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CASE REPORT
Cardiac imaging

A case report of an unusual left atrial mass

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Background Cardiac foreign bodies (FBs) are rare findings that may present as cardiac masses initially. Here, we present an exceptional and rare case of a hypodermic needle FB that transmigrated to the left atrium and presented as a left atrial mass.

Case summary A 28-year-old woman with multiple psychiatric disorders including intentional FB ingestion and self-inflicting injuries presented to the emergency room with abdominal pain, nausea, vomiting, diarrhoea, and chest pain that radiated to the left arm and face for 2 weeks. An echocardiogram was performed revealing a left atrial mass concerning for myxoma. During the surgical removal of the mass, a hypodermic needle was found attached to the roof of the left atrium surrounded by thrombotic and fibrotic tissue, which was confirmed by pathology.

Discussion Cardiac FBs are caused generally by penetrating wounds from direct trauma. Fewer cases have been reported regarding cardiac FB caused by ingestion from migration of the object to the heart. Signs and symptoms for cardiac FB may mimic those of cardiac masses. Cardiac FBs often require surgical intervention to avoid complications.

Keywords Case report • Left atrial mass • Foreign body

Learning points

- Cardiac foreign bodies (FBs) may mimic primary cardiac masses.
- Cardiac FBs not only result from direct penetration but also from transmigration from the gastrointestinal system.

Introduction

Cardiac foreign bodies (FBs) are rare findings caused generally by penetrating wounds from direct trauma to the heart or procedural interventions involving the heart and great vessels.[1] Fewer cases report cardiac FB caused by ingestion, abdominal surgery, or penetration injury of FB from migration of the object into peripheral venous system to the heart. Cardiac FB often requires surgical intervention. Here, we present an exceptional and rare case of a hypodermic needle FB that transmigrated to the left atrium and presented as a left atrial mass.

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Timeline

1 year prior to admission	A witnessed stabbing of hypodermic needle into left internal jugular vein by patient requires retrieval of needle
1 month prior to admission	Patient inserted a number of foreign bodies into a healing abdominal surgical site leading to abscess formation which required surgical management
Admission day	Patient presents with substernal chest pain with associated shortness of breath, nausea, vomiting, and diarrhoea Echo reveals left atrial mass
Day 3 of admission	Removal of left atrial mass reveals organized thrombus and hypodermic needle
Day 6 of admission	Patient discharge from hospital

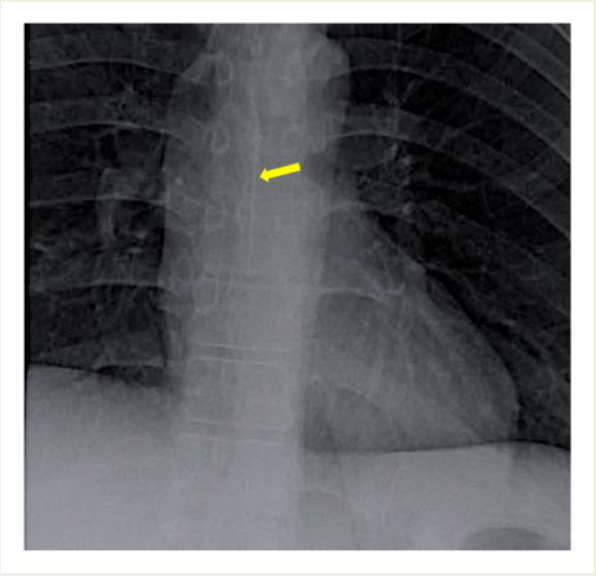

Figure 1 Chest X-ray showing mediastinal metallic density (yellow arrow).

Case presentation

A 28-year-old woman presented from jail to the emergency department with headache, abdominal pain, nausea, vomiting, and watery, bilious diarrhoea for 2 weeks. She also reported substernal chest pain that wrapped around her right chest and radiated down her left arm as well as tingling of her left face. Her chest pain was associated with dyspnoea. Her history was significant for multiple psychiatric and behavioural disorders including intentional FB ingestion as well as self-inflicting injuries. Incidences included admissions for swallowing pins, needles, and soda can tops, inserting FBs in an abdominal surgical incision 1 month ago leading to abscess formation and requiring irrigation and debridement, and witnessed stabbing of hypodermic needle in the left internal jugular vein about a year ago requiring retrieval of the needle by interventional radiology.

