# THYMOMA WITH MYASTHENIA GRAVIS PRESENTING AS PLEURO-PERICARDIAL CYST.

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***ABSTRACT***
***We report a case of a 25-year old male with generalized fatigue, chest pain, exertional dysponea, diplopia and ptosis. The patient had been taking Pyridostigmine and Prednisolone for last three years. X-ray Chest showed a mass in right thoracic cavity. Transesophageal echocardiography (TEE) revealed a large cystic mass with well defined margins seen in front of the right atrium (7x7cm). Computerized tomography (CT) of chest showed a mass in the right anterior mediastinum. $FEV_1$ and PEFR showed mild obstructive pattern. Routine investigations were normal limits. The patient was admitted for excision of pericardial cyst. Biopsy of the mass showed thymoma. This is a rare case of a pleuro-.pericardial cyst presenting as a thymoma.***

Key Words: Mysthenia Gravis, pleuro-pericardial cyst, thymoma.

## INTRODUCTION

The common tumors and masses in the anterior compartment are of thymic, lymphatic, or germ cell origin of which thymic tumours are the commonest. Thymoma is the most common anterior mediastinal tumor in adults, accounting for almost 50% of the neoplasms occurring in this compartment[12-21] Anterior mediastinal cysts are most commonly pleura-pericardial, thymic, teratomatous or cystic hygromas[9]. Pleuro-pericardial cysts are benign mesothelial cysts[10]. Benign anterior mediastinal cysts of pleura-pericardial or thymic origin in the adult, are mostly asymptomatic unless they become secondarily infected which is unusual.[1,2,3]

The most common systemic manifestation associated with thymoma is myasthenia gravis. This occurs in 10-50% of patients with thymoma. Complete surgical resection is the most critical factor in long-term patient survival. Although surgical resection is the preferred treatment for thymoma, patients with clinically unresectable extrathoracic disease require radiation therapy, chemotherapy, or both. Co-existence of Thymoma, myasthenia gravis and pleuro-pericardial cyst is unusual.[22]

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## CASE REPORT

A 25-year old male presented in the out-patients with generalized fatigue for seven years that was partially relieved by bed rest, and chest pain, exertional dysponea, diplopia and ptosis for which he was taking Pyridostigmine and Prednisolone for last three years. X-ray Chest showed a mass in right thoracic cavity (fig-1).

Transesophageal echocardiography (TEE) revealed a large cystic mass with well defined margins seen in front of right atrium (7x7cm). Computerized tomography (CT) of chest showed right anterior mediastinal mass (fig-2). $FEV_1$ and PEFR showed mild obstructive pattern. Routine investigations including haematology, thyroid function tests, muscle enzymes and ECG were within normal limits.

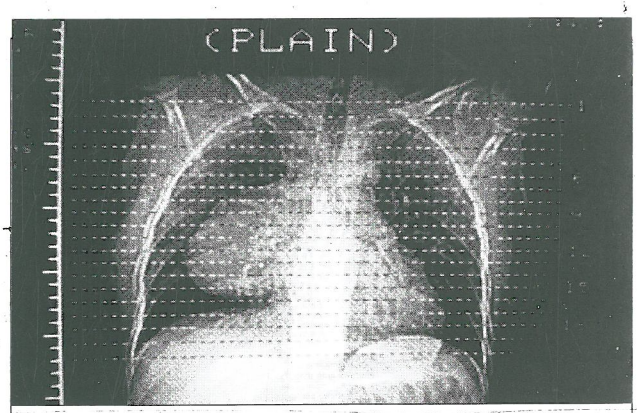


Fig-1: Chest X-Ray shows a right mediastinal mass

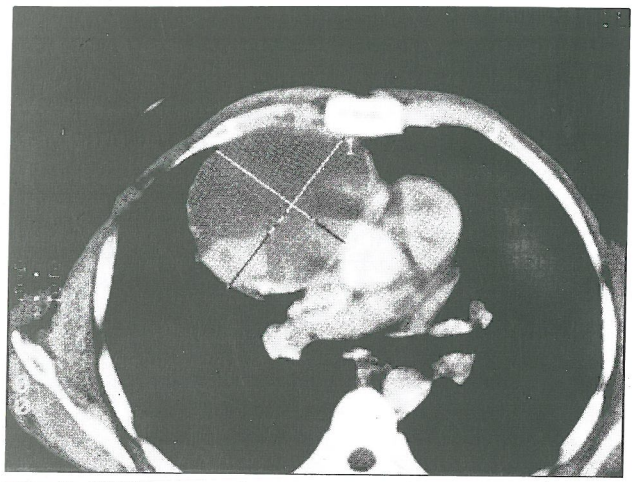

Fig-2: CT Scan confirms the location, the size of the lesion and the cystic appearance.

