



# FOREIGN BODIES OF ATYPICAL PRESENTATION: CASE REPORTS

Cuerpos extraños de presentación atípica:  
Presentación de casos



## Key words (MeSH)

Foreign bodies  
Multidetector computed tomography  
Radiology

## Palabras clave (DeCS)

Cuerpos extraños  
Tomografía computarizada multidetector  
Radiología

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## Summary

**Objective:** To show cases of foreign bodies of unconventional presentation diagnosed incidentally by various types of imaging studies in patients who did not refer and neither complained of a foreign body. **Material and Methods:** images from the archive of the radiology and diagnostic images service department were obtained from patients diagnosed of having a foreign body without a history related to this diagnosis. **Results:** Four clinical cases of patients of different ages are reported in whom foreign body was incidentally found in different anatomical locations and different imaging studies such as radiography and computed tomography. **Conclusions:** The nature of foreign bodies is diverse, being mainly of organic origin (dry wood). The clinical presentation will depend on the size, location and composition of the foreign body. The diagnosis can present several issues because they can present radiographic densities similar to the surrounding tissues. Computed tomography is the study of choice presenting limitations in the detection of foreign bodies of organic origin. In some cases only surgical exploration allows diagnosis and treatment.

## Resumen

**Objetivo:** Presentar casos de cuerpos extraños de manifestación no convencional diagnosticados de manera incidental en distintos tipos de estudios imagenológicos en pacientes que no referían ni mostraban clínica sugestiva de cuerpo extraño. **Material y métodos:** Se analizaron las imágenes en el archivo del servicio de radiología e imágenes diagnósticas de pacientes que acudieron a la Fundación Oftalmológica de Santander —Clínica Carlos Ardila Lülle (FOSCAL)— a quienes se les diagnosticó un cuerpo extraño de manera incidental mediante distintas modalidades de imagen. **Resultados:** Se informa de cuatro casos clínicos de pacientes en quienes se encontró de forma incidental un cuerpo extraño, en diferentes localizaciones anatómicas y distintos estudios imagenológicos, como radiografía y tomografía computarizada. **Conclusiones:** La naturaleza de los cuerpos extraños es diversa; principalmente son de origen vegetal. La clínica dependerá del tamaño, localización y composición del cuerpo extraño. Su diagnóstico es difícil debido a que pueden tener densidades radiográficas similares a los tejidos circundantes. El estudio de elección dependerá siempre de la región y el tejido afectado, así como el material del cuerpo extraño. La

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tomografía computarizada es el estudio de elección; tiene limitaciones en la detección de cuerpos extraños de origen vegetal y en algunos casos solo la exploración quirúrgica permite el diagnóstico y tratamiento.

## 1. Introduction

About one third of foreign bodies go unnoticed during initial examinations, making it necessary to use diagnostic imaging aids in suspected cases (1). Determining the exact location of a foreign body is very important because its removal may be associated with risks for patients. Patients usually consult for transitory symptoms, in a smaller proportion they consult for persistent clinical manifestations or secondary to complications and, in other cases, the foreign body can be found as an incidental finding during a medical procedure. It is usually related to an accidental event; however, in adults the event may be associated with various physiological, anatomical, mechanical, social and psychiatric factors (2). The most common foreign bodies are metal objects, but this also depends on the age group. When a foreign object accidentally enters the body, it may be located in a space filled with air, soft tissue or muscle. Plain radiography is usually the first test for foreign bodies (3); however, this depends on the ability of the material to attenuate the x-rays. Foreign bodies can be visualized depending on their density and proximity to the tissue in which they are embedded (4). A series of cases of foreign bodies of unconventional manifestation, incidentally diagnosed in different types of imaging studies in patients who did not refer to the antecedent, nor showed clinical suggestive of foreign body, are presented.

