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Case Report

Intracardiac foreign body mimicking coronary artery disease: a case report

Yulong Tang, Jian Xiu, Jinxia Han

Department of Cardiac Care, Daqing Oilfield General Hospital, Daqing 163411, Heilongjiang, China

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Abstract: Intracardiac foreign bodies are a rare condition with a varied clinical presentation. The most common etiology is venous migration of endovascular objects so symptoms can develop months or even years after inoculation. We present the case of 56-year-old male with post-exertional angina. The patient was suspected to have coronary artery disease revealed but subsequent coronary angiography revealed a ~5 cm long foreign body that had pierced the ventricular wall. The foreign body was successfully removed with open surgery. We discuss different imaging techniques that may be helpful in the diagnosis of cardiac foreign bodies and surgical management of these cases.

Keywords: Thoracalgia, coronary artery disease, intracardiac foreign body

Case report

A 56-year-old man was admitted for repeated episodes of chest pain in the precordial area following exertion over the preceding 10 days. The patient reported that the pain did not radiate and was relieved by rest. The patient had no history of hypertension or diabetes mellitus. The patient denied any instances of nausea, vomiting, abdominal pain, diarrhea, or syncope. Upon examination, that patient had a temperature of 36.2°C, heart rate of 62 beats per min, respiratory rate of 20, and blood pressure of 159/84 mmHg. Auscultation of the lungs and heart were unremarkable.

Echocardiography showed an ejection fraction of 66%, slight enlargement of the left atrium, a normal sized left ventricle, minimal thickening of the left ventricular wall, and widening of the ascending aorta. Blood chemistry showed elevated alanine aminotransferase (85 U/L), gamma-glutamyl transferase (149 U/L), and triglyceride 712 mg/dL-all remaining values were within normal limits. The patient was initially believed to have coronary artery disease and was started on aspirin, clopidogrel, atorvastatin, and nifedipine. Subsequent coronary artery angiography found no evidence of stenosis, however a ~4 cm linear hyperdensity was observed in the anterior wall of the pericardium. 3D-CT reconstruction showed a ~5 cm high-density object anterior to the ascending aorta, with radiating artifacts, running from the upper-right to the lower-left. The object had an unclear relationship with the wall of the right ventricle (**Figure 1**).

Open surgery was performed to remove the foreign body. During the procedure, a ~5 cm metal strip was identified at the root of the aorta, about 2 cm adjacent to the opening of the right coronary artery. The metal object pierced the anterior wall of the right ventricle through the aortopulmonary window. The foreign body was safely removed (**Figure 2**). The patient recovered without complication and was discharged 6 days postoperatively. The patient later admitted to having a hobby of whipcracking.

Discussion

Foreign bodies in the heart are a rare clinical condition with a variety of possible etiologies. A recent review by Leitman and Vered found that the majority of these cases are due to migration of peripherally inserted foreign bodies through the venous system, most notably vena cava filters and intravenous catheters [1]. However, traumatic injuries with direct penetration

