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Case Report

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Cardiac Myxoma: Characterization by 3d-Transillumination Rendering in the Era of Multimodal Imaging. A Case Report

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Abstract

The heart is an infrequent location for primary tumors. When they appear, they usually emerge as myxomas (slow growth bening forms). We present a 68-year-old man who was discovered of a left atrial mass in a routinary echocardiography. A transesophageal test was then performed to better study the finding. We highlight "Transillumination"as a new technology which processes the 3D image by operating with the image's enlightenment. It provides a better tissue characterization, allowing a superior description of the mass, in this case. The bulk was surgically removed, and its histological analysis established the diagnosis of a myxoma.

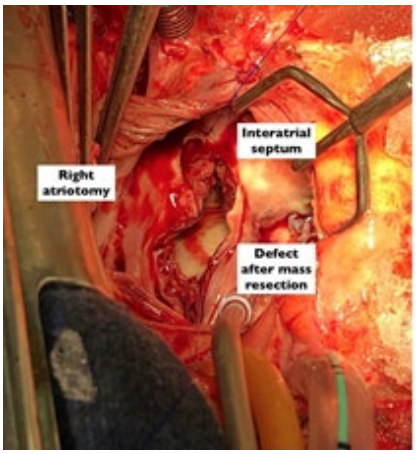
1. Introduction

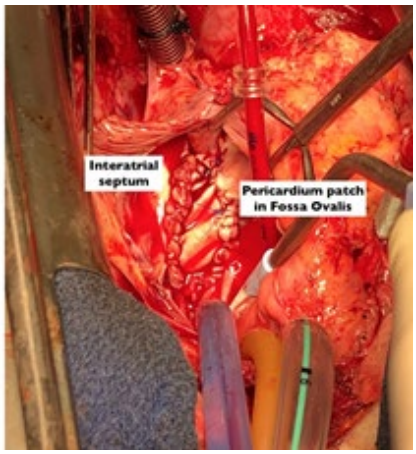
Since cardiac tumors are less common than those in other locations and that in the presence of an image of a left atrial mass one possibility is that it is an intracavitary thrombus, the diagnostic approach to cardiac masses remains to be a challenge nowadays. The incidence of primary cardiac tumors found at autopsies is less than 0.3% , but with the use of new imaging techniques, especially the widespread use of echocardiography, they are becoming increasingly diagnosed [1,2]. Among benign cardiac tumors, the most common is myxoma, representing more than 50% of primary ones, its preferred location is the left atrium -with an anchoring point generally in the interatrial septum-, although they have also been described in the right atrium, right ventricle, and left ventricle, in this order [3,4]. They ordinarily emerge as single tumors, with a wide range of presentations, from asymptomatic forms to variable clinical manifestations such as heart failure or systemic embolisms. Surgical resection is considered a curative procedure with a minimal risk of recurrence (less than 1-3%), except in those sporadic cases of familial forms, when they can arise multiple times, frequently with documented higher rates of subsequent recurrence (9).

2. Case Presentation

We present a 68-year-old man with clinical follow-up by the Cardiology Departmen for ages because of a mixed ischemic-valvular heart disease, with a bicuspid aortic valve and an ascending aortic aneurysm, who underwent surgery in March 2018. He was performed a modified Bentall-Bono surgery with a valved tube of 25-28mm and double aorto-coronary bridge with left internal mammary artery (LMA) to LCA and with right mammary artery from LMA to obtuse marginal circumflex, with a satisfactory result. After this intervention, he maintained a periodical follow-up in outpatient cardiology consultation, always remaining in NYHA class I.

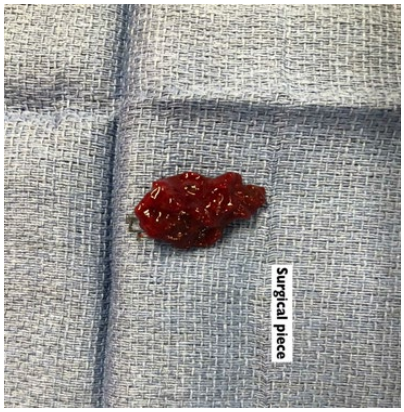
In the January 2021 examination, a control echocardiogram was performed. It showed normal systolic function, without segmental alterations in contractility, and a mechanical prosthesis in aortic position with normal functioning. However, it became patent the existence of a mass in the left atrium, not present in previous studies (last one from 2018). It was irregularly shaped and had a wide implantation base, closely related to the interatrial septum (Figure 1).

