

# Thymic pathology and cardiac myxomas: Coincidence or a closer relationship?

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## Abstract

Myxomas are the most common benign cardiac tumors and are located more frequently in the left atrium. In the literature there are cases describing the coexistence of thymic tumors and cardiac myxomas. In the case reported herein, during the resection of a cardiac myxoma, an enlarged thymus gland was encountered and resected. The histological exam revealed a thymic hyperplasia. The aim of this case study is to assess the need of conducting further studies in order to identify a common histological pathway between thymic lesions and cardiac myxomas. The diagnosis of a cardiac myxoma could justify a further workup of the anterior mediastinum in order not to overlook a lesion of thymic origin.

## Introduction

The incidence of primary cardiac tumors is estimated to be between 0.002% and 0.19% [1]. Myxomas are the most common benign cardiac tumors and are located more frequently in the left atrium, in relation to the fossa ovalis [1,2]. Their histogenesis is not well known [2].

In the literature there are cases describing the coexistence of thymic tumors and cardiac myxomas [3,5]. In the case reported herein, during the resection of a cardiac myxoma, an enlarged thymus gland was en-

countered and resected. The histological exam revealed a thymic hyperplasia. The aim of this case study is to investigate the relationship between cardiac myxomas and thymic pathology, through a review of the literature, and to suggest further workup of the anterior mediastinum before surgical resection of a myxoma.

## Case Report

A 47-year-old female patient, with unremarkable medical history, underwent a routine transthoracic cardiac ultrasonography. A round mass located in the left atrium was discovered and this finding was highly suggestive of a cardiac myxoma (Figure 1). The overall systolic function was normal and there was no sign of valvular disease. A coronary angiography revealed no pathology. The patient was scheduled for the resection of the mass through a median sternotomy. The EuroSCORE I was 2.08% and the EuroSCORE II 0.84%. Intraoperatively, an enlarged thymus gland was discovered without any evidence of tumor. A total thymectomy was performed (Figure 2). Cardiopulmonary bypass was established under bicaval cannulation. Through transatrial approach, the left atrium was opened at the fossa ovalis. A 5-cm sessile mass was found attached to the fossa ovalis and the posterolateral wall of the left atrium (Figure 2). The mass was resected, the left atrial wall was closed and the interatrial septum was repaired by an autologous pericardial patch (Figure 2). The patient was successfully weaned from the cardiopulmonary bypass. There was no sonographic sign of mitral valve leak. The patient spent the first postoperative day on the ICU. Postoperatively, she presented a Mobitz II A-V block that necessitated the implantation of a permanent pacemaker. The patient was discharged on the 20th postoperative day. The histological examination confirmed the hypothesis of a cardiac myxoma (Figure 3). As far as the enlarged thymus is concerned there was a thymic hyperplasia (12 x 5 x 1.5 cm) without any findings suggesting a tumoral pathology (Figure 3).

## Discussion

Cardiac myxomas have a good prognosis and a low surgical mortality rate [1]. Clinical symptoms may vary and depend on the size and location of the tumor (embolization, arrhythmias and hemodynamic disturbances) [1,5]. In the present case report the patient was asymptomatic probably due to the large implantation base of the tumor in the left atrial wall, rendering it motionless and thus preventing obstruction of the leaflets of the mitral valve. Transthoracic cardiac ultrasound is the mainstay imaging technique for their detection but cardiac MRI has become widely accepted as a primary technique in the workup of cardiac tumors [1]. The coexistence of multiple cardiac myxomas, pig-

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mented skin lesions and extracardiac tumors constitute a syndrome known as Carney's triad, which shows an autosomal dominant inheritance [6]. Their histogenesis is not well known [2,4]. According to Acebo *et al.* who were inspired by the work of Prichard (1951), myx-



Figure 1. Transthoracic cardiac ultrasound image showing the left atrial tumor.

omas are supposed to originate from subendothelial vasoformative cells, or from primitive cells which are located in the fossa ovalis and surrounding endocardium, known as primitive multipotential mesenchymal cells or "cardiac reserve" cells [2]. However, their existence is not clearly demonstrated. Miller *et al.* adopt the same theory but they describe in addition the phenomenon of heterotopias in order to explain the presence of a thymoma within a cardiac myxoma [4].

