

Conventional Radiology and Foreign Bodies: Their Current Role

Emmylou Prisca Gabrielle Andrianah^{1*}, Franquine Randrianantenaina¹, Ny Ako Ratsimbasa¹,
Natalia Gordienko², Ny Ony Narindra Lova Hasina Rajaonarison¹, Hasina Dina Ranoharison³,
Ahmad Ahmad¹

¹Department of Medical Imaging, Joseph-Ravoahangy-Andrianavalona University Hospital Center, Antananarivo, Madagascar

²Department of Medical Imaging, Eaubonne Montmorency Hospital Group, Simone Veil Hospital, Paris, France

³Department of Medical Imaging, Andohatapenaka University Hospital Center, Antananarivo, Madagascar

Email: *andrianagabiemmylou@gmail.com

How to cite this paper: Andrianah, E.P.G., Randrianantenaina, F., Ratsimbasa, N.A., Gordienko, N., Rajaonarison, N.O.N.L.H., Rahonarison, H.D. and Ahmad, A. (2025) Conventional Radiology and Foreign Bodies: Their Current Role. *Open Journal of Medical Imaging*, 15, 137-142.

<https://doi.org/10.4236/ojmi.2025.153011>

Received: July 15, 2025

Accepted: August 26, 2025

Published: August 29, 2025

Copyright © 2025 by author(s) and Scientific Research Publishing Inc.

This work is licensed under the Creative Commons Attribution-NonCommercial International License (CC BY-NC 4.0).

<http://creativecommons.org/licenses/by-nc/4.0/>



Open Access

Abstract

Background: Intra-digestive foreign bodies are common and can vary in nature, shape, and number. Complications—especially perforation and superinfection—make them a medical emergency. Abdominal radiography without preparation (plain abdominal X-ray) is commonly prescribed in various situations and remains the first-line imaging method for detecting foreign bodies due to its simplicity and rapid access, providing valuable guidance for therapeutic management. **Objectives:** To describe the prevalence and radiographic appearance of digestive tract foreign bodies and assess the current role of conventional radiology in their detection. **Methods:** A single-center, descriptive retrospective study conducted over a two-year period in the Radiology Department of the Eaubonne Montmorency Hospital Group, Paris, France. The study included all patients who underwent a plain abdominal X-ray following the ingestion or insertion of a foreign body. **Results:** A total of 62 cases of digestive tract foreign bodies were identified on plain abdominal radiographs out of 1977 examinations (3.14%). Males predominated with a sex ratio of 2. Pediatric patients under 10 years of age were the most affected group, with ages ranging from 9 months to 82 years. In 95.2% of cases, the event occurred accidentally, while 4.8% had a history of psychosis. In over 98% of cases, the entry route was ingestion; one case involved anal insertion. Reported symptoms included abdominal pain, vomiting, and odynophagia. All detected foreign bodies were radiopaque and ranged in size from 5 mm to 10 cm. On imaging, most objects appeared rounded, resembling coins (53.2%). The most frequent location was the umbilical region (40.3%). Complications were generally minor, including fecal stasis (69.2%) and aerocolia (69.7%). Spontaneous evacuation through natural routes occurred in 93.5% of patients. **Conclu-**

sion: Foreign bodies in the digestive tract are frequently detected by conventional radiography, particularly in the pediatric population, with boys affected twice as often as girls. Clinical manifestations depend on the location of the object in the digestive tract, and complications vary according to the foreign body's shape, size, and number. Conventional radiography plays a key role in diagnosis by identifying the foreign body's presence, location, and morphology, assessing complications, and guiding treatment decisions.

Keywords

Foreign Bodies, Pediatric, Plain Abdominal X-Ray, Radiopaque

1. Introduction

Intra-digestive foreign bodies can occur either accidentally or intentionally. They vary in nature, shape, and number [1]. These situations are common, particularly in emergency departments, and the pediatric population is most frequently affected [2]. The outcome can be favorable with spontaneous evacuation of the foreign body or bodies via natural routes [1]. However, emergencies may arise due to complications such as perforation and superinfection [3]. Abdominal X-rays without preparation provide a simple means of detecting intra-digestive foreign bodies, their localization, and potential complications, and they offer therapeutic guidance and monitoring.