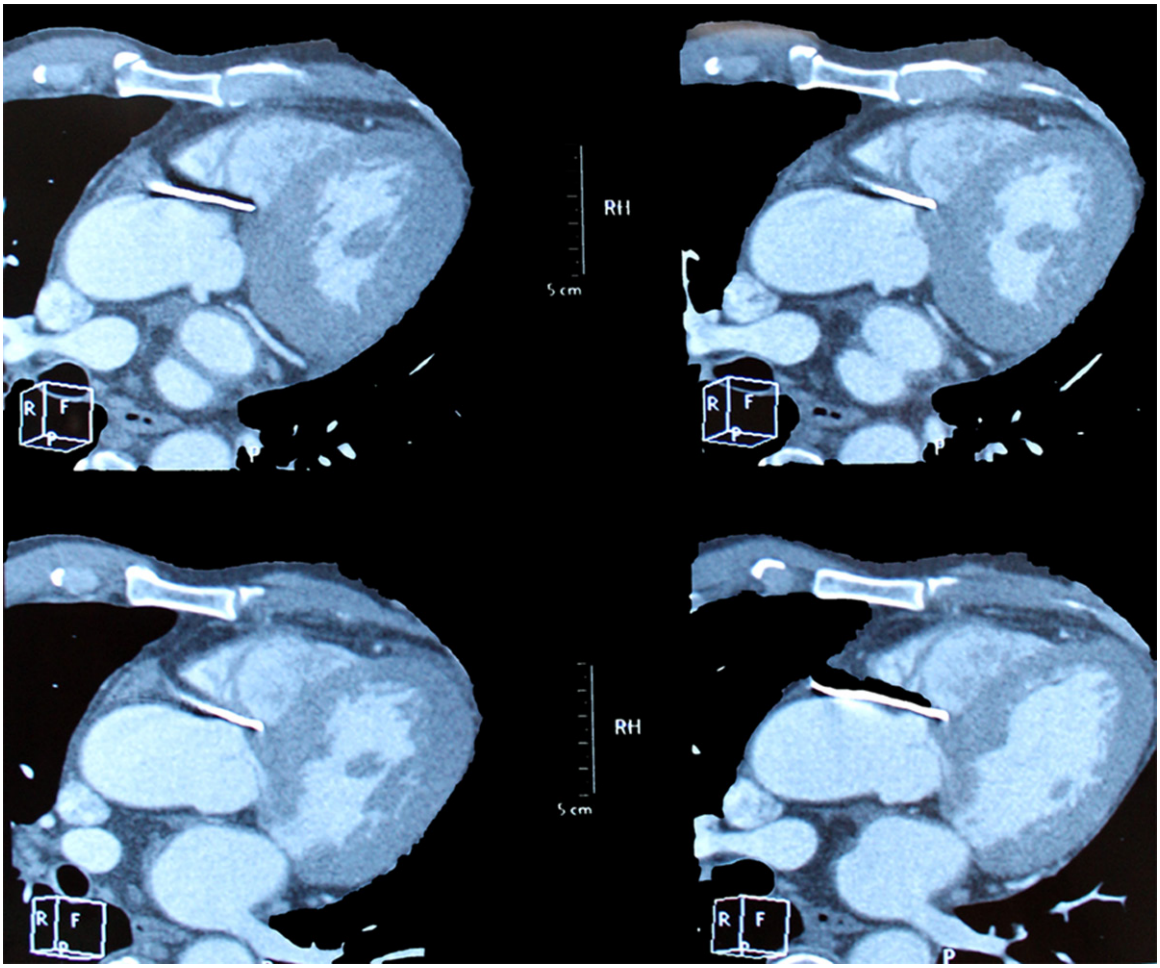

Figure 1. CT showing a ~5 cm high-density object anterior to the ascending aorta, with radiating artifacts, running from the upper-right to the lower-left.

through the chest wall are possible [2]. The patient reported herein had no clear history of trauma or major intravascular procedures and the only suggestive risk factor was the patient's hobby of whipcracking. Approximately 50% of cases present with symptom onset at more than 6 months after the suspected injury, and it is thus often difficult to find a clear origin for the foreign body. Clinical manifestations can be roughly divided into early and late onset. The most common symptoms of early onset are cardiac rupture or perforation with a significant incidence of hemorrhagic shock and cardiac tamponade resulting in death before hospital admission. The most common symptoms of late onset are dyspnea, chest pain, and arrhythmias, however a wide variety of symptoms may arise including heat murmur, infection, ventricular wall aneurysm, thrombosis, or pericarditis [2, 3]. Small foreign bodies may be completely asymptomatic and can be found incidentally on chest radiography or fluoroscopy.

Once the presence of a foreign body is suspected, diagnosis is generally not difficult to establish with first line imaging techniques including chest radiography and echocardiography. Echocardiography is of especially great clinical value because of its noninvasiveness, wide availability, ease of use, and high sensitivity. Moreover, it allows for routine cardiac examination and it can highlight potential mitigating factors including pericardial effusion, thrombus, infective endocarditis, and aortic or ventricular wall damage. However, with this technique smaller non-metal or radiopaque objects can be easily overlooked or confused with normal heart structures or ventricular wall hypertrophy [4]. Therefore, we believe that chest CT should be considered in all suspected cases of cardiac

