

Incidental invasive thymoma during coronary artery bypass surgery

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ABSTRACT

لقد واجهنا حالتين عرضيتين لورم تيموسي غازي خلال عمليات إزدراع المجازات الأبهريّة الإكليلية (CABG)، في مستشفى الأردن الجامعي - عمان - الأردن، خلال الفترة ما بين 2005م وحتى 2008م، بنسبة وقوع تقدر بـ 0.6%. كان المريضان يشكوان من ألم خنقي بالصدر، لم يكن لديهما أي أعراض ضاغطة بالصدر مثل (السعال، ضيق تنفس، متلازمة الوريد الأوجف العلوي) أو أعراض الوهن العضلي الخويم. تم استئصال غدة التيموس الكلي مع تسليخ الدهن حول التيموس لكلا الحالتين، ولم يتم إعطاء علاج إشعاعي. لم يعاود الورم الظهور بعد عامين من المتابعة.

We encountered 2 incidental cases of invasive thymomas at Jordan University Hospital, Amman, Jordan; during routine coronary artery bypass graft surgery between 2005 and 2008 with an incidence of 0.6%. Both patients presented with angina pain. None of the 2 patients had pressure symptoms (cough, shortness of breath or superior vena cava syndrome) or Myasthenia Gravis symptoms. Total thymectomy with dissection of perithymic fat was performed on both cases. No radiotherapy was given. No recurrence of the tumor was seen in 2 years follow up. These cases are presented to emphasize the occurrence of this tumor.

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Thymoma is the most common mediastinal neoplasm as well as the most common anterior mediastinal compartment neoplasm constituting approximately 20-50% of all mediastinal and anterior compartment tumors occurring in the adult population. The incidence of thymoma is rare, constituting 0.15 cases per 100,000.¹ Thymoma refers to a neoplasm derived from thymic epithelium. Thymic carcinomas are distinguished from thymoma by their overt cytological malignancy. Thymoma is known for its high recurrence rate in spite of benign histology.² Most patients with thymoma are between 40 and 60 years old, at the time of diagnosis with an equal gender distribution. Surgery has been the standard care for early stage disease with high cure rates anticipated. Multimodality therapy can result in long-term disease-free survival for patients presenting with locally advanced disease. All cases of coronary artery bypass grafting (CABG) that were performed at Jordan University Hospital were reviewed. Two cases of incidental invasive thymoma out of 356 cases were found. These cases are presented to emphasize the occurrence of this tumor, and meticulous management planning is necessary.

Case Report. *Patient one.* A 70-year-old patient with ischemic heart disease (IHD) and chronic renal failure admitted to the cardio surgical unit 3 years ago, as a case of "single vessel disease" involving left anterior descending and diagonal artery for elective CABG. His main complaint was chest pain on moderate exertion that was not associated with fever or weakness. No abnormality was detected on physical examination. There was no history suggestive of Myasthenia Gravis could be elicited. The laboratory tests showed elevated serum creatinine (2.4 mg/dl). No red cell abnormality was detected. Routine chest x-ray showed slight enlargement in cardiac shadow. No CT scan was performed prior to surgery. During surgery and after performing median sternotomy, a large anterior mediastinal thymic mass was found. Thymic veins from the 2 sides were ligated. The mass



Figure 1 - A thymus resected from patient one.

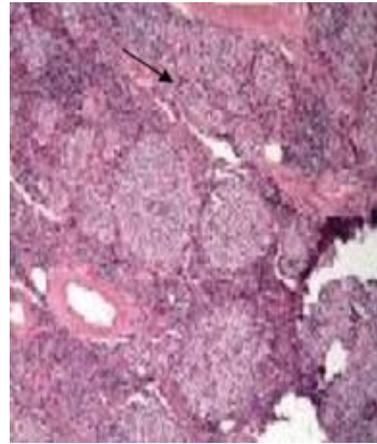


Figure 3 - Lymphocyte rich thymoma (World Health Organization Histological Classification B1).

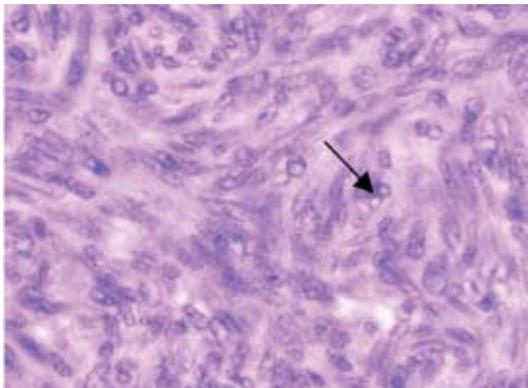


Figure 2 - Thymoma, spindle cell type (World Health Organization Histological Classification A).