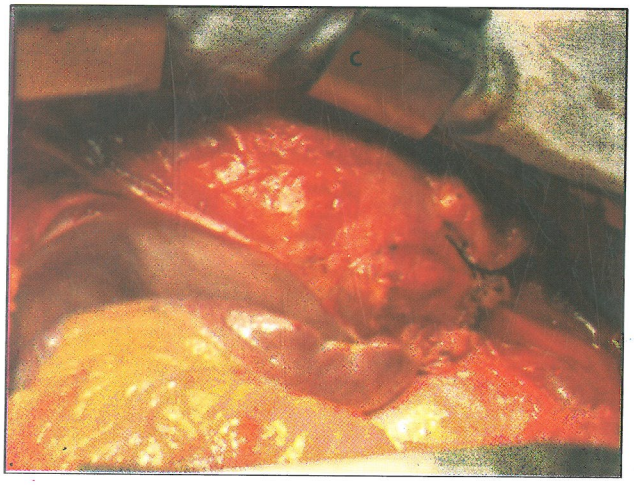

Fig-3:
The lesion on the pleural aspect of the pericardium

The patient was admitted for exploration and excision of the pleura-pericardial cyst.

The anaesthetists were made aware of the diagnosis. For induction of anaesthesia, Midazolam, Propofol, Morphine and Atracurium were used. A standard midline sternotomy was fashioned. The right pleura was opened. The pericardium was also opened A mass (a large pleuro-pericardial cyst) was found adjacent to the right pleuro-pericardium encroaching upon right middle lobe of lung (fig-3). The cyst was completely excised with sharp dissection making sure that no remnants were left behind (fig-4). The cyst was aspirated and thick muddy fluid obtained (fig-5). There was no intra pericardial extension. A thorough inspection was carried out for presence of other masses. Following this the area was extensively washed and suctioned. The cyst was sliced open to reveal the pathology (figs 6,7). The patient remained

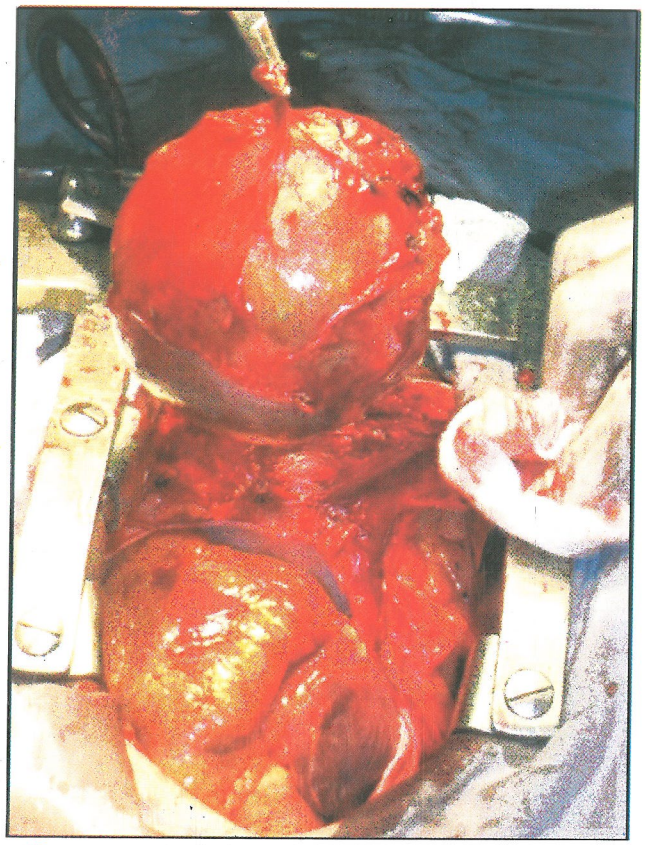

Fig-4: Complete excision of the cyst.

