Research Article
Volume 16:2, 2020
DOI: 10.37421/jos.2020.16.7

Journal of Surgery [Jurnalul de chirurgie]

ISSN: 1584-9341 **Open Access**

Accidental Ingestion of Foreign Bodies in Children: Experience from Developing Countries

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Abstract

Introduction: Accidental ingestion of foreign bodies in children is uncommon, regardless of whether in the developed or underdeveloped countries. Reports in the United States show that the most common object is a coin. The majority of the patients are asymptomatic. As the patients are asymptomatic, most of the patients were treated conservatively as the foreign bodies pass out spontaneously. In certain cases, an endoscopy is needed to retrieve the objects. This study illustrates the experience in managing the condition in a developing country.

Methods: This is a retrospective study looking into the management of accidental foreign body ingestion in the local hospital. A computer search was made into the hospital database searching for a diagnosis of foreign body ingestion between April 2017 to May 2018. The parameters of the patients were retrieved from the computer database. Patients with incomplete data were excluded

Result: 14 patients were identified with the diagnosis of ingested foreign bodies. One was excluded due to incomplete data. The patients' age ranges from 1 to 10 years old with 6/13 (46%) are 3 years or below. The most common objects ingested is coin (46%) followed by coin cell battery (23%). Only in one patient, the ingested material was radiolucent (stone) which was not seen on a radiograph. The majority (76.9%) of the ingested material passed out spontaneously except in 3/13 (23%), endoscopic retrieval of the material needed to be performed. There was no patient needed exploratory laparotomy.

Conclusion: Accidental ingestion of coin is still the most common objects in children. Coin cell battery which is commonly used in an electronic device is getting more common. The majority of the objects can be visualized by radiograph and in the majority of cases, the material passed out spontaneously without any intervention.

Keywords: Children • Accidental • Foreign bodies • Endoscopy

Introduction

Accidental ingestion of foreign bodies is not uncommon, especially among the children. The patient may be symptomatic or asymptomatic depending on the object ingested. Because of asymptomatic or non-specific nature of the condition, it contributes to the delay of the diagnosis and potential complications which include obstruction, mucosal injury, and perforation. The majority (80%) involve children between the ages of 6 months to 3 years old. The most common object ingested is coin but other things like disc-battery and magnets are also been reported. The initial investigation used to be an abdominal or chest radiographs but being gradually replaced by ultrasound, to avoid radiation exposure in children. In most cases, the object will pass through by itself and surgical intervention is only needed when the child developed significant symptoms or the object fails to progress. This study will review the data on the ingested foreign material in the developing countries which is postulated to be not much different from another part of the world.

Material and Methods

This is a retrospective study looking into the management of accidental foreign body ingestion in the local general hospital in a developing country. The communities stay in town, which is not a busy metropolitan. A computer search was made into the hospital database searching for a diagnosis of foreign body ingestion between April 2017 to May 2018. The parameters of the patients were retrieved from the computer database. Patients with incomplete data were excluded.

Results

A total of 14 patients were identified with the diagnosis of ingested foreign bodies (Table 1). One was excluded due to incomplete data. The patients' age ranges from 1 to 10 years old with 6/13 (46%) are 3 years or below. The majority were girls (8/13) with boys 5/13. The most common objects ingested is coin (46%) followed by coin cell battery (23%). Only in one patient, the ingested material was radiolucent (stone) which was not seen on radiograph. The majority (76.9%) of the ingested material passed out spontaneously except in 3/13 (23%), endoscopic retrieval of the material needed to be

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Received: 30 March, 2020; **Accepted:** 12 May, 2020**; Published:** 21 May, 2020

performed. The first patient admitted ingesting coin and chest radiograph showed coin at the level of T1 and T2 which was not progressing (Figure 1). Endoscopic removal of the coin was successfully performed. In the second patient, the girl alleged ingested a coin. The abdominal radiograph showed the coin in the antrum of the stomach which was not progressing (Figure 2). An upper endoscopy was performed and the coin was retrieved endoscopically. The last patient admitted for ingesting magnet and the chest radiograph showed a foreign body in the esophagus which was successfully removed endoscopically. There was no patient needed exploratory laparotomy.

