Instituto Nacional Cardiovascular
Archivos Peruanos de Cardiología y Cirugía Cardiovascular
Arch Peru Cardiol Cir Cardiovasc. 2023;4(1):37-40. doi: 10.47487/apcyccv.v4i1.275.
Sociedad Científica de Medicina Cardiovascular del Perú

Case report

Right atrial lipoma. A case report

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Received: 16 january 2023
Accepted: 23 march 2023
Online: 31 march 2023

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Funding
Self-financed

Conflicts of Interest
The authors declare no conflict of interest.

Cite as:
Arévalo-Santa-María A, Gonzales-Castro S, Salas-Escobedo G, Ríos-Ortega JC. Right atrial lipoma. A case report. Arch Peru Cardiol Cir Cardiovasc. 2023;4(1):37-40. doi: 10.47487/apcyccv.v4i1.275.

ABSTRACT

We present the case of a 56-year-old male patient with a history of atrial flutter that occurred six months prior to admission. He was admitted to the hospital for presenting a mass with a size of 8 cm in the right atrium, which prolapsed through the tricuspid valve into the right ventricle. Emergency surgery was scheduled, the tumor was excised and tricuspid annuloplasty was performed. The pathological study determined that the removed mass corresponded to a cardiac lipoma.

Keywords: Heart Neoplasms; Lipoma; Cardiac Surgery (source: MeSH-NLM).

Introduction

Cardiac tumors are rare, and it is known that primary tumors are less frequent than secondary tumors; they can occur in the pericardium or myocardium and their incidence is less than 0.3% [1-3]. So far, there is no important report of cardiac lipomas, they occur at any age and have the same frequency in both sexes, although they mainly affect the left ventricle and the right atrium [4]. Simultaneous involvement of both atria, pulmonary veins, vena cava and right phrenic nerve has also been described [5].

Although some authors suspect a congenital origin in the dysembryomas group, or acquired that coincide with obesity of recent onset, its etiology is unknown [6]. The cardiac lipomas diameters are variable, and most of them are sessile and of subendocardial origin [4]. Patients rarely present arrhythmias or heart failure symptoms and are usually quite asymptomatic [4].

Case report

A 56-year-old male, from southern Peru, was transferred to our institution with a previous episode of atrial flutter that occurred six months prior to admission, so he was treated with rivaroxaban. He had been sick for approximately two weeks, characterized by palpitations and precordial pain (intensity: 7/10) without irradiation. At another hospital, he was found to have a right atrial mass and was transferred with diagnosis of right atrial intracardiac tumor and sinus bradycardia for definitive treatment.

Physical examination revealed rhythmic, regular, bradycardic heart sounds, non-audible murmurs, no jugular ingurgitation or hepatojugular reflux, no hepatomegaly or edema. The admission electrocardiogram showed a nodal rhythm with bradycardia. The admission electrocardiogram showed a nodal rhythm with bradycardia. Transthoracic echocardiography showed a tumor with a size of 8.3 x 7.7 x 5.3 cm in the right atrium, apparently implanted in the right coronary sinus and interatrial septum **(Video 1 and 2).** In addition, there was predominant right biatrial dilatation, mild tricuspid regurgitation, high probability of pulmonary hypertension, left ventricular ejection fraction of 60% and borderline right ventricular systolic function. Multi-slice spiral computed tomography **(Figure 1)** showed marked dilatation of the right atrium with a hypodense tumor inside and no masses were found in the lungs or abdominal viscera. Laboratory tests showed: hemoglobin: 15.6 g/dL, leukocytes: 6690 x 10^3/uL, platelets: 228,000 x 10^3/uL; international normalized ratio [INR]: 1.38; urea: 26 mg/dL, and creatinine: 0.99 mg/dL. After case evaluation by the cardiology team, emergency surgery was decided.