In the emergency room, her blood pressure was 135/98 mmHg, respiratory rate was 20 breaths/min, pulse rate was 134 beats/min, and oxygen saturation was 97%. She was afebrile with temperature of 99.1 F (37.3°C). Her physical exam was significant for normal heart sounds, tenderness to the left upper quadrant and two healing wounds with granulation tissue in the right lower quadrant. Because the patient reported concerning chest pain, cardiac enzymes were ordered. Troponin T was 0.797 ng/mL (normal range, 0.00–00.04 ng/mL), creatinine kinase-MB (CK-MB) was 21.6 ng/mL (normal range, <5.0 ng/mL), and total was creatinine kinase (CK) 437 U/L (normal range, 22–195 U/L).

The electrocardiogram showed sinus tachycardia with inferolateral T-wave inversions. Chest X-ray showed a linear density in the mediastinal area concerning for a FB (*Figure 1*). A transthoracic echocardiogram was performed and revealed a 2 cm × 2 cm left atrial mass that appeared attached to the septum without obstructive physiology (*Figure 2A and B*), a mildly enlarged left atrium, preserved ejection fraction of 60%, and normal right heart size and function. The mass was concerning for a left atrial myxoma.

A cardiothoracic surgical consultation recommended the removal of the left atrial mass based on symptoms and risk of embolization. In the context of symptoms and elevated cardiac enzymes, a pre-operative diagnostic coronary angiography was performed. The angiogram showed normal coronaries but also showed a 5 cm long linear finding in the mediastinal area (*Figure 3*). During the surgery, the left atrial mass was visualized. As the surgeons resected the mass, a hypodermic needle was exposed. It appeared to be attached to the roof of the left atrium and surrounded by fibrotic tissue. Surgical pathology described the specimen as tan-grey with areas of pinpoint haemorrhage, and it was identified as an organizing thrombus with focal basophilic debris (*Figure 4*) and 5 cm hypodermic needle.

Her post-operative course was uneventful, and she was discharged 3 days later.

Discussion

Foreign bodies of the heart are rare occurrences and have been documented in case reports and series. They are generally caused by penetrating wounds from direct trauma to the heart or procedural interventions involving the heart and the great vessels.[1] Some cases may be due to intentional penetration, especially in patients with mental health issues, or accidental direct penetration of FB to the heart.[2,3] Very few cases have reported incidental findings of cardiac FBs after ingestion, abdominal surgery or penetration injury to soft tissue theoretically caused by migration of the object into the peripheral venous system to the heart.[4–7]

Symptoms if any, may be similar to cardiac mass, which may include chest pain, radiating pain to the left upper extremity, dyspnoea, and fever.[6–8] Cardiac enzymes may be elevated.[3] Complications in previous reports have mentioned congestive heart failure, pulmonary or systemic embolization, arrhythmias, and cardiac perforation leading to pericardial effusion, cardiac tamponade, or pericarditis.[1,4,9]

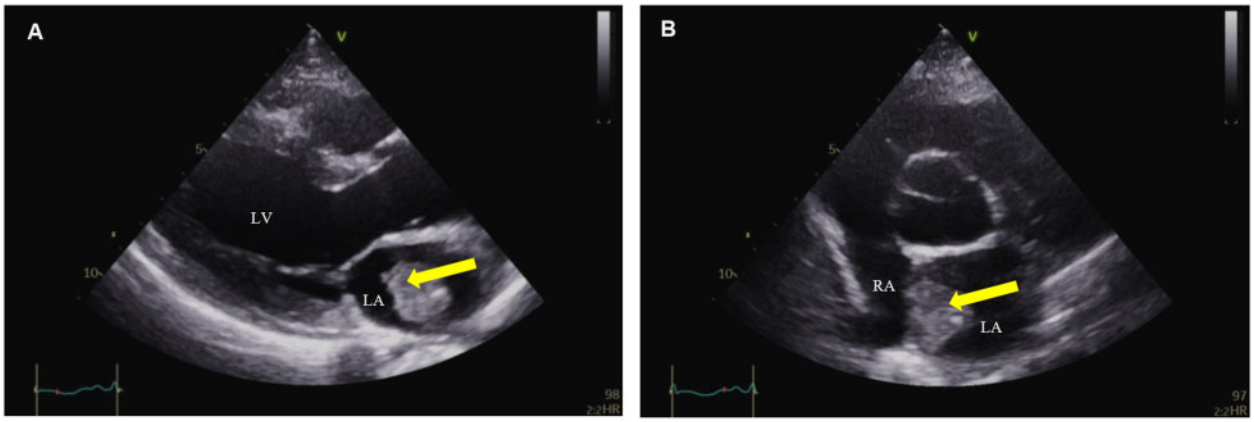

Figure 2 Transthoracic echocardiography finding of a 2 × 2 cm echogenic mass (yellow arrow) noted in left atrium. The mass appears attached to interatrial septum. (*A*) Parasternal long-axis view. (*B*) Parasternal short-axis view. LA, left atrium; LV, left ventricle; RA, right atrium.

