



Foreign Body of the Heart

Kalpde Yabancı Cisim

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Abstract

Foreign bodies in the heart is rare and can be life threatening. Early diagnosis and removal are very important. X-ray, computed tomography and echocardiography are the main diagnostic methods. In this article, a 14-year-old male patient who had chest pain for ten days, whose pain increased when lying down for the last two days, and who was found to have a foreign body needle in the heart in the pediatric emergency service is presented. It was learned that the needle was voluntarily inserted by our patient, who was diagnosed with attention deficit hyperactivity syndrome seven years ago and did not follow-up regularly. It was learned that the chest X-ray taken at another hospital 2 days before applying to our hospital was evaluated as normal. The needle that caused lung contusion, right pleural effusion, right ventricular contusion, right coronary artery injury and pericardial effusion was successfully removed by open heart surgery. It is presented to draw attention to the rarity of cases with a foreign body in the heart in the literature and the careful evaluation of the X-rays.

Keywords: Foreign body, heart, needle, child

Öz

Yabancı cisimlerin kalbe girmesi nadir olup, yaşamı tehdit edebilir. Erken teşhis ve çıkarılması çok önemlidir. Röntgen, bilgisayarlı tomografi ve ekokardiyografi başlıca tanı yöntemleridir. Bu yazıda on gündür göğüs ağrısı yakınması olan, son iki gündür uzandığında ağrısı artan ve çocuk acil servisinde kalpte yabancı cisim olarak iğne saptanan 14 yaşındaki erkek olgu sunuldu. İğnenin, yedi yıl önce dikkat eksikliği hiperaktivite sendromu tanısı alan ve takiplerine düzenli gitmeyen olgumuz tarafından kendisine isteyerek batırılmış olduğu öğrenildi. Hastanemize başvurmadan 2 gün önce gittiği klinikte çekilen akciğer grafisinin normal olarak değerlendirildiği öğrenildi. Akciğer kontüzyonu, sağ plevral effüzyon, sağ ventrikülde kontüzyon, sağ koroner arterde yaralanma ve perikardiyal effüzyona neden olan iğne, açık kalp ameliyatı ile başarıyla çıkarıldı. Literatürde kalpte yabancı cisim olan olgularının nadir rastlanması ve çekilen grafilerin dikkatli değerlendirilmesine dikkat çekmek için sunuldu.

Anahtar Kelimeler: Yabancı cisim, kalp, iğne, çocuk

Introduction

Chest pain in children is a common cause of emergency admission and is generally divided into two main groups as traumatic and non-traumatic. The most common source of chest pain due to non-traumatic causes is musculoskeletal diseases, and most of them are not life-threatening. Diseases of the respiratory system, cardiovascular system, gastrointestinal

system, and nervous system can be seen less frequently. The most feared pains of cardiac origin are rarely seen in children.¹ The penetration of foreign bodies into the heart is life-threatening and is very rare. Early diagnosis and removal of them are very important for these rare cases.² Foreign bodies reach the heart in three ways. It may remain in the heart after direct penetration, intravenous migration, or medical procedures. With local penetration, it can be a

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firearm or trauma-induced bullet, shrapnel, needle, etc.³ It is rare for the sewing needle to accidentally penetrate into the heart. The needle can migrate rapidly between tissues and cause serious consequences such as hemopericardium, hemothorax, pneumothorax, and cardiac tamponade.⁴ The main diagnostic methods are X-ray, computed tomography, and echocardiography.³ In this article, a case admitted for chest pain and found to have a needle penetrated as a foreign body in the heart is reported since these kinds of cases are rarely found in the literature.

Case Report

A previously healthy 14-year-old male patient was brought to our pediatric emergency clinic by his family due to chest pain. In his history, it was learned that the chest X-ray taken at a private health center due to the complaint of chest pain lasting for 10 days was normal and the chest pain increased when he was lying down for two days. In his history, it was stated that he had been diagnosed with attention deficit disorder in the 2nd grade of primary school, but he had not used medication and had not been followed up regularly. No significant finding was seen in the family history. On his initial physical examination, the Glasgow Coma score was 15. The patient had no fever, was normotensive, and had an SpO₂ of 97% at room temperature. No trace was detected on the skin of the patient's chest wall. In the respiratory system examination, his both lungs were equally involved in respiration, respiratory sounds were normal, and there was no respiratory distress. In the cardiovascular system examination, heart sounds were normal, S1 and S2 were rhythmic, and S3 was absent. The patient's biochemistry, hemogram, cardiac enzymes, and coagulation parameters were found to be normal. Electrocardiogram revealed normal sinus rhythm. First