2. Materials and Methods

This is a single-center retrospective descriptive study conducted over a two-year period, from April 2021 to April 2023, within the Radiology Department of the Eaubonne Montmorency Hospital Group in Paris, France.

We included all patients who underwent an abdominal X-ray without preparation following the ingestion or insertion of foreign bodies. We excluded inhaled foreign bodies, incomplete records, and extra-digestive intra-abdominal foreign bodies such as Cristalenet® or Pacs®. Data were entered using Microsoft Excel software.

3. Results

During this period, we recorded 62 cases of AXR showing radiopaque foreign bodies projected in the digestive tract out of a total of 1,977 AXRs, corresponding to a rate of 3.14%. There was a male predominance, with a sex ratio of 2. The pediatric population under 10 years old was the most represented, with age extremes ranging from 9 months to 82 years (Table 1).

Most incidents occurred accidentally in patients without known psychiatric disorders. A history of psychosis was noted in 4.8% of cases (Figure 1). In more than 98% of cases, the entry route was ingestion. We report one case of rectal insertion in a psychotic patient. The months of July and June saw the highest number of

diagnosed cases.

Table 1. Age distribution.

Age (year)	Sample size (n = 62)	Percentage (%)
0 - 10	53	85.5
11 - 20	5	8.1
21 - 80	3	4.8
>80	1	1.6

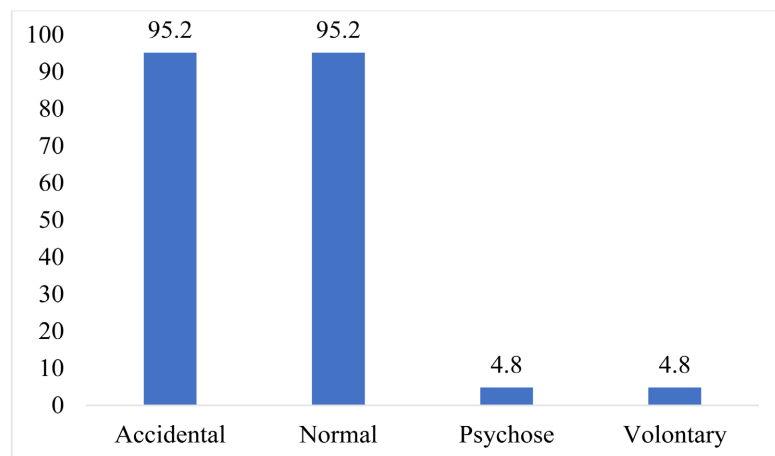


Figure 1. Distribution according to the circumstances of occurrence (%).

Reported symptoms included abdominal pain (11.2%), vomiting (9.6%), and odynophagia (4.8%), cessation of feces and gases (3.2%) in conscious patients. In 72% of cases, a complementary chest X-ray was performed, and two patients underwent a CT scan. All identified foreign bodies were radiopaque, measuring between 5 mm and 10 cm, with an average size of 22.58 mm.

In more than 96% of cases, a single foreign body was found; there was one case with two foreign bodies and another with multiple. Radiographically, the most common shape was rounded (**Table 2**), typically resembling a coin in 53.2% of cases (**Figure 2**, **Figure 3**). The umbilical region was the most frequent location of the foreign body on initial Abdominal X-ray (**Figure 4**).

Table 2. Shape distribution.

Shapes	Sample size (n = 62)	Percentage (%)
Rounded	37	59.6
Linear	15	24.3
Annular	1	1.6
Polymorphic	9	14.5

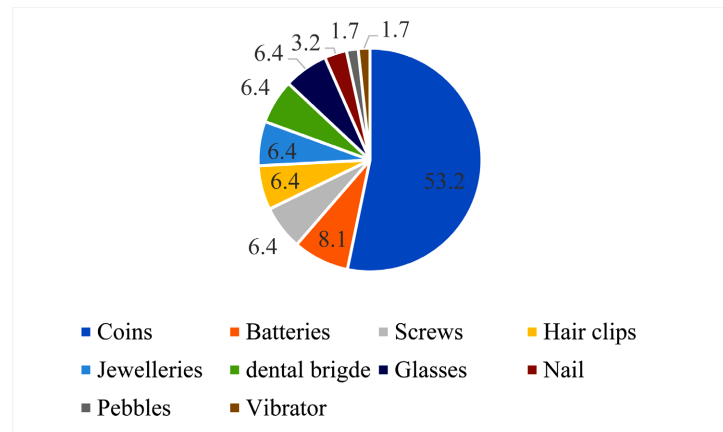


Figure 2. Distribution of foreign bodies according to their macroscopic appearance (%).