## 2. Methods

The images in the archive of the Radiology and Diagnostic Imaging Service of patients who attended the Fundación Oftalmológica de Santander, Clínica Carlos Ardila Lülle (FOSCAL), in whom a foreign body was found in a radiographic or tomographic study, were analyzed. The most representative images on the subject were included in the present review and a literature review was performed based on the incidence of presentation by affected tissue, age, foreign body composition, as well as the presentation of secondary complications visible by image.

## 3. Description of the cases

### 3.1 Case 1

6-year-old patient with history of asthma and recurrent pneumonia with no clear etiology. In computed tomography (CT) of the thorax, a high-density, cone-shaped foreign body, corresponding to a toy lollipop, is observed in the carina and ostium of the right source bronchus, partially obstructing the light; in addition, alveolar occupation opacities are observed in the medial segment of the middle lobe, which is triangular in appearance, with a low amount of air bronchiogram. This foreign body was extracted by fibrobronchoscopy (Figure 1).



Figure 1. Coronal tomographic section: high density foreign body is observed in the carina and ostium of the right source bronchus.

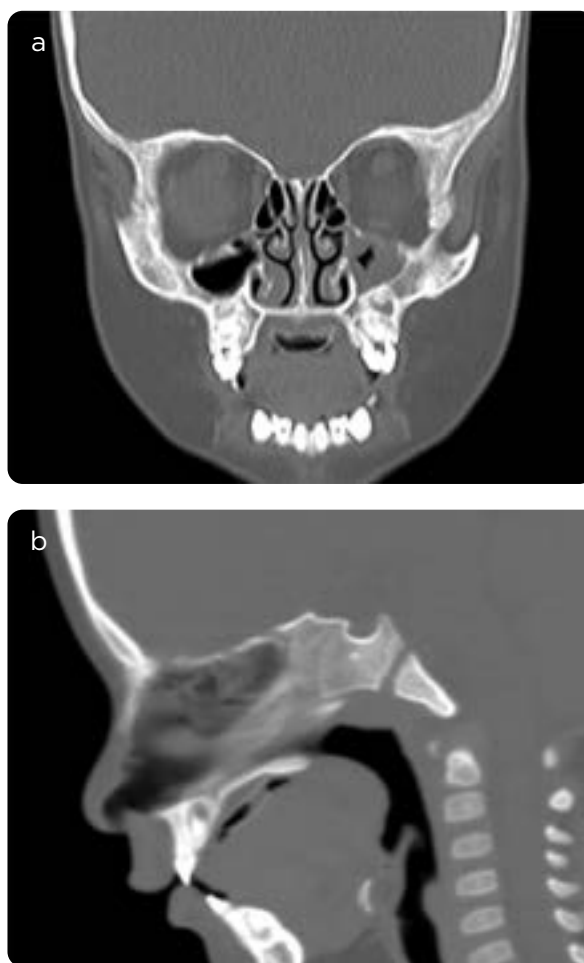


Figure 2. a and b) Coronal and sagittal sinus reconstruction, of the palate: an oval-shaped image with well-defined contours is identified, circumscribed, with a low-density centre of air, trapped inside.