of all, posterior-anterior and lateral chest radiographs was taken and the needle was visualized (Figure 1). In bedside echocardiography, a band-shaped hyperechoic area extending to the right ventricle and pericardial fluid without any signs of compression around the right ventricle and right atrium were detected (Figure 2). In order to determine the intrathoracic location of the foreign body, non-contrast thorax computed tomography was performed. Linear density that may belong to the foreign body extending towards the pericardial space in the right paracardiac area and possible contusional ground glass areas in the surrounding lung parenchyma, a mildly high-density appearance reaching 6 mm in thickness at the pericardial level and minimal pleural effusion on the right were detected (Figure 3). The patient, who had a significant increase in pericardial fluid during clinical follow-ups, was taken to the emergency operation by pediatric cardiovascular surgery after excluding surgical contraindications. It was planned to remove the foreign body by open heart surgery under cardiopulmonary bypass. The pericardium was seen to be lacerated by emergency median sternotomy under general anesthesia and approximately 300 cc of hemorrhagic fluid was drained. A 4 cm long needle, which created a focus of bleeding and laceration on the acute margin surface of the right ventricle and the lateral wall of the right coronary artery, was detected. A foreign body was removed. The right ventricle, right coronary artery and pericardium were repaired. The patient was discharged after two days of intensive care and 5 days of hospitalization. He was consulted with a child psychiatrist during his hospitalization. During the psychiatry control, the parents stated that they did not know how the needle entered the body. The patient, on the other hand, said that he pricked the needle because he was angry with his mother. Borderline mental retardation and accompanying

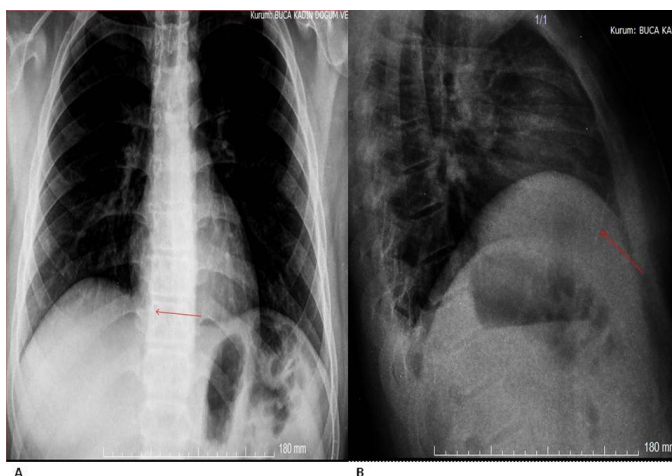


Figure 1. A high-density foreign body superposed on the anterior mediastinum in the area marked with the arrow in the posterior-anterior (A) and lateral (B) chest X-ray images

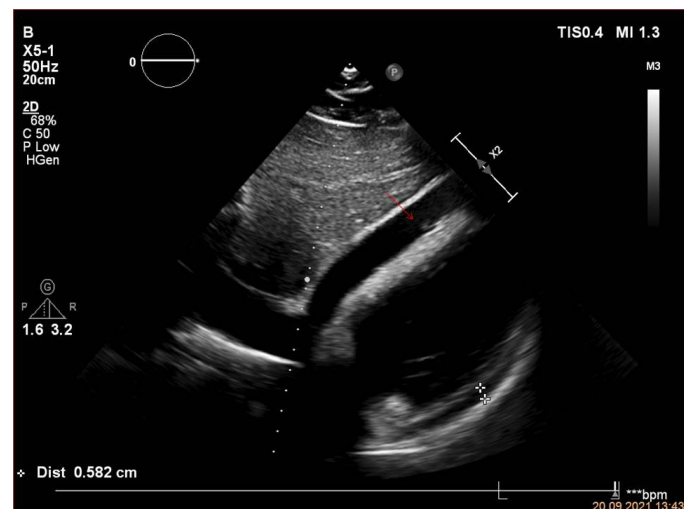


Figure 2. Foreign body in the right ventricle and its acoustic shadow are seen in the area marked with the arrow in the transthoracic echocardiography image