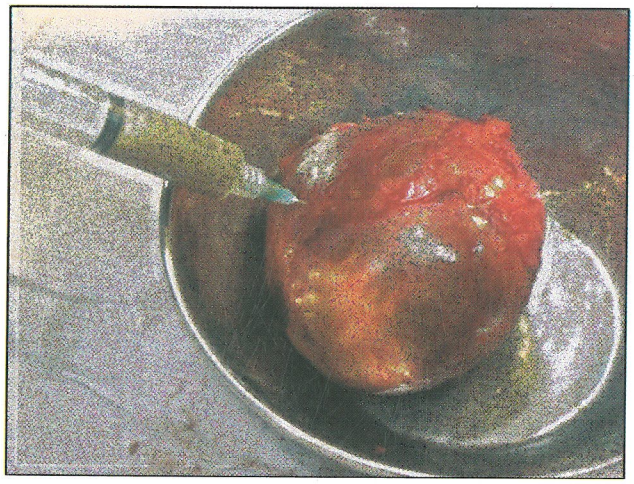

Fig-5: Aspiration reveals a thick muddy exudate.

stable hemodynamically throughout the surgical procedure. The sternal wound was closed and patient shifted in ICU.

Post-operative recovery was uneventful. The patient was extubated successfully on next morning and was discharged home on the 7th postoperative day. Biopsy of the mass showed Type B2 Thymoma. The Patient was thereafter referred to Radiotherapy.

Fig-6: The cystic mass is sliced open.

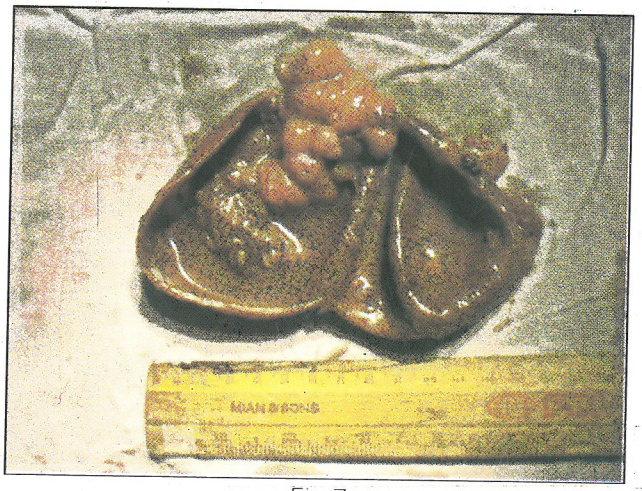

Fig-7:
Drainage of the cystic fluid reveals the pathology.

## DISCUSSION

Mediastinal cysts, which are benign masses, constitute a small but important diagnostic group, representing 12 -18% of all primary mediastinal tumors[1-5]. Most common tumors are neurogenic (20%), thymomas (20%), primary cysts (20%), lymphomas (13%), and germ-cell tumors (10%). Most are located in the antero-superior compartment (54%), followed by posterior (26%) and middle (20%) tumors. Anterior mediastinal cysts most commonly are pleura-pericardial, thymic, teratomatous or cystic hygromas[9].

Pleuro-pericardial cysts are benign mesothelial cysts that arise as a result of persistence of one of the mesenchymal lacunae that normally fuse to form the pericardial sac[10], or due to the failure of an embryological ventral diverticulum to fuse[11] or may arise from the infolding of the advancing edge of the pleura during its embryological development. These cysts are unilocular, contain clear watery fluid, present typically in anterior cardiophrenic angle, more often on right side than left.

True thymic cysts arise from third branchial pouch, are thin walled, unilocular and contain normal thymic tissue within their walls. However, malignant degeneration within a thymoma may result in a cystic thymoma. Current series shows thymic cysts the second most common type: 28.6% of the mediastinal cysts and 3.7% of the mediastinal tumors[7]. Thymic cysts may occur at any anatomic level, from the base of the neck to the diaphragm.[7] Benign anterior mediastinal cysts of pleura-pericardial or thymic origin in adult are mostly asymptomatic unless they become secondarily infected, which is unusual[1,2,3]. Mediastinal cysts can be accurately diagnosed with imaging modalities such as plain chest radiograph, CT, MRI, and Ultrasonography. Asymptomatic cystic lesions are sometimes found during examination or follow-up for other diseases of plain chest radiograph[1,3] With early diagnosis these relatively rare lesions can undergo surgical intervention to establish the definitive histologic diagnosis.