There are also other case reports suggesting a close relationship between cardiac myxomas and thymic pathology, but without clear evidence of a common histological pathway. Futami *et al.* described a mediastinal mass that was suspected to be a myxoma originating from the right atrium. A preoperative transvenous catheter biopsy was suggestive of myxoma but finally the lesion was proved to be a thymoma with caval and atrial invasion [3]. Seemann and Brenner reported the co-existence of a right atrial myxoma with bilateral pulmonary tumor emboli and a benign thymoma [5]. In the case reported herein a thymic hyperplasia was a fortuitous intraoperative finding during a scheduled resection of a cardiac myxoma. Certainly, this coexistence could be simply a coincidence, but it should not exclude a closer relationship between thymic pathology and cardiac myxomas.

## Conclusions

The case reported herein and the review of the literature should stimulate the conduction of further studies in order to identify a common histological pathway between thymic lesions and cardiac

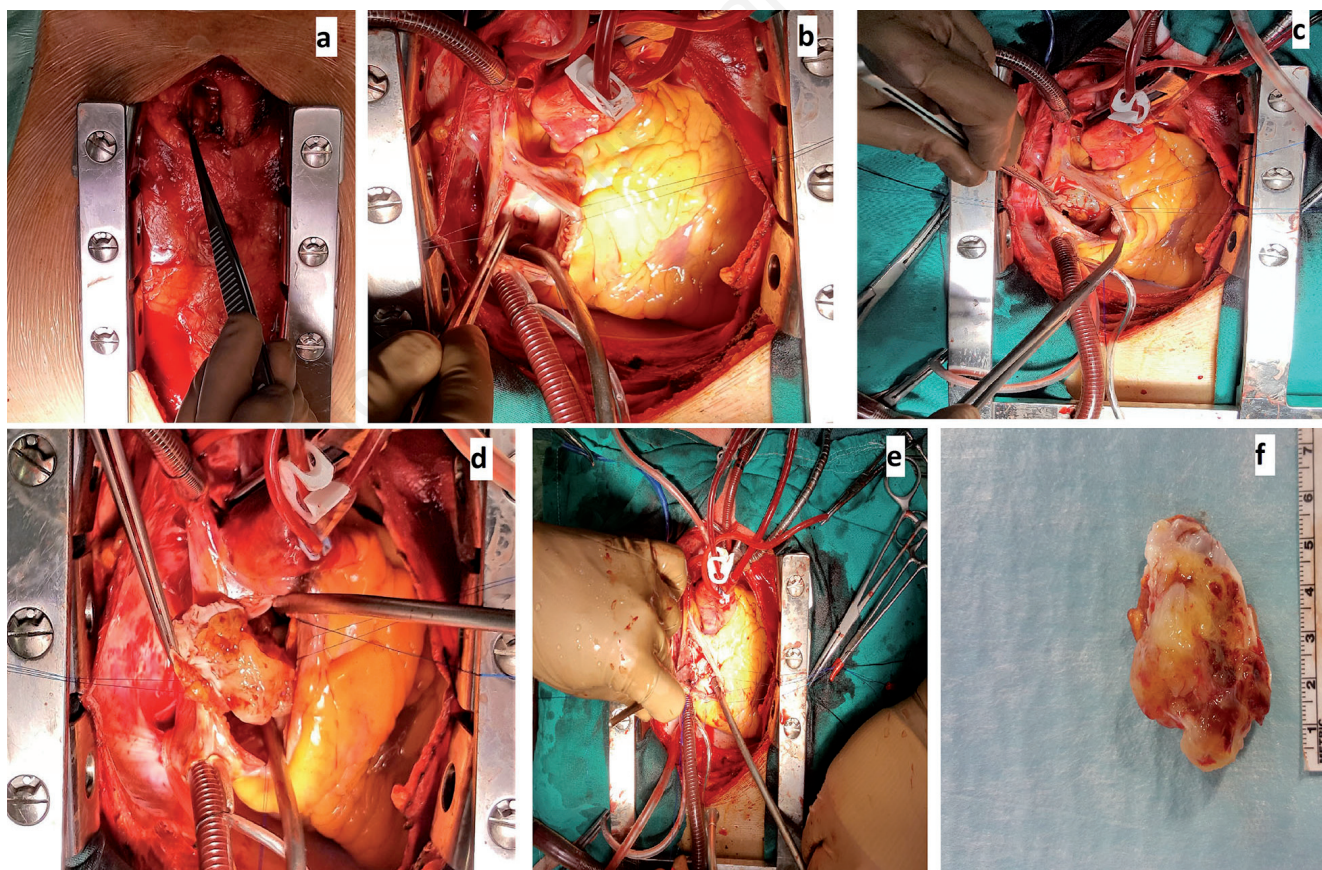


