CASE REPORT

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Giant intrapericardial lipoma: clinical and forensic implications

Veliki intraperikardni lipom: kliničke i forenzičke implikacije

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Abstract

Introduction. Even though lipomas are the most common benign tumors, they are rarely found in the pericardial cavity. Although histopathologically benign, they can cause life-threatening complications by rapid growth and may therefore be clinically considered malignant. **Case report.** We present an 80-year-old female who was injured during a syncopal episode when falling from a standing height and suffered bodily injuries for which she was hospitalized. In the further course of her short-term hospital treatment, death occurred, and the cause of death was marked as "unknown". At the autopsy, a dilated and tense pericardium filling up a large part of the chest cavity was noted. A well-encapsulated soft tissue mass, 20 × 18 × 3 cm in size, weighing 820 g, was visualized in the pericardial cavity. Histopathological examination revealed that the mass was a lipoma and showed acute myocardial necrosis; therefore, it was assumed that the cause of death was probably due to the compression of lipoma on coronary arteries. **Conclusion.** Even though intrapericardial lipomas are benign tumors, they can cause life-threatening complications and sudden cardiac death. There are numerous diagnostic methods capable of detecting intrapericardial lipomas, and with timely treatment, the patient can be cured.

Key words:
autopsy; cause of death; diagnosis; lipoma; myocardial infarction; pericardium; syncope.

Apstrakt

Uvod. Lipomi su najčešći benigni tumori, ali su retko lokalizovani u perikardnoj šupljini. Mada benigni po svojim patohistološkim karakteristikama, zbog ubrzanog rasta i posledičnih komplikacija koje mogu ugroziti život, mogu se klinički smatrati malignim. **Prikaz bolesnika.** Prikazana je 80-godišnja žena, koja je nakon epizode sinkope, pri padu sa sopstvene visine, zadobila telesne povrede zbog kojih je hospitalizovana. U daljem toku kratkotrajnog bolničkog lečenja nastupio je smrtni ishod, a uzrok smrti označen je kao „nepoznat". Obdukcijom je utvrđen uvećan i napet perikard, koji je ispunjavao značajan deo grudne duplje. Dobro inkapsulirana tkivna masa dimenzija 20 × 18 × 3 cm, težine 820 g, uočena je intraperikardno. Histopatološkom analizom pokazano je da je uočena promena lipom, a na srčanom mišiću uočeni su znaci akutne nekroze miokarda, na osnovu čega je pretpostavljeno da je infarkt miokarda najverovatnije nastao kao posledica pritiska lipoma na koronarne arterije. **Zaključak.** Intraperikardni lipomi mogu biti maligni po lokalizaciji i dovesti do iznenadne srčane smrti. Postoje različite dijagnostičke metode pomoću kojih je moguće otkrivanje intraperikardnih lipoma, a pravovremenom intervencijom bolesnik može biti izlečen.

Ključne reči:
autopsija; smrt, uzrok; dijagnoza; lipom; infarkt miokarda; perikard; sinkopa.

Introduction

Primary pericardial tumors are rare, with an estimated prevalence of 0.00–0.007% [1]. These tumors can be benign (teratoma, fibroma, angioma, lipoma) or malignant (mesothelioma, sarcoma) [2]. Lipomas are the most common benign tumors usually seen in the subcutaneous tissue but may also be deep-seated. They are infrequently seen in the thoracic cavity and even less frequently in the pericardial cavity [3, 4]. Cardiac lipomas can originate from the subendocardium, subpericardium, or myocardium [5]. Lipomas usually grow slowly, and patients may remain asymptomatic for many years. Therefore, most intrapericardial lipomas are detected as accidental findings during an autopsy [6]. Lipomas can be diagnosed using noninvasive imaging methods such as echocardiography, computed tomography, or magnetic resonance.

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If diagnosed, lipomas are usually in the advanced stage of development and present as extremely large masses that, if not asymptomatic, cause symptoms including effort angina, fatigue, atrial arrhythmias (by compressing the coronary arteries), and dyspnea (by tamponade) [7, 8].

Herein, we present a rare case of cardiac death caused by compression of intrapericardial lipoma on coronary arteries.

Case report

We present an 80-year-old female who was injured when falling from a standing height after experiencing a syncopal episode. On admission to the secondary care hospital, she presented with dizziness, breathlessness, and chest pain. She had a history of hypertension. The main finding on physical examination was systolic ejection murmur grade III/VI, while the rest of the examination was unremarkable. The electrocardiogram (ECG) revealed sinus rhythm, 90 beats per minute, and left ventricle hypertrophy with secondary repolarization abnormalities. Focus transthoracic echocardiogram (TTE) showed concentric left ventricle hypertrophy, nonsevere aortic stenosis, and preserved ejection fraction (65%), with no revealed pericardial mass or effusion.