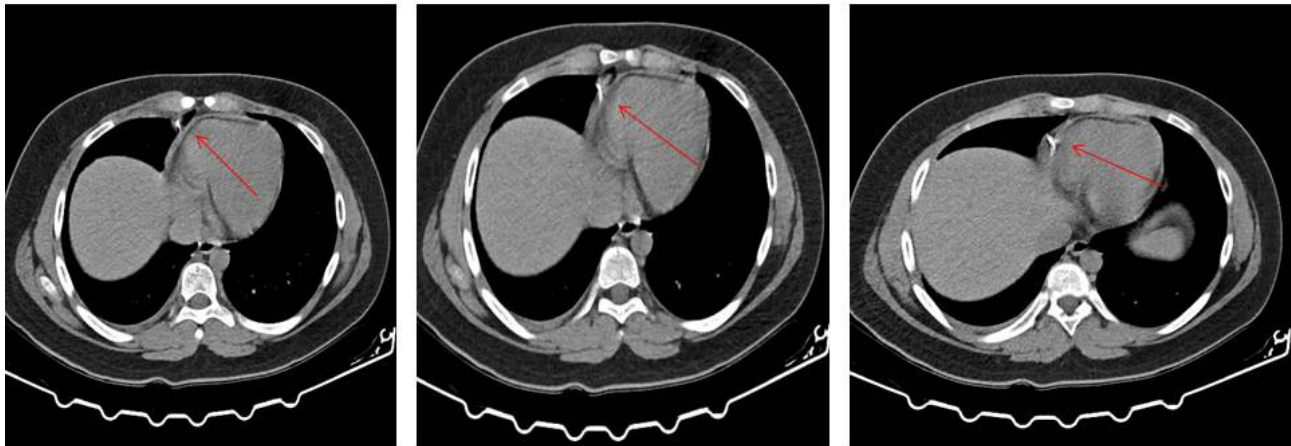


Figure 3. Right pleural effusion indicated by arrow and linear high-density foreign body adjacent to the right ventricle are seen in the heart computed tomography image

adjustment problems were found in the patient. His history of self-harm was deepened and it was determined that it was the first attempt since there were no previous incision marks on the skin. Citalopram 20 mg was started. After discharge, psychiatry and cardiology controls were performed at the 1st week, 1st month, and 2nd month. No sequela was observed in the patient. Written informed consent was obtained from the patient and his family.

Discussion

To the best of our knowledge, penetrating heart injury caused by self-inserted needles is rare.⁵ Foreign bodies in the heart can present with a wide variety of symptoms. Physicians should be aware of these rare complications, which can be fatal. Foreign bodies in the heart are rare, they can reach the heart by accident or traumatic ways. Most reported foreign bodies are catheter fragments or broken guidewires.⁶ Foreign bodies that are self-inserted into the chest wall are usually caused by suicide attempts, mental illnesses, or substance abuse.^{7,8}

If left untreated, it can cause hemothorax due to needle movement, cardiac tamponade and pneumothorax. In addition, thrombus may form and cause repetitive embolization. Rarely, valve insufficiency or infective endocarditis may develop.⁹ Diagnosis of cardiac foreign bodies can be made by radiological examination. Echocardiography is superior to other types of radiological examinations in that it directly visualizes the intracardiac structure, evaluates heart function, and does not contain radiation.⁵ Echocardiography has almost 100% sensitivity in assessing the size, location and mobility of foreign bodies. In the review performed by Soren et al.¹⁰, depression was reported to be the most common psychiatric disorder in 40 cases in the literature, and mental retardation was found in only 2 cases. The most common

presenting symptom was chest pain, as in our case. Unlike our case, intracardiac foreign body is more common in female patients. A single needle was detected in approximately 70% of the cases, and second attempts have been reported very rarely. Most of these patients are treated with surgery. However, mortality has been reported at the rate of 5%.¹⁰ Especially sharp-edged foreign bodies can cause serious complications in the heart, and early removal of the needles is recommended to avoid further damage to the heart. However, there is no consensus on surgical procedures for removing the metallic foreign body in the heart. Foreign bodies can sometimes be directly removed by minimally invasive surgery⁵ or, as in our case, by invasive intervention.¹¹

Conclusion

Foreign bodies in the heart can have fatal consequences. Intracardiac foreign body due to self-injury is mostly seen as a result of psychiatric diseases. Intrathoracic foreign body should be considered in the differential diagnosis of patients who present with chest pain and have or are thought to have an underlying psychiatric disease. In such a case, careful evaluation of the medical history, physical examination, and chest X-ray is very important.

Ethics

Informed Consent: Written informed consent was obtained from the patient and his family.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Concept: G.Y., E.G., E.A., Ü.D., M.B.B., M.A., Design: G.Y., E.G., E.A., Ü.D., M.B.B., M.A., Data Collection or Processing: G.Y., E.G., E.A., Ü.D., M.B.B., M.A., Analysis or Interpretation: G.Y., E.G., E.A., Ü.D., M.B.B., M.A., Literature Search: G.Y., E.G.,

E.A., Ü.D., M.B.B., M.A., Writing: G.Y., E.G., E.A., Ü.D., M.B.B., M.A.

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