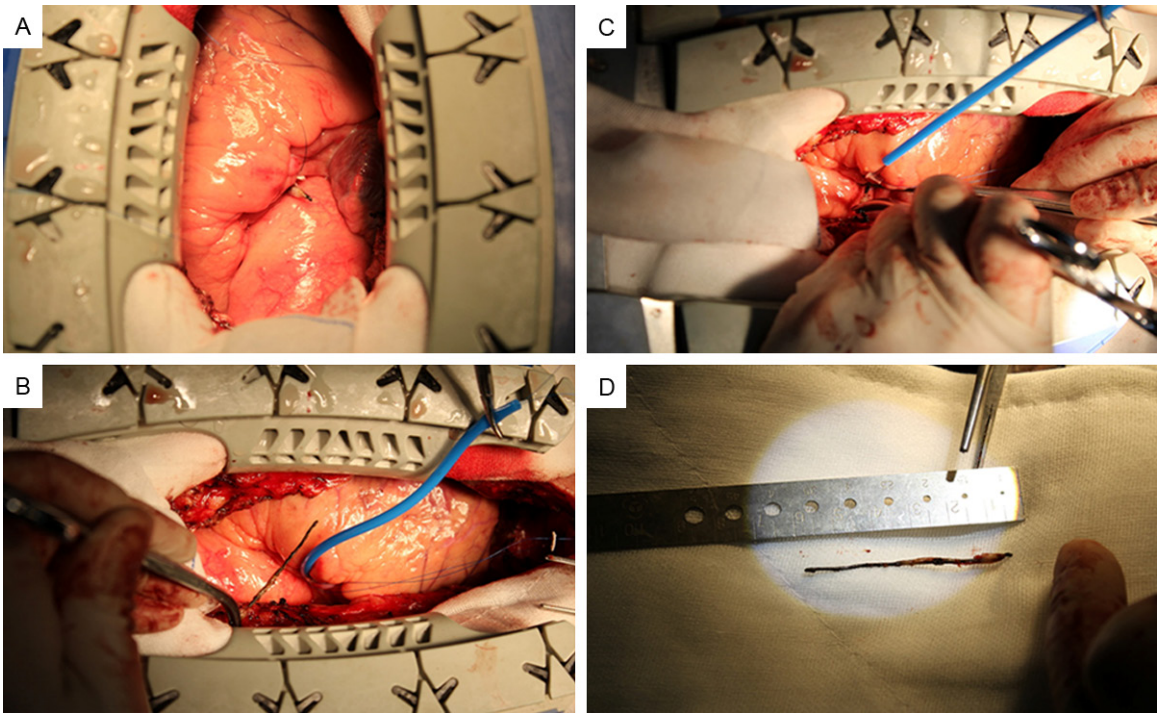

Figure 2. A-C. Intraoperative photos showing identification and removal of the foreign body from the root of the aorta, approximately 2 cm adjacent to the opening of the right coronary artery. D. The extracted object was measured at approximately 5 cm in length.

foreign body as it reduces the potential for false negatives and allows for better understanding of object's position and its relationship with adjacent structures.

Transesophageal echocardiography can also be useful for assessing foreign bodies located more posteriorly, or in the proximal or distal aorta, as it provides better spatial discrimination when compared with standard transthoracic echocardiography-while providing the ability for intraoperative monitoring [3].

Patients presenting with significant bleeding and signs of shock or pericardial tamponade should be treated with immediate fluid resuscitation and emergency surgery with cardiopulmonary bypass in order to release the pressure, facilitate bleeding control, and allow for safe removal. When symptoms have a more gradual onset and the condition is stable, elective surgery can be scheduled. Lundi et al. proposed a classification of major and minor indications for foreign object retrieval that can be useful in clinical decision making [5].

Conservative treatment of small asymptomatic cardiac foreign bodies remains controversial because of the significant risk of migration and subsequent heart injury. Multi-modality imaging should be obtained in these cases and the risk of complications should be carefully weighed against the risk of the surgical intervention in order to determine the optimal course of treatment [3].

Cardiac foreign bodies are challenging clinical entities with varied manifestations that all surgeons should be aware of.

Disclosure of conflict of interest

None.

Address correspondence to: Dr. Yulong Tang, Department of Cardiac Care, Daqing Oilfield General Hospital, No. 9, Zhongkang Street, Sartu District, Daqing 163411, Heilongjiang, China. Tel: +86-13634661388; Fax: +86-459-5805999; E-mail: wangp_8@yeah.net

References

[1] Pan GZ, Bastidas JG, Hasaniya NW, Floridia R. Bullet embolization from an aorto-caval fistula to the heart. Interact Cardiovasc Thorac Surg 2013; 16: 710-711.

[2] Leitman M, Vered Z. Foreign Bodies in the Heart. Echocardiography 2015; 32: 365-371.
[3] Wang X, Zhao X, Du D, Xiang X. Management of metallic foreign bodies in the heart. J Card Surg 2012; 27: 704-706.
[4] Kim D, Yang PS, Choi JH, Seo J, Chun KH, Lee SE, Hong GR, Joo HC, Choi D. Metallic Foreign Body in Heart Mimicking Moderator Band. Yonsei Med J 2015; 56: 867-870.
[5] Lundy JB, Johnson EK, Seery JM, Pham T, Frizzi JD, Chasen AB. Conservative management of retained cardiac missiles: case report and literature review. J Surg Educ 2009; 66: 228-235.