The surgical procedure was performed by median sternotomy with aortic-atriocaval cannulation, in addition, cardiac arrest was performed with Histidine-Tryptophan-Ketoglutarate (HTK) (Custodiol®) solution via anterograde route. We found a fatty tumor with a size of approximately 10 x 12 cm **(Figure 2)**, attached to the roof of the right atrium, atrial appendage and near the superior vena cava insertion by right atriotomy. After removing the tumor, a significant dilatation of the tricuspid annulus was observed, so annuloplasty was performed using a 30 mm ring. It was sent to cytology for imprinting and a negative result for malignancy was obtained. Total surgery time: 5 h 30 min, extracorporeal circulation time: 1h 26 min and aortic clamp time: 1 h 09 min. The pathological study reported the presence of right atrial lipoma.

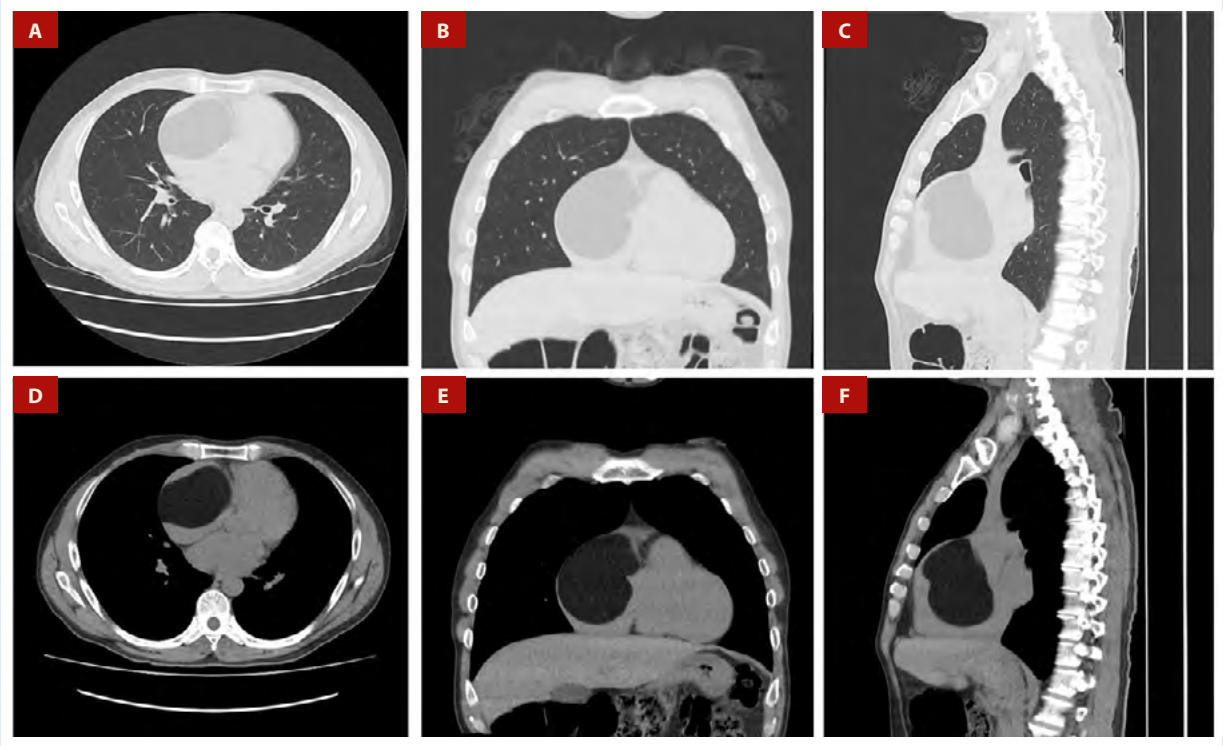

Figure 1. Preoperative computed tomography images. **A, B** and **C.** Parenchymal view in axial, coronal and sagittal sections showing isodense image in right atrium**. D, E** and **F.** Mediastinal view in axial, coronal and sagittal sections showing hypodense image in right atrium.