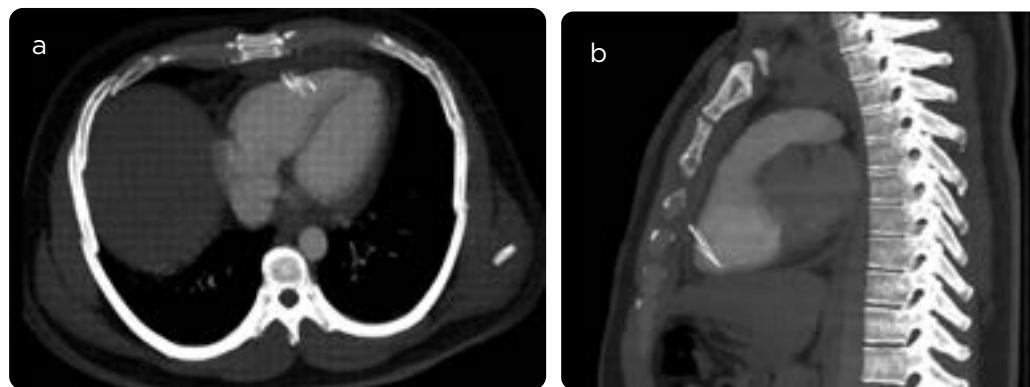


Figure 3. a and b) Axial section and sagittal reconstruction. In the distal third of the sternal body a linear metallic foreign body is observed whose distal end crosses the right ventricle.



Figure 4. Sagittal reconstruction: high density image that is found on the ileum wall and surpasses it (arrow).

### 3.2 Case 2

Female patient of 15 months of age, with a 15-day history characterized by marked hyperoxia and weight loss associated with solid mass in the hard palate. With diagnostic impression of tumor on the palate, a cranial CT scan was performed in which an oval lesion with well-defined contours was identified, circumscribed, with a low-density center (- 577 UH) and high-density edges, suggesting a torus palatinus. It measures 21.1 mm × 3.9 mm × 13.5 mm and is located on the hard palate. By surgical procedure, the patient had a plastic cap removed and inserted into the palate (Figure 2).

### 3.3 Case 3

A 32-year-old patient with a history of precordial pain and sepsis of presumed soft tissue origin, probably related to an abscess of the anterior wall of the left hemithorax. With antibiotic management and study of precordial pain initially considered as acute pericarditis, due to findings of pericardial thickening.

He was in shock, with clinical and echocardiographic signs of cardiac tamponade, so it was necessary to perform an ultrasonographically guided pericardiocentesis, through which 280cm<sup>3</sup> of dark hematic fluid was drained. After the procedure, there was significant clinical and hemodynamic improvement and normalization of perfusion parameters. In the re-evaluation of the case a history of self-inflicted needle lesions was found in the anterior chest (potential suicidal intent difficult to assess due to language disorder

of the patient and the accompanying person). On reviewing the images, a foreign body was found to be accessing from the anterior wall of the left hemithorax into the right ventricular cavity.

The patient's relative reports that the clinical picture began approximately 4 months ago, with the appearance of a small abscess type skin lesion on the anterior wall of the thorax, which increased progressively. In the dorsal face of the distal third of the body of the sternum, a high-density, linear foreign body is identified, which affects the retrosternal fat and generates a metallic artifact. Its distal end crosses the thickness of the anterior face of the right ventricle and reaches the lumen of the same. It is accompanied by a low-density pericardial collection (Figure 3).

### 3.4 Case 4

45-year-old male patient with a two-day clinical picture characterized by colicky abdominal pain at the mesogastrium irradiated to the epigastrium, associated with nausea. Abdominal CT scan identified a high-density, well-defined image that crosses the intestinal wall and reaches the lumen of the loop on the anterior aspect of the distal ileum. A wooden splinter was found in the surgical procedure. Adjacent to the described lesion, increased density of peritoneal fat and some free gas bubbles were observed (Figure 4).

## 4. Discussion

A foreign body is defined as any object that enters the various tissues or cavities of the body. They can be located in the upper digestive tract when accidentally ingested; 80% of cases in the pediatric population. Of those ingested, 90% pass into the digestive tract and 10% into the tracheobronchial tree (5). The foreign body in the airway is predominantly located in the right bronchus and the most frequent symptoms are coughing and wheezing; the most common radiological finding is hyperinflation (49 %), followed by atelectasis (14%), pneumonia (4%) and a normal x-ray in 12% (5), therefore, a normal x-ray does not rule out the presence of a foreign body in the airway. Plain radiography is usually the initial image because of its accuracy in detecting radiopaque objects; however, it has limitations in identifying radiolucent objects and in defining the exact location of these, as occurred in case 1. On the other hand, ultrasound is considered useful in the identification of dry vegetable-type materials, such as processed wood, and also allows adequate visualization of tendons and vascular structures (6). Magnetic resonance imaging (MRI) cannot be used initially in cases of foreign bodies with unknown composition and suspected metallic elements. The magnetic

