Introduction

Primary tumors of the heart are extremely rare, with an incidence between 0.0017% and 0.056% according to autopsy reports [1]. Lipomas account for 8.4% of benign tumors of the heart [2]. Although histologically benign, they sometimes cause serious health issues such as syncope, dizziness, sudden cardiac death, peripheral embolism, depending on the size and location. Cardiac lipomas are usually incidentally found.

Obstructive sleep apnea (OSA) is a sleep disorder defined as a complete (apnea) or partial (hypopnea) upper airway obstruction. Polysomnography (PSG) is the gold standard for the diagnosis of OSA. The most common sleep variable which is measured during PSG is apnea hypopnea index (AHI) which is defined as a sum of apneas and hypopneas per hour of sleep [3]. The AHI index of five or more sleep events per hour is consistent with the diagnosis of OSA [4].

Case Report

We report the case of a 69-year-old male who was admitted to our hospital for evaluation of fatigue and progressive dyspnea on exertion and in the supine position for the past few years. His previous medical history included OSA, hypertension and obesity. His body mass index (BMI) was 35.5 kg/m². The OSA was treated with continuous positive airway pressure (CPAP), but with no significant improvement of symptoms during the treatment. On admission, physical examination, laboratory test results, vital signs and electrocardiogram (ECG) were normal. Transthoracic echocardiography (TTE) showed a mass in the right atrium, so transthoracic echocardiography (TOE) was performed. The patient underwent open heart surgery, and the tumor was extracted with no intraoperative and postoperative complications. During a 1-year follow up, he remained asymptomatic, with no clinical signs of obstructive sleep apnea after the surgery.

Conclusion

When it comes to the diagnosis and treatment of obstructive sleep apnea, cardiac tumors should be considered.

Key words: Sleep Apnea, Obstructive; Lipoma; Heart Neoplasms; Heart Atria; Diagnosis; Cardiac Imaging Techniques
formed for better characterization of the mass. The TOE showed a well circumscribed tumor mass, sized 39 x 30 mm in the right atrium (Figure 1).

In order to thoroughly evaluate the size and position of the tumor mass and its relations to neighboring structures, computed tomography (CT) was performed, showing oval homogenous, hypoechogenic (-110 HU) mass sized 53 x 36 x 23 mm between the superior vena cava (SVC) and right and left atrium (Figure 2). The SVC was compressed by the tumor and narrowed to a 3 mm diameter. The CT showed no infiltration of the surrounding structures. Multislice computed tomography (MSCT) of the coronary arteries was simultaneously performed and showed no significant stenosis of epicardial coronary arteries.

A multidisciplinary team, including a cardiologist, cardiac surgeon and a thoracic surgeon, made a decision for surgical treatment. The patient underwent cardiac surgery with extracorporeal circulation, and the subepicardial tumor, located between the SVC and Sondergaard’s groove, was completely extracted (Figures 3 and 4). There were no complications in the perioperative and early postoperative period.

The histopathological examination showed yellow groups of mature fat cells, with interlobular fibrous septa, confirming the diagnosis of a benign cardiac lipoma. The patient was discharged on the 10th postoperative day, with significant improvement of symptoms.

The PSG examination 6 months after the surgery showed that AHI was below the diagnostic value for obstructive sleep apnea.
OSA, even though his BMI remained unchanged. During the one-year follow up he was with no symptoms and handling physical strains with no problems.

Discussion

Cardiac lipomas are rare benign, usually small tumors of the heart that are, in the majority of cases, incidentally found at autopsy [5]. They may cause symptoms that vary from mild fatigue to very severe medical conditions like heart failure and sudden cardiac death. We reported a rare case of cardiac lipoma that caused obstructive sleep apnea syndrome (OSAS) by compressing the SVC.

The OSAS is characterized by repetitive episodes of apnea due to upper airway collapse during sleep. Rarely, OSAS may occur when there is a narrowing of the upper airway by edema and vascular congestion resulting from superior vena cava syndrome (SVCS) [6, 7].

The proposed mechanism of OSAS in SVC compression is the increase of cervical venous pressure to 20 or even 40 mm Hg, comparing to the normal range of 2 to 8 mm Hg [8]. That increase of hydrostatic pressure is likely to cause transudation of fluid into the interstitial space surrounding the upper airway [9].

Few clinical cases have been reported about OSAS caused by SVCS in the literature. Mediastinal compression of SVC due to malignant, as well as non-malignant processes have been reported [7, 10, 11], but none of them reported about cardiac lipoma.

To our knowledge, this is the first reported case of lipoma in the atries of the heart presenting as OSAS.

There are literature reports on heart hemangioma causing OSAS [12]. Total surgical extraction of the tumor causes disappearance of OSAS symptoms, which is in agreement with our findings. The etiology of cardiac lipomas still remains unclear, with no significant difference in prevalence in regard to age and gender [13]. The main difference between lipomas and lipomatous hypertrophy collection is the presence of a tiny capsule [1]. Regarding the origin, cardiac lipomas can be divided into subendocardial (the most common), subepicardial, and myocardial [5].

The diagnosis of cardiac lipoma is nowadays easier with improvement of the imaging techniques, including TTÉ, TOE, CT and magnetic resonance imaging, which provide not only information about the size and location, but also effects of the tumor on hemodynamics and composition of the tumor [5].

At CT, lipomas appear as homogeneous hypodense masses with negative attenuation values between −50 and −150 HU [14]. It is necessary to pay attention to differentiate low grade liposarcomas from benign lipomas. At CT, low grade liposarcomas generally appear heterogeneous with thickened septae [15]. Also, the pathological diagnosis of the tumor is usually needed to finally distinguish lipomas and well differentiated liposarcomas [1].

In our case, attenuation value of hypodense formation was typical for lipoma which was confirmed by histopathological analysis.

Although cardiac lipomas usually remain asymptomatic, they may cause a variety of symptoms, depending on the size and location. They can cause obstruction of the outflow tract, heart valve dysfunction, vena cava compression, arrhythmias, syncope, chest pain, dispnea and even sudden cardiac death [16].

The recommended treatment for symptomatic cardiac lipomas is surgery, with complete extraction of the tumor and the capsule local recurrence is quite low, even with subtotal resection [17]. We performed a total tumor extraction and during the follow-up no clinical or echocardiographic signs of local recurrence were noticed.

Conclusion

In conclusion, cardiac tumors should be considered as a potential cause of obstructive sleep apnea syndrome, especially if there is no symptom improvement using standard therapy. Imaging techniques are gold standard for the diagnosis of cardiac tumors and surgical extraction is the therapy of choice.

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