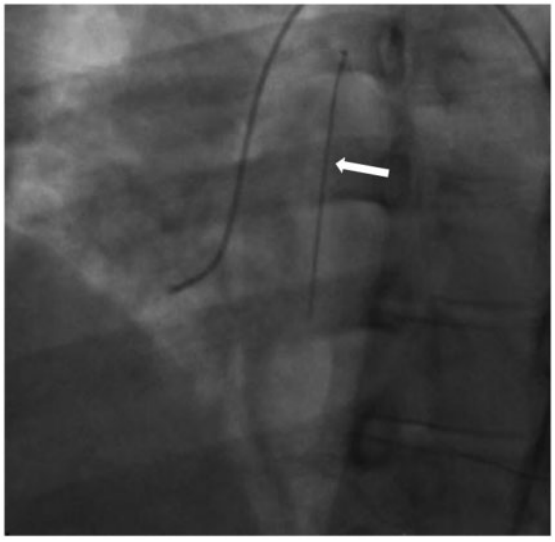

Figure 3 Coronary angiography in left anterior oblique view shows 5 cm linear radio-opaque density in the location of the left atrium (white arrow).

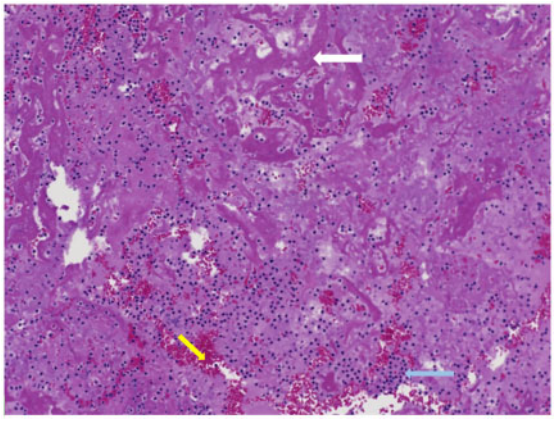

Figure 4 Histopathological findings of the left atrial mass after surgical resection (haematoxylin and eosin staining, high power field). The image shows organizing thrombus with homogenous pink areas representing fibrin material (white arrow), basophilic inflammatory cells (blue arrow), and red blood cells (yellow arrow).

Diagnosis of FB can be based on multi-modality assessment including echocardiogram, chest X-ray, and computed tomography scan. Removal of FB is recommended especially if acutely found or if symptomatic. However, there have been cases in which the object has remained for years without complications.[1,10] If the foreign object is removed, it is sometimes surrounded by thrombotic/fibrotic tissue.

In this case, the patient experienced several admissions to the hospital involving ingesting foreign objects, and during her last admission, she was found to have inserted foreign objects into her healing abdominal wounds. No history was attained of intentional penetration of needles through her chest wall. She experienced chest pain with elevated cardiac enzymes, which may be due to direct myocardial injury from the penetrating needle. Fortunately, no pericardial effusion or tamponade was seen on echocardiogram. Surgical intervention was deemed necessary considering symptoms, the location of the mass with risk of embolization, and finding of a FB in the cardiac area. It was during open heart surgery that the finding of a needle that could have transmigrated to the left heart and settle in the left atrium was appreciated. The finding of clot formation is likely attributable to the presence of a FB in the left atrium.

The mechanism of transmigration of a FB from the gastrointestinal tract to the heart is unclear. We speculate that the needle was briefly wedged in the oesophagus, and due to the peristaltic motion of the oesophagus, the needle transmigrated to left atrium, which anatomically lies anterior to the oesophagus. Since such cases of FB

transmigration to intracardiac chambers are exceedingly rare, the precise mechanisms underlying such transmigration cannot be adequately ascertained.

Lead author biography

Dr Chinelo Udemgba is currently a cardiology fellow at the University of Florida College of Medicine – Jacksonville. Her focus is in non-invasive cardiology including echocardiography, nuclear medicine, and women's health.

Supplementary material

Supplementary material is available at *European Heart Journal - Case Reports* online.

Slide sets: A fully edited slide set detailing this case and suitable for local presentation is available online as Supplementary data.

Consent: The authors confirm that written consent for submission and publication of this case report including images and associated text has been obtained from the patient in line with COPE guidance.

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