On the second day after admission, she suddenly deteriorated. Initial ECG showed atrioventricular dissociation that progressed to cardiopulmonary arrest. Following unsuccessful resuscitation attempts, she was pronounced dead.

The patient was of average osteomuscular build, with a body mass index of 24 kg/m^2. During the autopsy, an external examination revealed multiple bruises, excoriations, and superficial lacerations on the left side of the face. During the internal examination of the thorax, a dilated pericardium filling up a large part of the chest cavity was noted (Figure 1).

A well-encapsulated soft tissue mass, 20 × 18 × 3 cm in size, weighing 820 g was observed in the pericardial cavity (Figure 2).

The mass was free in the pericardial sack, located behind the left auricle, and connected with a vascular peduncle to the left atrium (Figure 3).

The heart itself weighed 460 g. The left ventricular wall was 16 mm thick, and the aortic valve was stenotic, with a ring circumference of 6 cm. An ischemic area, 2 × 2 cm in size, was noted in the interventricular septum (IVS), and it was observed that the anterolateral papillary muscle (ALPM) was pale, with hemorrhages. The three major coronary arteries had numerous atherosclerotic plaques that were calcified in some parts. The level of their stenosis was approximately 60%. Other macroscopic findings were unremarkable. Histopathological examination revealed that the tumor mass was a lipoma composed of mature fat cells (Figure 4).

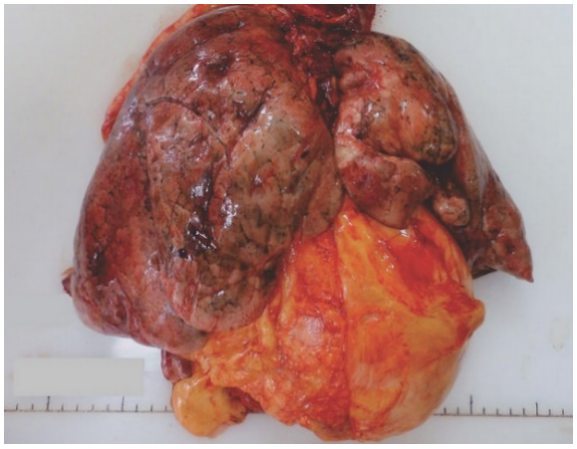

Fig. 1 – Dilated pericardium filling up a large part of the chest cavity.

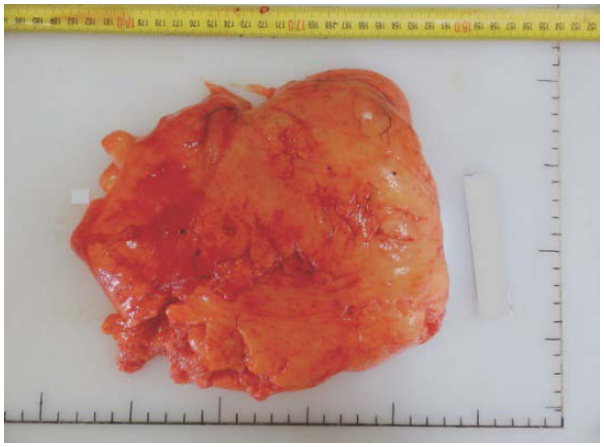

Fig. 2 – Well-encapsulated soft tissue mass in the pericardium.

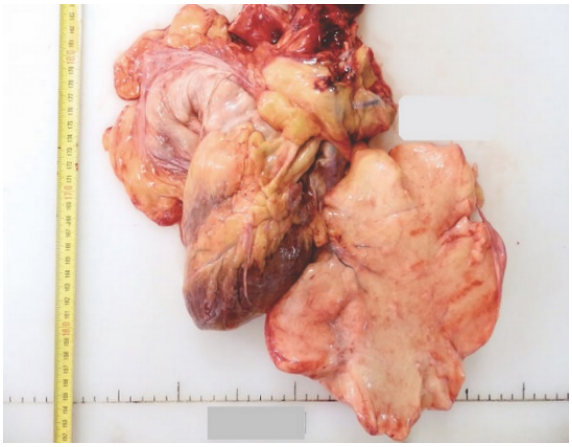

Fig. 3 – Free tumor in the pericardial sack, connected to the left atrium, just behind the auricula by a vascular peduncle.

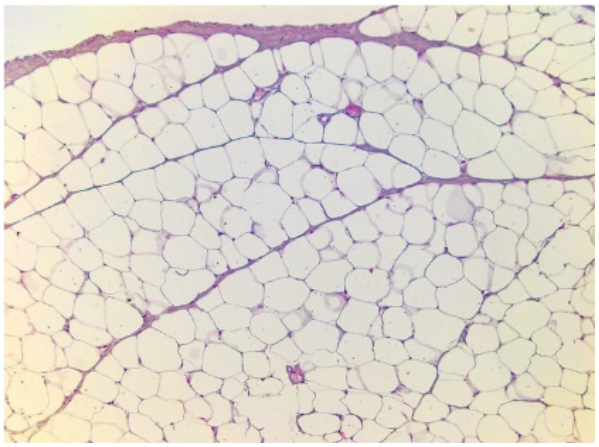

Fig. 4 – Histological appearance of the intrapericardial lipoma: mature fat cells (hematoxylin-eosin, ×40).