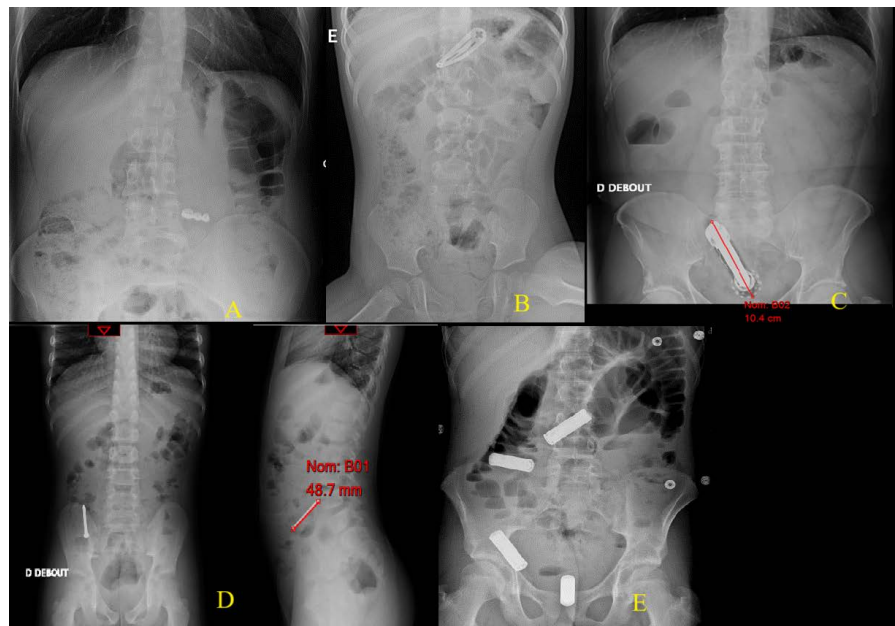


Figure 3. Abdominal radiography plain (A: Bridge dental, B: Hair clip, C: Vibrator, D: Nail, E: Batteries).

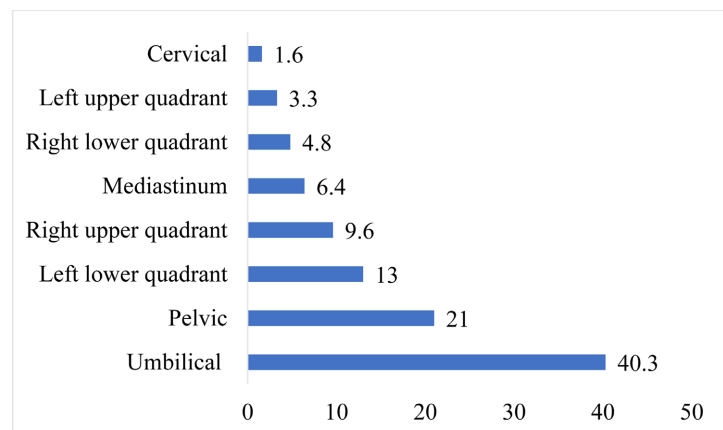


Figure 4. Distribution according to the projection site of foreign bodies (%).

Only minor complications were noted: fecal stasis (69.2%) and aerocolia (69.7%). Daily radiological monitoring was performed, and spontaneous evacuation occurred in 93.5% of patients. One case required surgical treatment, and three underwent endoscopic extraction.

4. Discussion

We collected 62 cases of foreign bodies in the digestive tract using conventional radiography. The number of cases depended both on the study duration and diagnostic methods [4]-[6].

Our study found a predominance of the pediatric population, with a mean age of 8.04 years. Vignon similarly reported a pediatric predominance of 84.4% [7]. In Jgounni's study, the mean age was 24.4 years due to a different patient demographic.

Males predominated in our study (sex ratio = 2), consistent with the literature [6] [7]. This may be explained by a higher incidence of accident among males.

