

A Curious Case of Needle Embolism to the Heart in a Former Addict: Cardiac Tamponade Ten Years after the Last Use of Injective Drugs

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Abstract

Cardiac needle embolism is a rare condition. We present the rare case of a 47-year-old man with a history of intravenous drug use. He developed pleuro-pericarditis, but after a few days the patient became clinically unstable and a CT scan revealed a needle embedded in the right ventricular wall.

Keywords: Needle embolism; Cardiac tamponade; Chest pain; Drug user.

Abbreviations: CT: Computerized Tomography; IV: Intravenous; EKG: Electrocardiography.

Introduction

Migration of a foreign body to the heart is a rare cause of chest pain in adult patients. Various clinical manifestations have been described in the literature, such as pericarditis and pleuritis, empyema and pneumothorax, or urgent presentation which may require a surgical treatment like haemopericardium and cardiac tamponade, endocarditis determining valve damage [1]. Different types of foreign body and a variety of ways to reach the heart have been described; the most common are direct or iatrogenic implantation due to local trauma, intravenous migration from another site, inhalation or may remain in the heart after medical procedure [2-5]. The diagnosis can be made with different imaging modalities: radiography, computerized tomography and

echocardiography are main diagnostic modalities. Foreign body can be managed conservatively, percutaneously or can be surgically removed. Treatment of this rare condition is mainly based on clinical experience and this difficult decision should be made by a multidisciplinary team. We present the case of an adult intravenous drug user who developed pericarditis with subsequent cardiac tamponade, caused by embolization of a needle from the femoral vein into his right ventricle with perforation of the free wall (Central picture).

Case report

A 47-year-old male smoker with a history of Intravenous (IV) drug use was admitted to the emergency department with chest pain and dyspnea for three days. The patient had a history of In-

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travenous (IV) drug use that started at the age of 25 and continued over the next 12 years, after attending a rehabilitation clinic and being managed by drug support services. Electrocardiography (ECG) showed diffuse ST segment elevation, chest X-ray showed mild pleural effusion and vascular congestion, transthoracic echocardiography showed mild to moderate haemopericardium, no valvular disease, normal size and preserved systolic and diastolic function of both ventricles, no evidence of a foreign body in the heart or pericardium. No CT-scan was initially performed.

Initially, post-viral pleuro-pericarditis was thought to be present, so the patient was hospitalized and treated with anti-inflammatory therapy (ibuprofen 600 mg three times daily and colchicine 1 mg daily). At that time, the patient was taking Rivaroxaban due to deep vein thrombosis diagnosed a few weeks earlier. During hospitalization, the patient remained clinically stable and the last transthoracic echocardiography showed a regressive pericardial effusion.

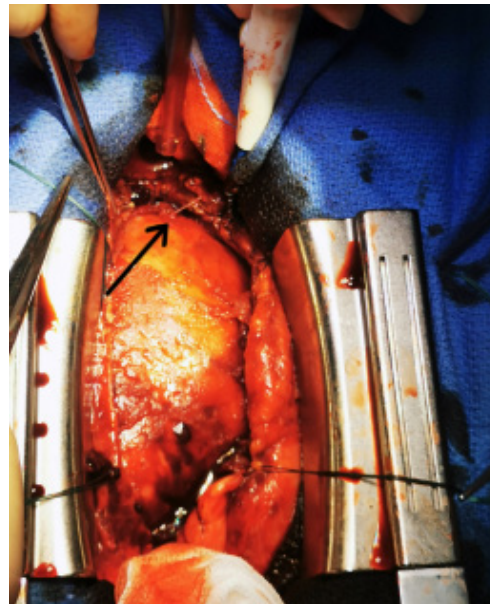
For all these reasons, the patient was discharged home after five days of medical therapy and clinical observation.

The next day he suffered a syncope and a chest pain attack and was then readmitted to the spoke center. Blood pressure was low, diaphoresis was evident, cardiac sounds were distant and attenuated but no murmurs were detected. The clinical signs were suggestive of cardiac tamponade. He was admitted during the night and there were no sonographers' cardiologists at the spoke center, reason why a CT scan was performed, which confirmed the suspicion and showed the presence of a thin metallic object resembling a needle embedded in the right ventricular wall (Figure 1).

There was no way to drain the pericardial effusion immediately in the spoke center, either percutaneously or openly; instead, the patient was immediately referred to our hub center and, in consultation with our angiologist, a prothrombin complex concentrate was administered in the spoke center to prevent major bleeding.

The patient arrived directly in the operating theatre half an hour after the call to the cardiac surgeon. Due to the patient's life-threatening condition and the high risk of recurrence, it was decided to proceed with surgical drainage and needle removal. On arrival, the patient was obviously in a critical condition, with oliguria and metabolic acidosis. A sternotomy was preferred over a subxiphoid approach, due to the needle in place and recent use of anticoagulant. An emergency median sternotomy and pericardial opening with pressurised blood drainage was performed. The needle was found and removed immediately. No suturing was required. The tip of the perforator exited the right ventricle cavity and perforated the free ventricle wall (Figure 2). The pericardium was copiously irrigated; the pleural effusions were also drained and four chest drains were placed. The chest was properly closed. The procedure was performed with a pump on standby.