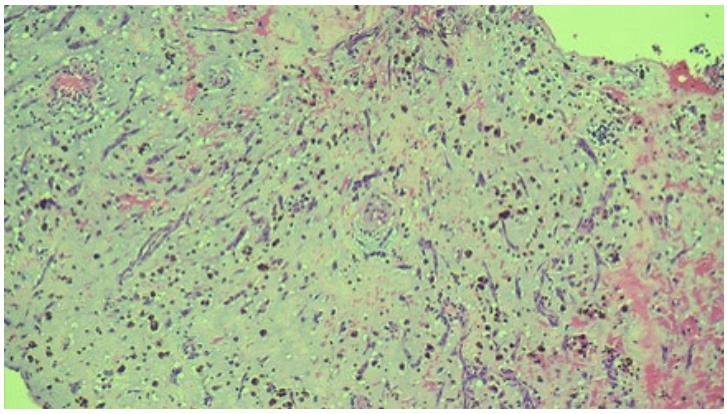


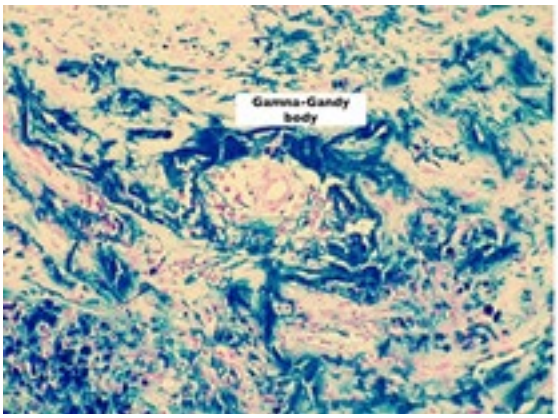


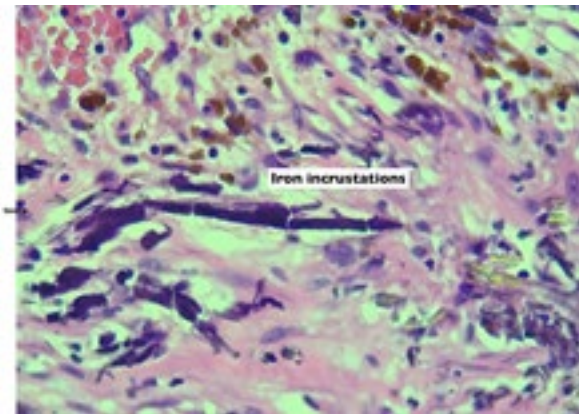
Since the early postsurgical moment, the patient remained in treatment with acenocoumarol, having presented good chronic control of his INR records over these years. However, two weeks before the current echocardiogram, oral anticoagulation had been disturbed for a few days because of a diagnostic colonoscopy, being replaced by low molecular weight heparin as bridging therapy according to protocol.

Considering this unexpected finding, a transesophageal echocardiogram was scheduled. By this moment, the main possible hypothesized diagnoses were an atrial thrombus or a cardiac myxoma, considering the rarer possibility of another type of tumor mass. The study exposed an image of a vegetative mass with mameloned edges, coral-shaped, and maximum diameters of 4.3x3.9x2.7cm. It emerged from the upper region of the left atrium, adhered to the interatrial septum by means of a laminated pedicle, close to the fossa ovalis (Figures 2 and 3). For the purpose of accurately assessing the features of the mass, True-View transillumination technology was used, exhibiting a heterogeneous density of the mass, with echolucent areas of hemorrhage foci, highly suggestive of atrial myxoma (Figure 4 and Figure 5).









Subsequent to case discussion by the Heart Team assembly, surgical resection of the aforementioned atrial mass was accepted by consensus.

The intervention was carried out one week later through a median sternotomy, exhibiting conventional adhesions, secondary to previous surgery. The left mammary artery was dissected and controlled, noting that it is chronically occluded due to probable competitive flow by the native coronaries. Cannulation is performed through the left femoral artery and vein and superior vena cava. Cardiac arrest with antegrade and retrograde cardioplegia was then initiated, performing a right atriotomy and approach through the interatrial septum (Figure 6).

During the surgical procedure, a gelatinous mass with a 1 cm-length supporting base was seen in the fossa ovalis, being isolated in several fragments. A sample was sent to the Pathological Anatomy Department for analysis (Figure 7).