The common tumors and masses in the anterior compartment are of thymic, lymphatic, or germ cell origin. Thymoma is the most common anterior mediastinal tumor in adults, accounting for almost 50% of the neoplasms occurring in this compartment[12-21]including thymomas, thymic carcinomas, thymic neuroendocrine tumors, thymic hyperplasia, thymic cysts, and thymolipomas.

Thymomas originate from either the cortical or medullary epithelial cells of the thymus. They are considered histologically benign tumors even though they may exhibit clinically invasive behavior.

Approximately 50% of individuals presenting with thymomas are clinically asymptomatic. When symptoms are present with these neoplasms, they may be manifested as local or systemic symptoms or a combination of both. Ill-defined chest pain, cough, and shortness of breath are the most commonly identified associated symptoms. More severe symptoms, such as superior vena cava syndrome, phrenic nerve paralysis, or recurrent laryngeal nerve involvement resulting in hoarseness, are less common but are often indications of malignant disease. Invasion of the chest wall

or pleura can also occur with a malignant neoplasm. This can produce persistent pleural effusions and a significant amount of local pain. Other constitutional symptoms in almost 20% of patients include weight loss, fever, fatigue, and night sweats [12-21].

The most common systemic manifestation associated with thymoma is Myasthenia Gravis. This occurs in 10-50% of patients with thymoma and is thought to be an autoimmune phenomenon because a high titer of anti-acetylcholine receptor antibodies is present in these patients. Only approximately 10-15% of patients presenting with myasthenia gravis are found to have a thymoma. The vast majority of patients with myasthenia who do not have a thymoma are found to have thymic hyperplasia, and only approximately 10-20% have no identifiable abnormality of the thymus gland. [12-21]

Other, less common, syndromes can be associated with thymoma. These include other neuromuscular syndromes, hematologic syndromes, immune deficiency syndromes, bone disorders, collagen diseases and autoimmune disorders, endocrine disorders, renal disease, and dermatologic diseases. Neuromuscular syndromes besides myasthenia gravis include myotonic dystrophy, Eaton-Lambert syndrome, and myositis. Hematologic syndromes include red blood cell aplasia, erythrocytosis, pancytopenia, megakaryocytopenia, T-cell lymphocytosis, acute leukemia, and multiple myeloma. Immune deficiency syndromes include hypogammaglobulinemia and T-cell deficiency syndrome[12-21].

The only reported bone abnormality is hypertrophic osteoarthropathy. Collagen diseases and autoimmune disorders include Systemic Lupus Erythematosus, rheumatoid arthritis, polymyositis, myocarditis, Sjögren syndrome, and Scleroderma. Endocrine disorders include hyperparathyroidism, Hashimoto thyroiditis, Addison disease, and Chemodectoma. Renal disorders include Nephrotic Syndrome and minimal change nephropathy. Dermatologic diseases include Pemphigus and chronic mucocutaneous candidiasis. The mechanisms that produce these systemic manifestations are not entirely understood but are believed to be autoimmune in nature[12-21].

As approximately 30-50% of patients with thymomas have some clinical evidence of myasthenia gravis, it is normally recommended to stabilize neuromuscular symptoms associated with this disease with medical treatment, prior to surgery. Drugs include pyridostigmine bromide (Mestinon), corticosteroids, and various immunosuppressive agents. If symptoms cannot be stabilized with medication, plasmapheresis is indicated. This preoperative management should be performed in conjunction with neurologist consultation.

During anesthesia avoidance of perioperative myasthenic crisis is critical so that respiratory function and muscle strength are maximal at the completion of surgery. Usually, only a mild sedative and atropine are given preoperatively. Anticholinergic medications are avoided, as are muscle relaxants. Appropriate levels of anesthesia are obtained using inhalation agents and short-acting narcotics. Airway management with single-lumen endotracheal intubation is performed. Peri-operative short courses of high-dose corticosteroids can be used..