After the operation, the patient confirmed that ten years before the current event, three needles had broken off near his femoral vessels, which he had a vascular surgeon monitor with ultrasound at the spoke center. Immediately after surgery we performed a toxicology screening with negative result. A full body CT had never been done before to look for more needles and it



Central picture: Intraoperative aspect of the needle perforating the right ventricular wall.

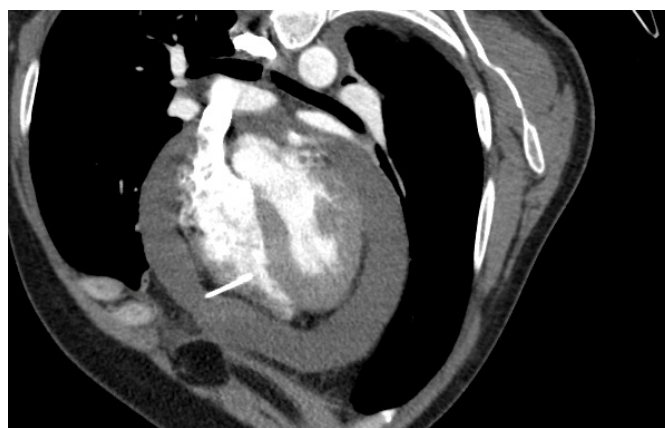


Figure 1: Preoperative computerised tomography showing the presence of a needle perforating the right ventricle wall.

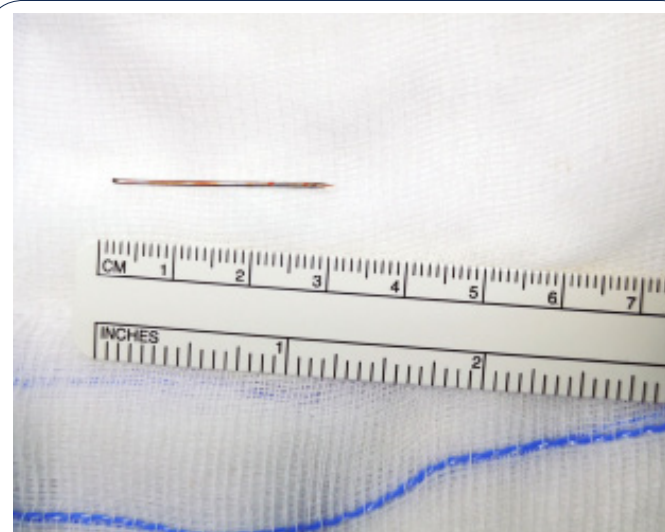


Figure 2: The needle after its surgical removal.

was never decided to remove them because the needles were in difficult positions, one very deep near the great femur trochanter and the other two near the femoral vein. After the operation, a full body examination CT was done to confirm the position of the needles.

The man recovered without problems and could be discharged home.

Discussion

Needle embolism after IV drug use has already been described [3]. In these cases, diagnosis can be difficult as the most common symptoms are chest pain and dyspnea, but ECG and echocardiographic changes are not always present. It is very important to take a detailed history of the patient, always considering the possibility of needle embolism in patients with a history of IV drug use and chest pain [3,4]. In our experience, we were unaware of the time of drug abuse, the direction of the needle, and the presence of two other needles near the patient's femoral vein at the time of surgery. In fact, during the operation we noted the direction of the needle from the inside of the ventricle to the outside, so we suspect that the needle may have migrated from another location.

There are no guidelines to support the removal of foreign bodies from the heart, either in symptomatic or asymptomatic patients, and the best strategy (removal or wait and see) is still debated. The most common approach is surgical, but the literature also describes some cases that were treated conservatively [1]. In this particular case, the conservative approach was not feasible due to the rapidly deteriorating critical condition of the patient. As we experienced in this case, the clinical picture can change very rapidly, evolving from pericarditis to cardiac tamponade within a few days, which is certainly favored by the use of anticoagulants. Considering this rare but life-threatening situation, it is advisable to electively remove any known foreign body before it can migrate, thus preventing such a serious complication, which can even lead to the patient's exitus.

Conclusion

The literature describes surgical removal as a difficult decision and not always necessary, for example, when the needle is in a stable and nonthreatening position and the patient is hemodynamically stable. The management of this rare condition and the decision between surgical removal or conservative treatment such as pericardiocentesis or medical therapy is a difficult decision that should be made by a multidisciplinary team.

Learning objectives

1. To identify an appropriate diagnostic and therapeutic course in case of foreign body in the heart.
2. To recognize the importance of chest CT in cases of chest pain in the absence of a clear diagnosis.

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