field can mobilize the foreign body -if it is ferromagnetic- and cause greater damage. Additionally, identification of wooden foreign bodies can be extremely difficult on MRI, especially when they are small and there is not yet abscess formation. In such cases, the foreign body may appear as a signal void with surrounding non-specific granulation tissue (7). Ultrasound has shown high sensitivity and specificity for the visualization of wood due to the markedly different acoustic impedance of wood and soft tissues (8). Dry wood fills with air, absorbs blood products and the surrounding exudate, resulting in increased attenuation. According to studies, the maximum incidence of foreign body ingestion occurs at pediatric age. The objects most frequently involved are game pieces, doll's eyes, clothing buttons, and plastic caps, which are easily identified by CT scans (9); however, no studies reporting the epidemiology of foreign bodies of atypical presentation are found in the literature. The plastic cap has a concave shape that favors its adherence (10). In these cases, when the foreign body has not been diagnosed, tomography is very useful due to the high density and particular shape of the objects. If a foreign body is left in situ for a period of time, the mucous membrane that surrounds it can advance around it and, in extreme cases, grow completely over it, simulating other pathologies. This is what happened in case 2, where the lid on the palate was confused with a torus palatinus (7), since on CT it appears as a bony protrusion with a density similar to that of compact bone. On the other hand, a simple chest x-ray allows the suspicion of the diagnosis and the location of a foreign body in the pericardial sac due to the radiopaque content in the periphery of the cardiac silhouette. When it is presumed that the foreign body is in the myocardium in the cardiac chambers an echocardiogram or a CT scan should be performed (11), this is very useful since it provides information about the other mediastinal and thoracic structures. Penetration of foreign bodies into the heart is rare. Objects usually include bullets, acupuncture needles, fragments of Kirschner wires, venous catheters or, even more rarely, sewing needles. Self-inflicted intracardiac needle injuries are mainly seen in young and middle-aged adults with psychiatric disorders (12). The needle can migrate rapidly through the tissues, which can result in cardiac tamponade, hemothorax, and pneumothorax, as seen in Case 3. Thus, real-time echocardiography is superior to other types of radiological examinations because of the direct visualization of intracardiac structure and the ability to assess cardiac function. In addition, echocardiography has almost 100% sensitivity in assessing the size, location and mobility of intracardiac foreign bodies (13). The foreign body can generate different symptoms depending on the anatomical location. The nature of the foreign body that can reach the gastrointestinal tract is diverse, varying according to age group. Objects ingested by children are mostly metal objects, while in adults fish bones, dentures, needles and toothpicks are more commonly found (2). In most cases the foreign body advances into the intestinal lumen without generating alterations in the gastrointestinal tract; however, 1% of patients suffer complications associated with chronic retention of the objects, such as laceration and perforation, common with sharp or stabbing objects, as described in case 4. In these cases, the radiologist's job is to describe the location of the foreign bodies and the possible complications that could compromise the patient's life, depending on where they are located. In these cases, the radiologist's job is to describe the location of the foreign bodies and the possible complications that could compromise the patient's life, depending on where they are found.

## 5. Conclusions

Proper diagnosis of foreign bodies is very important to avoid the complications they can generate. It is essential to know the nature of the foreign body, since its imaging diagnosis depends on the type of material that makes it up. Despite the many studies on the epidemiology of consultations for foreign bodies, the literature does not contain data on the incidence and prevalence of foreign bodies of atypical presentation. The clinic will depend on the size, location, and composition of the foreign body; the latter makes diagnosis difficult because it may have radiographic densities similar to those of surrounding tissues; however, the study of choice will always depend on the region and tissue affected; as well as on the foreign body material.

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