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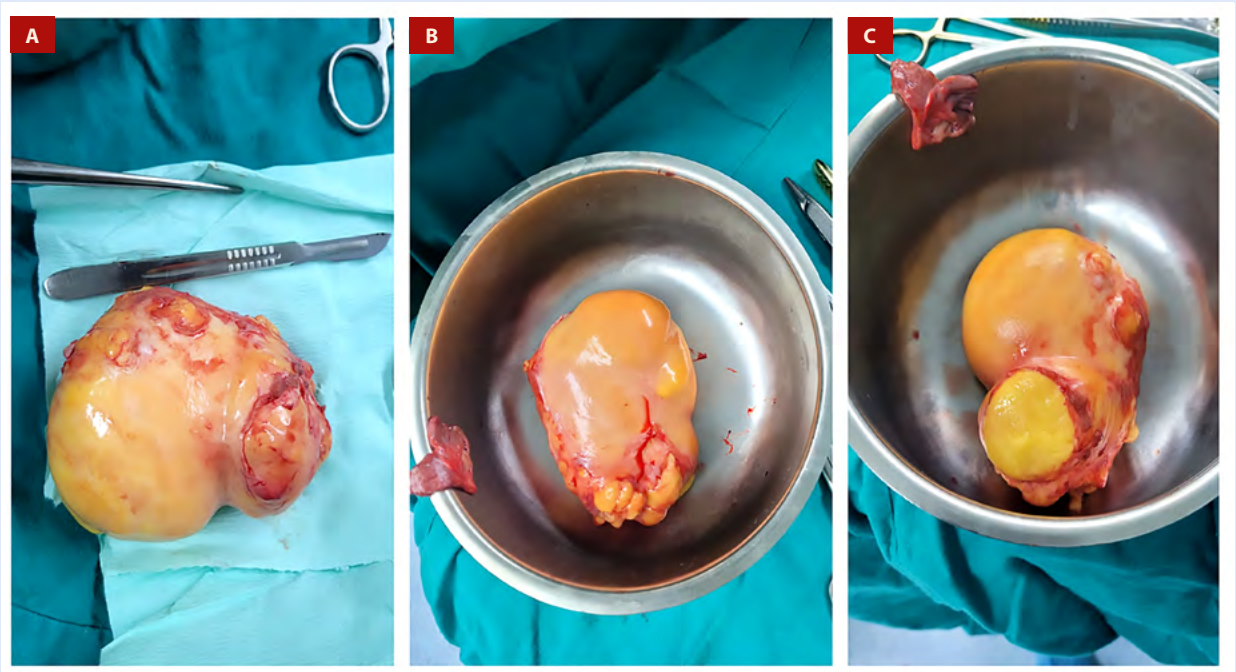

Figure 2. A, B and C. Postoperative images showing a fatty consistency tumor with a size of 10 x 12 cm.

The evolution was favorable and mechanical ventilation was weaned two days later. In addition, pericardial and mediastinal drains were removed on the second and fourth postoperative days, respectively. The patient was transferred to the cardiology service on the fourth day for continuation of his sinus bradycardia treatment, and placement of a permanent pacemaker. He was discharged 2 days later with no further intercurrences.

Discussion

Cardiac tumors are rare and develop without striking symptomatology, so the diagnosis, in most cases, is made in advanced stages of the disease [7], therefore, the importance of early suspicion and diagnosis, entails the possibility of cure by surgery. Most of cardiac tumors are benign and the most frequent is myxoma [7]. A study conducted in China showed a frequency of 50% for myxoma among all cardiac tumors studied, while lipoma was the second most frequent [7].

Most of lipomas reported are subendocardial or epicardial, and only 25% are intramyocardial [8]. Their most frequent location is the left ventricle [8]. In spite of this, Nevado *et al.* [4] reported the case of a 24-year-old male completely asymptomatic, studies were complemented by finding a cardiac murmur, and the pathology report showed the presence of lipoma in the right ventricle. Lipomas are encapsulated masses composed of mature fat cells and even fibrous tissue [4] that can be surrounded by myocardium [8]. Diagnosis is usually a challenge since it develops with little or almost no symptomatology and therefore it is usually found by chance in autopsies or some chest X-rays [8]. One of the main diagnostic tools is echocardiography, which can be performed even during the fetal period [7]. In intracavitary extension cases, patients may develop characteristic symptoms of right heart failure, arrhythmias or conduction disorders, which leads to suspicion and diagnosis more easily [4].