Table 1. Summary of the patients.

No.	Age	Sex	Ingested material	Diagnostic imaging	Initial location	Endoscopy	Treatment
1	1	M	Coin cell battery	Abdominal radiograph	Stomach	No	Conservative
2	1	M	Coin	Chest radiograph	Esophagus	Yes	Endoscopic removal
3	1.5	F	Coin cell battery	Abdominal radiograph	Small bowel	No	Conservative
4	2	F	Magnet	Chest radiograph	Esophagus	Yes	Endoscopic removal
5	2	F	AAA battery	Abdominal radiograph	Stomach	No	Conservative
6	3	F	Prayer beads	Abdominal radiograph	Stomach	No	Conservative
7	4	F	Coin	Abdominal radiograph	Stomach	No	Conservative
8	4	F	Coin	Chest radiograph	Esophagus	No	Conservative
9	4	F	Coin	Abdominal radiograph	Stomach	Yes	Conservative
10	6	M	Coin	Abdominal radiograph	Colon	No	Conservative
11	6	M	Stone	Abdominal radiograph	Not seen-Radiolucent	No	Conservative
12	6	F	Coin	Abdominal radiograph	Stomach	Yes	Endoscopic removal
13	10	M	Coin cell battery	Abdominal radiograph	Colon	Yes	Conservative

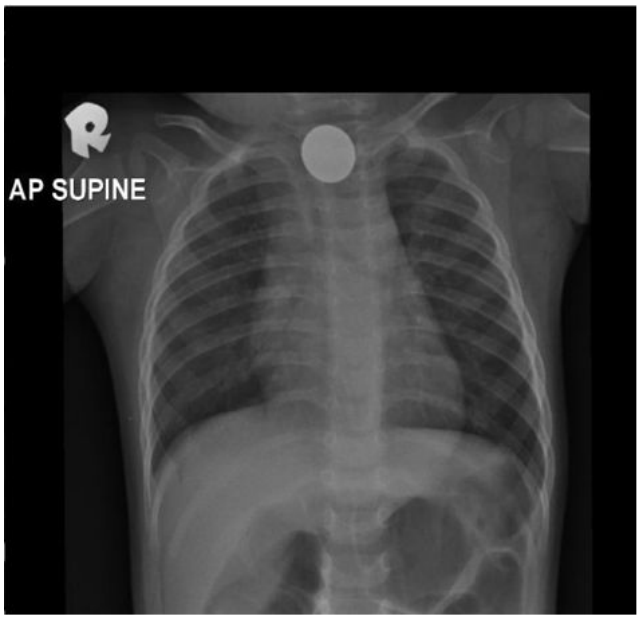

Figure 1. One-year-old boy who ingested a coin and the chest radiograph shows it was in the esophagus at the level of T1-T2.

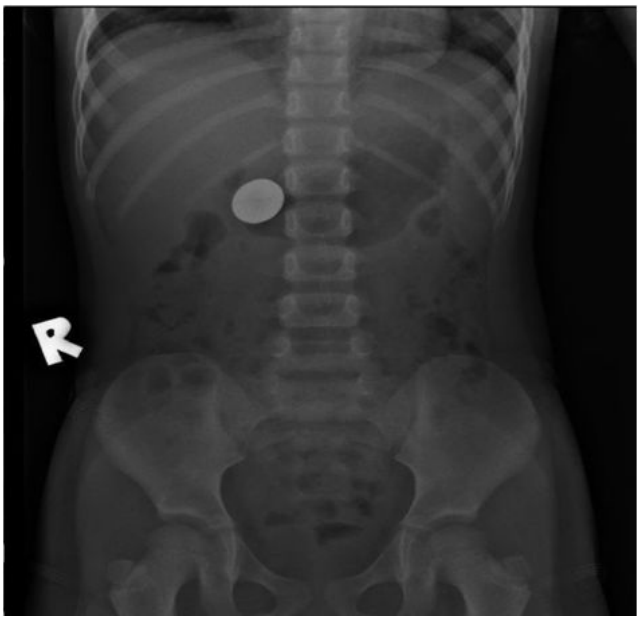

Figure 2. A 6-year-old girl who accidentally ingested a coin with an abdominal radiograph showing the coin stop in the antrum of the stomach.