Like our findings, Jgounni and Lahlou also reported accidental causes in most digestive foreign body cases [6]. Unfortunately, we were not able to study other risk factors such as alcohol/tobacco use or incarceration.

Abdominal pain was the most common symptom in our study. This contrasts with Vignon and Bakri, who reported more upper digestive symptoms due to esophageal locations, whereas in our study, foreign bodies were mostly peri-umbilical [7] [8].

Diagnosis in our study relied on conventional radiography, including AXR and, in some cases, chest X-rays. In Togo's study, a chest X-ray was systematically added, and fibroscopy played a major diagnostic role [5]. This difference may reflect the foreign body location or variations in protocols across institutions.

CT played a limited role in our study, similar to Togo's findings, as it is a second-line diagnostic tool.

Most identified objects were under 10 cm and radiopaque [5] [6]. Radiotransparent objects represent a limitation of conventional radiography, necessitating other diagnostic modalities.

Multiple foreign bodies in the digestive tract are rare, as also shown in Jgounni's study [6].

Metal coins were the most common foreign body in our series, as in other literature [5] [6], likely due to the pediatric age group, an age characterized by oral exploration. Pointed metallic objects were mostly found in cases of intentional insertion.

According to the literature, most foreign bodies are located in the stomach at diagnosis [6]. Since conventional radiography is two-dimensional, exact localization within the digestive tract cannot be confirmed. However, in our study, most opacities were found in the umbilical region, suggesting gastric localization. We only observed minor complications.

In our study, 93.5% of foreign bodies passed naturally within 2 to 3 days. Upper

digestive endoscopy was the preferred diagnostic and therapeutic tool for esophageal foreign bodies. Surgery was indicated in cases of halted progression or endoscopic failure, or when complications such as perforation-induced peritonitis occurred [5] [7].

5. Conclusion

Digestive tract foreign bodies are common, particularly among children, and twice as frequent in boys than girls. Clinical manifestations depend on the object's location within the tract, and complications vary according to the shape, size, or number of foreign bodies. Conventional radiography still plays an important role in their management by identifying location, describing morphology, and guiding treatment, be it endoscopic, surgical, or natural evacuation.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- [1] El Marini, H., El Belloute, S., Benelbarhdadi, I., Essamri, W., Ajana, F.Z., Afifi, R. and Essaid, A.E. (2001) The Varieties of Ingested Foreign Bodies in Our Daily Practice. *Acta Endoscopica*, **41**, 123-128.
- [2] Letard, J.C., Gay, G., Ponchon, T., Napoléon, B., Boyer, J., Canard, J.M. and Marchetti, B. (2004) Ingested Foreign Bodies. *Acta Endoscopica*, **34**, 627-629.
- [3] Sola, C., Pico, J. and Dadure, C. (2002) Ingestion of Foreign Bodies in Children: Review and Updates. *Anesthésie & Réanimation*, **8**, 566-575.
- [4] Lakdhar-Idrissi, M. and Hida, M. (1794) Ingestion of Foreign Bodies in Children: A Report on 105 Cases (2011). *Archives Pédiatriques*, **8**, 843-934.
- [5] Togo, S., Ouattara, M.A., Li, X., Yang, S.W. and Koumaré, S. (2017) Management of Esophageal Foreign Bodies: A Report on 36 Cases. *Pan African Medical Journal*, **27**, Article 207.
- [6] Jgounni, R., Louzi, A., Finech, B., Gharaba, S., El-Fadil, K., Samlani-Sebbane, Z., Dif-faa, A. and Krati, K. (2011) Ingestion of Foreign Bodies in Adults: Epidemiological, Clinical, and Therapeutic Approach in the Marrakech Region. *African Journal of Gastroenterology and Hepatology*, **5**, 232-235.
- [7] Vignon, R.K., Kodjoh, N., Sehonou, J. and Olory-Togbe, J.L. (2014) Endoscopic Management of Esophageal Foreign Bodies in Benin. *African Journal of Gastroenterology and Hepatology*, **8**, 135-138.
- [8] Bakri, S., Batouche, D., Sadouk, H. and Fergoug, B. (2021) Ingestion de pieces de monnaie chez l'enfant: Notre expérience dans la prise en charge aux urgences de l'établissement hospitalo-universitaire d'Oran. *Revue Médicale de l'HMRUO*, **8**, 23-27.