Complete surgical resection is the most critical factor in long-term patient survival, so all neoplasms of the thymus gland (except widely metastatic thymoma) should be completely resected. This includes thymoma, thymic carcinomas, thymolipomas, and neuroendocrine tumors of the thymus and thymic cysts[12-21].Resection of the thymus is also indicated in persons with myasthenia gravis, although a thymic neoplasm is identified in only approximately 15-20% of these patients[12-21]. Tumors or cysts located in the anterior mediastinum are generally approached through a median sternotomy. This approach is used for tumors of the thymus. Other incisions include lateral thoracotomy and bilateral subcostal incision with transverse sternotomy. Partial sternotomy and a trans-cervical approach have also been used. Standard single-lumen endotracheal intubation is appropriate for median sternotomy approach while double-lumen endotracheal tube for single-lung ventilation is preferable for those procedures performed through a thoracotomy incision, clamshell, and VATS.

VATS has been used for resection of selected tumors of the mediastinum. Thymectomy for encapsulated thymomas that range from small to moderate in size has been performed

using this method, as have resection of various neurogenic tumors and foregut cysts. Regardless of the method chosen for thymectomy, operation requires complete removal of all thymic tissue, which generally includes a large adipose component in the adult.

Postoperatively, extubation can be performed at the completion of the case or shortly thereafter.

Patients who undergo resection of benign neoplasms or mediastinal cysts can be followed for a short time (ie, 3-6 mo) postoperatively, while wound healing and progression of patient activity are being monitored.
After resection of a thymoma, patients may be monitored using CBC count, chest radiography, and chest CT studies at appropriate intervals. One published recommendation suggests monitoring postoperative patients with malignant thymoma every 6 months for the first 5 years and annually thereafter. According to this follow-up protocol, a CBC count and chest radiograph are performed every 6 months in the first year, and then these studies, along with chest CT scan, are performed annually[12-21].

Thymomas arise from thymic epithelial cells. They are generally composed of 2 cell types, epithelial and lymphocytic. The morphology of the epithelial cells can be round, oval, or spindle-shaped. The cells are rather large and tend to organize into clusters. They have vesicular nuclei with small nucleoli and cytoplasm that is eosinophilic or amphophilic. The spindle-shaped variety of epithelial cell is often arranged in a whorl-type pattern. Individual cells have an appearance similar to that of fibroblasts. The lymphocytic component of thymomas is made up of mature lymphocytes with no significant atypia.

Thymomas are generally classified as predominantly epithelial, predominantly lymphocytic, mixed lymphoepithelial, and spindle cell type, which is a variant of the epithelial type and is composed mostly of the spindle-shaped epithelial cells. Cellular makeup is not the prime consideration in the determination of a thymoma's malignant or benign potential. The most important features are the gross pathologic characteristics. These include encapsulation of the tumor and fixation or invasion of adjacent structures. While no thymoma is truly benign, well-encapsulated thymomas with no evidence of invasion of the capsule are considered much less aggressive. Any evidence of invasion of the capsule or adjacent structures suggests a much more malignant level of activity. Immunohistochemical staining methods with antikeratin antibodies can be helpful in the histologic identification of a thymoma. A number of thymic epithelial markers, such as cytokeratin, thymosin beta-3, thymosin alpha-1, and epithelial membrane antigen, have also been used[12-21].

Although surgical resection is the preferred treatment for thymoma, patients with clinically unresectable extrathoracic disease require radiation therapy, chemotherapy, or both. Radiation therapy is an essential part of the treatment of any thymoma with invasive characteristics. Controversy exists regarding the use of radiation therapy for patients with stage I tumors; however, it is recommended unanimously for those with tumors in more advanced stages. Radiation therapy has also been used preoperatively to facilitate the resection of bulky tumors; however, this role is usually played by chemotherapy. Cisplatin-based chemotherapy regimens are often recommended for patients with unresectable stage III disease or with disseminated stage IV disease. Chemotherapy is also a useful induction agent for locally advanced thymomas to facilitate resection of these bulky tumors. Cisplatin-based regimens have shown promise for improving both resectability and long-term patient survival[12-21].

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