Garcia *et al.* [5] reported the case of a 26-year-old patient with stabbing retrosternal pain of moderate intensity associated with palpitations, profuse diaphoresis and sudden onset nausea, a non-specific symptomatology, but more florid compared to the case reported here. However, the diagnosis was not simple, after the electrocardiogram showed an incomplete right bundle branch block, transthoracic and transesophageal echocardiography would give the diagnosis of a right atrial mass. Finally, a magnetic resonance imaging would orient the compatibility of the characteristics to a lipoma; very similar to the case we present, omitting this last test since it is not available in that hospital.

We must be clear that it is difficult to suspect this pathology after an adequate anamnesis and physical examination, so it is necessary to complement with different types of images, which could guide us on the tumor lineage. Echocardiography, computed tomography and magnetic resonance imaging make

it possible to diagnose and characterize the lipomatous nature, especially, when the magnetic resonance imaging is performed with fat suppression, which makes it possible to delineate its extension with greater precision [5].

These tumors can show an intermediate density (fat) in a frontal chest X-ray, which is relatively lower than other soft tissues, whereas a computed tomography has a high specificity for the diagnosis of these tumors, since it shows the location, dimension and density, although the latter is quite low. The literature describes a density of less than 55 HU (Hounsfield units) [8].

In general, echocardiography, computed tomography and magnetic resonance imaging are of significant value for the diagnosis of cardiac lipoma [9]. However, echocardiography should be the test of choice due to its low cost, easy accessibility and ability to determine the location, shape, size and presence of blood flow [9]. Echocardiography has a sensitivity of 90% and specificity of 95% for the diagnosis of cardiac tumors; however, it remains operator-dependent, so these values may vary depending on their origin.

Once diagnosed, treatment is indisputable to prevent complications due to the high possibility of producing obstruction, embolism, and arrhythmias. Therefore, the tumor should be removed as soon as possible even in asymptomatic patients [8].

The surgical approach depends on several variables such as the size, the location of the mass and the compromise of different cavities; according to this approach we will be able to determine the surgical procedure [10]. Different approaches have been described, such as sternotomy, clamshell incision or left or right thoracotomy [10]. In the case reported, surgical treatment is curative. However, the larger the mass or the more adherent it is to the conduction system, the more limited the approach is, which in some cases causes sudden death, heart block, among others.

The pathology of cardiac tumors is very broad, and the risk of morbidity and mortality depends not only on the size and location of the tumor, but also on its cellular lineage. Thus, we can face both benign and malignant pathologies, from small to gigantic, and most of them are asymptomatic. Therefore, it is important to emphasize the importance of a quick and early diagnosis to prevent delays in transfers to specialized centers that have a multidisciplinary medical team and a quick planning of the necessary surgery.

In conclusion, cardiac lipoma is a rare pathology among all cardiac tumors, so the present case deserves considerable attention, especially because of the challenge involved in suspecting and diagnosing it. This situation makes early diagnosis and definitive treatment difficult; however, due to the availability of technological advances in terms of imaging diagnostic methods, it was easier to plan an adequate surgical approach and avoid further complications. Its suspicion and management require a multidisciplinary team of cardiologists, cardiothoracic surgeons and intensivists. Surgical management is the treatment of choice when the pathology is diagnosed, whether symptomatic or not.

Author´s contributions: SGC and GSE participated in data collection and approval of the final version of the manuscript. AASM and JCRO participated in the study design, review and drafting of the manuscript, and approval of the final version of the manuscript.

Ethical aspects: The patient gave his consent for the clinical case to be performed.

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