The heart tissue showed acute ischemia. Therefore, we concluded that the cause of death was myocardial infarction (MI), probably due to the compression of lipoma on coronary arteries.

Discussion

In our opinion, the most important autopsy findings were macroscopic and microscopic findings on the heart and pericardium. The examination of the pericardium showed a well-encapsulated lipoma located behind the left auricle and connected with a vascular peduncle to the left atrium. Furthermore, the aortic stenosis, as well as the stenosis of coronary arteries, were observed, but individually, they were not severe enough to cause the death of the patient. Therefore, it was assumed that the cause of death was MI, probably due to the compression of lipoma on coronary arteries. This hypothesis is encouraged by the fact that an ischemic area in the IVS, as well as ischemia of the ALPM, were noted. It is well-known that the left anterior descending artery (LAD), through its branches, provides blood supply for a major part of the left ventricular myocardium, as well as the anterior and mid thirds of the IVS [9]. Its first diagonal branch provides blood for ALPM [10], while the anterior part of the IVS obtains blood from the septal branches of the LAD [9]. Bearing in mind the anatomic location of the mentioned blood vessels, in addition to the location of the lipoma, there is a strong possibility that the compression of these arteries caused by the tumor mass leads to the ischemia of the IVS and ALPM.

On the other hand, the question arises whether the pressure of the intrapericardial lipoma was enough to completely stop the blood flow through the coronary arteries and cause myocardial necrosis. We speculate that, in this case, aortic stenosis was a significant contributing factor. As previously mentioned, aortic stenosis was probably not severe enough to individually cause myocardial ischemia. Nevertheless, patients with aortic stenosis are susceptible to myocardial ischemia due to increased metabolic demands of the hypertrophic myocardium, which, in case of decreased blood supply, could have been contributing factor for myocardial ischemia [11, 12]. Although the ischemic zone was not extensive, we hypothesize that the alteration of metabolism in cardiac myocytes caused by the ischemia leads to malignant ventricular arrhythmia and sudden cardiac death.

MI with nonobstructive coronary arteries (MINOCA) is an uncommon but well-documented phenomenon, and one of the potential causes includes external compression of the coronary arteries. However, reports of extrinsic compression of epicardial coronary arteries are uncommon. Gue et al. [13] presented a case of a 44-year-old patient with MINOCA due to compression of coronary arteries caused by the enlarged mediastinal lymph nodes in Hodgkin lymphoma. Aggarwala et al. [14] showed the case of a 71-year-old female patient who presented with findings suggestive of an acute MI due to extrinsic cardiac mass encasing the left circumflex and right coronary arteries (RCA), which caused compression and spasticity of the RCA. However, there are no reports in the literature focusing on cases with similar clinical presentation in patients with intrapericardial lipoma.

Although being the first-choice method in identifying intrapericardial masses, the diagnostic value of echocardiography has its shortcomings. Transesophageal echocardiogram (TEE) can provide more accurate imaging than TTE, but either TTE or TEE is insufficient to distinguish pericardial adipose tissue from lipoma. Therefore, additional computed tomography or magnetic resonance imaging is often needed since they are able to give a more comprehensive view of the structure and its origin [15, 16]. In this case, even though the lipoma was very large, it was neglected with the TTE exam. The possible explanation might be the lack of time for a detailed examination since the TTE examination was performed in the emergency room shortly after the syncopal episode. However, some case reports describe a successful diagnosis of cardiac lipoma using TTE [17]. Therefore, bearing in mind its low price and availability, TTE should be the first-line examination for suspect cardiac lipoma.

Neoplasms, either primary cardiac tumors such as pericardial lipoma or metastatic disease, are a rare cause of extrinsic compression of coronary arteries; therefore, there is a paucity of papers focusing on their clinical effects [14]. That is why they are often neglected by clinicians. However, as we have shown, they can lead to a fatal outcome; thus, considering pericardial tumors in patients presenting with chest pain and no sign of coronary artery disease is essential for establishing the diagnosis and initiating appropriate treatment.

Conclusion

Even though intrapericardial tumors are often histopathologically benign, they can cause life-threatening complications and sudden cardiac death. However, these tumors are seldom considered and often overlooked and mistreated. There are numerous diagnostic methods capable of revealing them; therefore, careful examination of the patient is always required because, with adequate diagnosis and timely treatment, the majority of these patients can be cured.

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