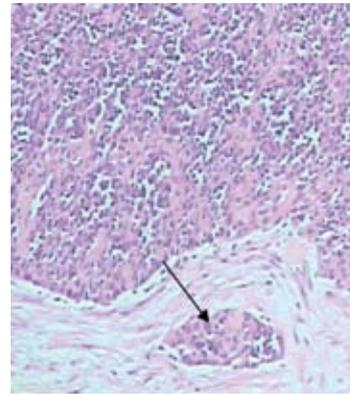


Figure 4 - Thymoma with capsular invasion (patient 2)

(10x5x3 cm) was firm, encapsulated, and lobulated with branching arms (**Figure 1**). Complete excision of the thymic mass with the surrounding perithymic fat and soft tissue from right to the left phrenic nerve area was performed (with preservation of both phrenic nerves). Medial part of pleural tissue was also removed bilaterally. Coronary artery bypass grafting was performed at the same setting. The histopathologic diagnosis was spindle cell thymoma “World Health Organization Histological Classification A (WHO type A)” with multi-focal microscopic capsular invasion (stage 2) (**Figure 2**). Computerized tomography scan was performed periodically in this patient and showed no tumor recurrence after 2 years of follow up.

Patient 2. A 51-year-old male, a known case of IHD with history of myocardial infarction (MI). The patient was admitted to the cardio surgical unit 2

years ago as a case of “triple vessel disease” for elective CABG. No abnormalities were detected on routine physical examination. There was no history suggestive of myasthenias could be elicited. Routine blood tests were normal. There was no red cell abnormalities were detected. His chest x-ray was normal. At surgery, an anterior mediastinal mass (6x4x3 cm in size and 88 gms in weight) was detected. Surgical removal of the entire mass with surrounding perithymic tissue was performed similar to the one described in patient one. Coronary artery bypass grafting was performed at the same setting. Histopathological examination of the excised mass showed lymphocyte-rich predominantly cortical (World Health Organization classification type B1) thymoma, with invasion of the capsule and perithymic fat (stage 2) (**Figures 3 & 4**). Computerized tomography scan was performed periodically in this patient. The last one was 2 years after his operation. There was no evidence of recurrence was seen.

Discussion. In this report, the incidence of thymoma during CABG was 0.6% (2 out of 356 CABAG surgeries). In the literature, it is of similar incident ranging from 0.2-0.7%.^{3,4} Early stages of thymoma (Stages I and II) are best treated with complete thymectomy with removal of upper cervical pole and surrounding mediastinal fat with avoidance of phrenic nerve injury.⁵ Margin-negative surgical resection alone is sufficient treatment for both stages I and II thymoma.⁶ In both cases that we performed, no adjuvant chemotherapy or postoperative radiotherapy was administered to the patients, in spite of invasive nature of both thymomas. The role of postoperative radiotherapy for early stage thymoma is controversial. Adjuvant radiotherapy following complete surgical excision has previously been considered the standard of care despite the lack of prospective clinical trials. Most failures of thymoma treatment are due to pleural recurrence. Radiation of the mediastinum does not prevent pleural recurrences.⁷ In our case, we strongly supported the complete surgical excision as the best mode of therapy without the need for further adjuvant chemotherapy or radiotherapy. This concept was widely used now,⁸ when advanced thymoma are discovered incidentally, and the tumors found to be resectable. The surgical procedure should consist of total thymectomy, and en bloc excision of tumor with adjacent involved pericardium, and pleura. Unilateral phrenic nerve resection can be performed without significant morbidity, although consideration should be given to prophylactic diaphragmatic plication.⁹ Involvement of the great vessels should not preclude the completion of thymectomy. If innominate vein is involved, excision of the vein with reconstruction of the excised segment by synthetic graft should be considered.^{10,11} This should be followed at the same time by CABG procedure.^{12,13} For patients who have residual disease after surgery, a booster radiotherapy dose is recommended.¹⁴ If the tumor is found to be unresectable, there is a widespread pleural or pericardial seeding, or if there are obvious metastases, a biopsy of the tumor should be performed. Both tumor excision and CABG procedure should be abandoned until a definite histopathologic diagnosis is reached.

In summary, findings thymic tumor during CABG surgery is an expected finding, albeit rare. Most of incidentally discovered thymomas require complete

thymectomy as the sole modalities of treatment. Surgeons should be aware of the possible modalities of treatment in such cases before proceeding with CABG procedure.

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