Figure 2. Perioperative images. a) View of the hyperplastic thymus through the median sternotomy; b) transatrial approach (fossa ovalis); c) view of the myxoma in the left atrium; d) resection of the myxoma; e) repair of the interatrial septum by an autologous pericardial patch; f) surgical specimen of the myxoma.



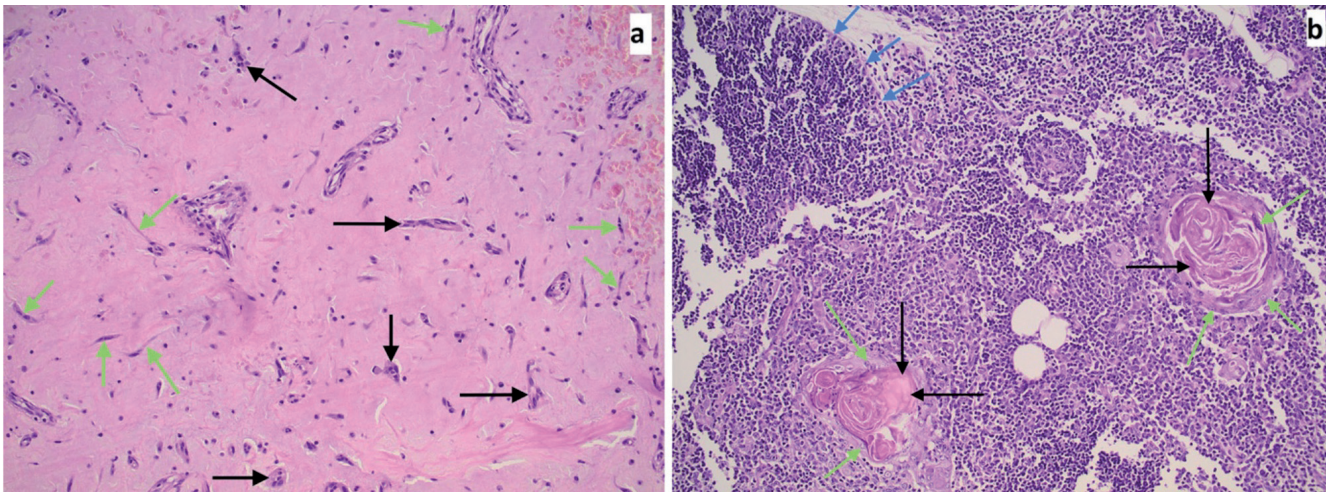


Figure 3. Histological images of the two resected lesions. a) The neoplastic cells in the myxoma can be seen creating many different structures, such as syncytial formations (black arrows) and either short or longer chords of cells (green arrows), embedded in an abundant mucopolysaccharide-containing stroma (H/E, x20); b) typical microanatomy of the thymus comprising of the denser cortex (blue arrows) which is mainly made up of thymocytes (thymic lymphocytes), and the thinner medulla where the characteristic Hassall's corpuscles are found; these nodular formations show a keratinous central area (black arrows) and a peripheral ring of mature epithelial cells (green arrows) (H/E, x20).

myxomas. The diagnosis of a cardiac myxoma could justify a further workup of the anterior mediastinum, probably a computed tomography with contrast injection, in order not to overlook a lesion of thymic origin.

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