radiated to the back. His central nervous system examination showed intact Glasgow Coma Scale of 15/15 but reduced plantar reflexes due to myasthenia gravis. All vital signs were normal. On general examination, the tongue was glossy and grey coated. On inspection, there were no visible scars of precordium and no additional murmurs were heard.

His transthoracic echocardiography showed severely hypokinetic left ventricular apex, interventricular septum and anterior wall. Remaining segments showed normal contractility. Echocardiography also showed high normal size left ventricle with mild to moderate left ventricle dysfunction. Ejection fraction was reduced to 40%. Right ventricle size and function were normal. There was no sign of intracardiac mass or clot. His chest Computed Tomography (CT) scan revealed no thymoma. Cardiac catheterization and angiography showed recurrence of severe three vessel disease and left ventricular dysfunction. His right coronary artery had a severe diffuse proximal lesion. The left circumflex artery showed severe ostial lesion with tubular bifurcation. His left coronary artery showed 60% distal tapering. A coronary artery bypass was indicated for his ischemic heart

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disease. To determine whether the patient was neurologically fit for CABG (coronary artery bypass graft) and thymectomy, neurological consultation was taken that advised a session of plasmapheresis before and after the surgery.

An incision was done through median sternotomy. Before cardiopulmonary bypass, the thymus along with all the fat was removed from one pleural edge to another and was sent for biopsy to rule out any carcinoma. During the bypass, the lowest hematocrit observed was 20%, perfusion flow was maintained at 2.5 L/min/m<sup>2</sup>, and mean arterial pressure was kept around 55 mmHg. Intermittent antegrade cold blood cardioplegia was given to protect the myocardium during aortic cross-clamping. Saphenous vein and left internal mammary artery were harvested for the bypass without any complication. Bypass time was 65 minutes and aortic cross clamp time was 50 minutes. Left internal mammary artery was grafted to left anterior descending artery and right coronary artery and obtuse marginal artery were grafted with reverse saphenous veins grafts.

Patient taken off bypass, hemostasis was secured and cannulas removed. Pleural mediastinal drain was placed and steel wire was used to close the sternum. The surgery was terminated with inotropic support because the blood pressure was low at the time of taking the patient off the bypass. Furthermore, vasodilator (in the form of very low dose of glyceryl trinitrate) was given to prevent the spasm of left internal mammary artery graft. Patient was extubated within 6 hours post surgery. He was shifted to a ward on the second postoperative day and was discharged from hospital on the 6th postoperative day without any respiratory, cardiac and surgical wound complications. Histopathology of the biopsied tissue showed several small anthracotic lymph nodes and no evidence of malignancy.

## DISCUSSION

Myasthenia gravis and coronary artery disease 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. There has been some amount of clinical dilemma in differentiating the two pathologies.<sup>2</sup> 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. 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.

There have been cases reported in which use of anticholinesterase in a myasthenia gravis patient has caused coronary artery vasospasm and angina leading to myocardial infarction.<sup>3</sup> Hence, clinicians should be careful regarding the harmful interaction between cardiac function and medications used for myasthenia gravis. No relationship has been established between arteriosclerotic changes and myasthenia gravis.<sup>2</sup> However, myasthenia gravis antibodies such as Anti Kv 1.4 have been related to cause myocarditis and electrocardiogram changes.<sup>4</sup> Detection of such antibodies as markers may lead to better prognosis of myasthenia patients.<sup>4</sup>

Few cases have been reported in which thymectomy and coronary bypass grafting was done in the same setting. The patient that we describe in this particular case had coronary angioplasty with stenting in 2006 after which he developed myasthenia gravis. Then in 2012, he came to the cardiac surgery department for a coronary artery bypass grafting due to severe three vessel disease and left ventricular dysfunction. To the best of our knowledge this is the first case to be reported in our setting.

Plasmapheresis sessions were performed one day before and on the first postoperative day only. Patient was not on regular sessions of therapeutic plasmapheresis. Plasma exchange is a therapeutic option for cases where an immune etiology is present.<sup>5</sup> It is reported that pre-operative plasma exchange reduces the number of days in an Intensive Care Unit, and makes the postoperative myasthenia gravis crisis less severe. Plasmapheresis has also been reported to reduce the deleterious effects of cardiopulmonary bypass and postoperative bleeding. However, recently immunoadsorption plasmapheresis has been preferred over plasma exchange because of the fact that essential components are lost in plasma exchange which requires plasma substitutes.<sup>5,6</sup>

Thymectomy has been indicated for myasthenia gravis with or without thymoma. Success rates of thymectomy have been well documented in patients with myasthenia gravis.<sup>7</sup> 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.<sup>7</sup>

Corticosteroids are widely used as a therapeutic measure for myasthenia gravis. Previous studies have shown that pre-operative use of steroids in myasthenia gravis patients undergoing thymectomy is beneficial.<sup>8</sup> Moreover, early extubation in CABG and multi-disciplinary approach in patients undergoing trans-sternal thymectomy have also shown good results.<sup>9</sup> It has been reported that advantages of early extubation include reduction in respiratory complications, improved cardiac function and decreased postoperative hospital stay.<sup>9</sup>

Myasthenia gravis patients with coronary vessel disease need careful workup and evaluation requiring a liaison of multidisciplinary teams. More work in reporting cases like these needs to be conducted for future references and guidelines.

### REFERENCES

1. Trouth AJ, Dabi A, Solieman N, Kurukumbi M, Kalyanam J. Myasthenia gravis: a review. *Autoimmune Dis* 2012; **2012**: 1155-65.
2. Owe JF, Gilhus NE. Myasthenia gravis and the heart. *ACNR* 2008; **8**:9-10.
3. Comerci G, Buffon A, Biondi-Zoccai GG, Ramazzotti V, Romagnoli E, Savino M, *et al.* Coronary vasospasm secondary to hypercholinergic crisis: an iatrogenic cause of acute myocardial infarction in myasthenia gravis. *Int J Cardiol* 2005; **103**:335-7.
4. Suzuki S, Utsugisawa K, Nagane Y, Suzuki N. Three types of striational antibodies in myasthenia gravis. *Autoimmune Dis* 2011; **2011**:1024-33.
5. Kaynar L, Altuntas F, Aydogdu I, Turgut B, Kocyigit I, Hacıoglu SK, *et al.* Therapeutic plasma exchange in patients with neurologic diseases: retrospective multicenter study. *Transfus Apheresis Sci* 2008; **38**:109-15.
6. Yeh JH, Chen WH, Huang KM, Chiu HC. Prethymectomy plasmapheresis in myasthenia gravis. *J Clin Apher* 2005; **20**: 217- 21.
7. Rzyman W, Skokowski J, Marjanski T, Walczak A, Szymanowska A, Bilinska M. Thymectomy in myasthenia gravis. *Pol Merkur Lekarski* 2005; **18**:41- 4.
8. Kataoka H, Furiya Y, Ueno S. Complete remission of generalized myasthenia gravis by corticosteroid treatment alone without thymectomy. *Case Rep Neurol* 2011; **3**:239-41.
9. Sato M, Suenaga E, Koga S, Matsuyama S, Kawasaki H, Maki F. Early tracheal extubation after on-pump coronary artery bypass grafting. *Ann Thorac Cardiovasc Surg* 2009;**15**:239-42.