The procedure is accomplished by repairing the septum with a bovine pericardium patch and extracorporeal circulation exit, proceeding with cerclage of the sternum and closure of the subcutaneous cellular tissue and skin by planes. Primarily, the patient was dependent on inotropic support and pacemaker electrostimulation.

The earliest postoperative period advanced without complications, with early extubation. Withdrawing of vasoactive drugs and pacemaking could be achieved in a short time. First-degree AV block persisted during his stay on the hospital ward but he was discharged from the hospital without any problem eight days later.

Finally, the definite pathological analysis of the resected fragment specimen confirmed a histology characteristic of atrial myxoma with the presence of Gamna-Gandy bodies (Figure 8 and Figure 9).

3. Discussion

Facing a cardiac mass diagnosis, it is mandatory to pay attention to several features during proper echocardiographic evaluation. Its intra- or extracardiac location, its setting and implantation development, its relationship with adjacent structures, its shape and size, and the hemodynamic effects derived from it. Based on these characters, a suspicion about its benign or malignant etiology can be established [1].

Myxoma is the furthermost prevalent primary cardiac tumor, representing nearly 50% of overall cases. The most common presentation is in isolation, although they can sometimes be associated with inherited autosomal dominant family forms. The latter usually emerge at younger ages, in a multiple presentation and recur more frequently after surgery [1].

Cardiac myxomas may result in a vast collection of presentations. From asymptomatic forms to variable clinical manifestation. The classic triad is known as bloodstream obstruction, embolization, and nonspecific constitutional syndrome. Nevertheless, they occasionally occur without any symptoms, especially in early stages, composing an incidental finding in an imaging test such as the forehead mentioned case.

Although the characterization of cardiac tumors often demands the combination of several imaging techniques, additional studies may not be required to assess certain masses (such as myxomas and fibroelastomas). Echocardiography has the advantage of its broad availability, being straightforward skill for the initial evaluation, providing information not only on the mass and cardiac structures' anatomy, but also on the hemodynamic effects derived from it.

In these circumstances, a transesophageal echocardiogram (TEE) should be chosen, given the superior diagnostic convenience of this procedure due to the closeness of the esophagus to the heart, the absence of intervening lung and bone, and the ability to use high-frequency image transducers. It affords with further superior spatial resolution.

Moreover, and providing the opportunity for a better analysis of the identified structures, we can take advantage of new technologies for tissue characterization such as "TrueVieW". It emerges as a novel three-dimensional photorealistic rendering method that allows us to process the 3D image by operating with the image's illumination: modulating and shifting a "spotlight", thus providing greater anatomical information on cardiac structures [5]. As a consequence, thus supporting a firm and brisk judgement through an ingenious light and shadow's play. Despite the shortage of data, TrueView still appears to be a useful tool that delivers a complementary aid in complex backgrounds, in interventional procedures and for the characterization of intracavitary masses, as our case illustrates [6].

References

1. Straus, R. (1945). Primary tumor of the heart. *Arch Pathol, 39,* 74-78.
2. Abad, C. (1998). Tumores cardíacos (I). Generalidades. Tumores primitivos benignos. *Revista Española de Cardiología, 51*(1), 10-20.
3. Bjessmo, S., & Torbjörn Ivert, M. D. (1997). Cardiac myxoma: 40 years' experience in 63 patients. *The Annals of thoracic surgery, 63*(3), 697-700.
4. Keeling, I. M., Oberwalder, P., Anelli-Monti, M., Schuchlenz, H., Demel, U., Tilz, G. P., ... & Rigler, B. (2002). Cardiac myxomas: 24 years of experience in 49 patients. *European journal of cardio-thoracic surgery, 22*(6), 971-977.
5. Karagodin, I., Addetia, K., Singh, A., Dow, A., Rivera, L., DeCara, J. M., ... & Lang, R. M. (2020). Improved delineation of cardiac pathology using a novel three-dimensional echocardiographic tissue transparency tool. *Journal of the American Society of Echocardiography, 33*(11), 1316-1323.
6. Genovese, D., Addetia, K., Kebed, K., Kruse, E., Yamat, M., Narang, A., ... & Lang, R. M. (2019). First clinical experience with 3-dimensional echocardiographic transillumination rendering. *JACC: Cardiovascular Imaging, 12*(9), 1868-1871.