Discussion

Foreign Bodies Ingestion (FBI) in children is not uncommon. The material ingested varies from small objects like coin cell batteries, coins, and various

other objects which may have sharp edges and detrimental to the children. The types of common materials vary according to the surrounding factors including the traditions and nutritional habits. In addition to that, materials ingested will theoretically be different between the more developed and developing countries.

In the majority of cases, the ingested material will be able to pass through the gastrointestinal tract without a problem but because of different sizes and edges, endoscopic removal may be necessary in 10%-20% of cases and even surgical intervention may also be necessary in a minority of cases [1,2]. In this study which is a hospital in a developing country, the most common ingested foreign bodies are a coin and followed by batteries. This is not dissimilar from developed countries which also found that coin is the most common ingested foreign body in children but differ from central Asia like Turkey were the most common ingested material was safety pin [3-5]. Coin cell batteries are getting more common owing to the increasing use in an electronic device and this is similarly seen in our study population.

In most circumstances, the children who accidentally ingested the foreign bodies are asymptomatic, making the diagnosis very difficult especially when it happens in younger children. They may present with non-specific symptoms like irritability or refuse feeding. Or the foreign bodies may pass out spontaneously and only noticed in the stool when they open their bowel. In the series presented, the children were brought to the hospital either because the parent noticed the ingestion or the patients were symptomatic. The initial imaging study commonly performed is the radiograph of the neck, thorax, and abdomen. In the series presented, 10/13 (76.9%) of the foreign bodies were detected in the abdomen. The location of the impaction is largely influenced by the shape and size of the FBI and the anatomical constriction or narrowing of the gastrointestinal tract like the cricopharyngeus muscle, the level of the aortic arch, and the lower esophageal sphincter [6]. Unfortunately, the use of radiographs only able to detect radio-opaque FBI. This is shown in one of our patients who accidentally ingested stone and was not shown on plain radiograph. Other alternative includes handheld metal detectors and ultrasound [7-9].

In general, surgical intervention is needed when the patient unable to pass the foreign bodies spontaneously or to prevent potential complications. Therefore, the timing of the intervention varies according to the indication. Flexible endoscopy is the most common tool used as it is diagnostic as well as therapeutic [10]. Depending on the availability, commonly used tools include polypectomy snares, forceps, magnetic probes, retrieval snare net or basket, and transparent cap-fitting device [11,12]. Surgical intervention should be reserved in case of complications like perforation or failure to the progress of ingested sharp objects [13]. In our study population, three of the patients needed endoscopic intervention due to failure to progress. All the foreign bodies were successfully retrieved as they have not passed the stomach and not sharp objects.

Conclusion

Various objects had been ingested by young children either purposely or accidentally. The objects and demographics of patients were not much different from developing or developed countries. Similarly, the diagnostic method and management of the patients in the developing countries follow the trends as in other countries. Early diagnosis and management of the patients are important to reduce the potential risk of complications.

Acknowledgement

We would like to thank the Director-General of Health, Malaysia for his permission to publish this paper. We also acknowledge the Director of Hospital Sultanah Nor Zahirah for the cooperation in providing the information of the study presented.

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How to cite this article: Rohaizak, M, RA Mukhlis and NFHA Dalek. "Accidental Ingestion of Foreign Bodies in Children: Experience from Developing Countries". J Surg 16 (2020): 7. doi: 10.37421/jos.2020.16.7