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## Case report

# Role of computed tomography (CT) in identifying foreign body ingestion in an individual with autism – A case report<sup>☆</sup>

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## ABSTRACT

Foreign body ingestions are quite common and most often will uneventfully pass in stool, however, some ingestions, can lead to complications such as obstruction. If left untreated, this can lead to perforation and fistula formation. Hence, threshold for intervention should be low and diagnostic imaging can assist with treatment decisions. We present to you a case of 17-year-old male with non-verbal autism with an unusual hollow foreign body ingestion leading to small bowel obstruction.

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## Introduction

Foreign body ingestions are quite common among children; however, these risks are higher among children with autism regarding both accidental and voluntary ingestion [1]. Most ingested foreign bodies will uneventfully pass in stool, however, based on the size, structure, and location ingestion can lead to complications such as obstruction, and can eventually lead to complications, such as perforation and fistula formation [2]. In individuals with non-verbal autism, diagnosing foreign body ingestion can be quite challenging, as the consumption is often unwitnessed, and the clinical manifestation can be quite non-specific. Diagnostic imaging can be crucial in

identifying object characteristics and extra-luminal findings which can aid in treatment decisions. Most common types of ingested foreign bodies tend to be metallic pieces, plastic objects, or synthetic fibers [3,4]. We present to you a case of 17-year-old male with non-verbal autism with an unusual hollow foreign body ingestion leading to small bowel obstruction and required a diagnostic laparoscopy.

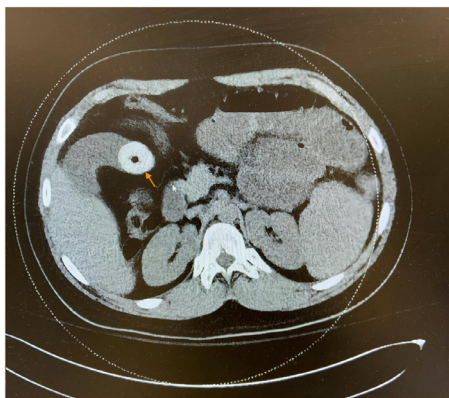
## Case report

We present a case of a 17-year-old male with non-verbal autism, who presented to emergency with a 24-hour history

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**Fig. 1 – A 3 cm circular air containing object located approximately 40 cm proximal to the ileocecal valve.**



**Fig. 2 – Retrieved 3 cm x 3 cm whole unshelled and unopened chestnut.**

of abdominal pain, watery diarrhea, nausea, and vomiting. On initial evaluation in ED, he was no longer passing gas or stool. He had a previous history of laparotomy to extract 2 whole limes from his jejunum 6 months prior. Laboratory investigations showed a WBC of 13.6 with normal electrolytes and liver panel. He was afebrile with normal vitals. On physical exam he appeared well, but his abdomen was distended and tympanic with mild generalized tenderness. A CT scan of his abdomen demonstrated a 3cm circular air containing object located approximately 40cm proximal to the ileocecal valve (Fig. 1). The proximal small bowel was dilated and there was a small amount of free fluid in the pelvis (Fig. 1). Given his past medical history, it was felt that this patient had an unwitnessed foreign body ingestion, and the object was identified only on cross-sectional imaging of abdominal CT scan. Nasogastric tube was inserted for proximal decompression while awaiting surgical management. The patient underwent diagnostic laparoscopy to identify the point of obstruction. The small bowel was exteriorized through a small incision and enterotomy was made to remove a 3cm x 3 cm whole unshelled chestnut from the ileum (Fig. 2). The chestnut was unopened and consumed unshelled as shown in Figure 2. The bowel was repaired primarily. The patient had an uncomplicated recovery post-operatively.

## Discussion

Risk of accidental or voluntary foreign body ingestion is higher in patients with decreased mental capacity, as well as patients belonging to vulnerable populations, which include individuals who; are incarcerated, have mental illness or addiction, have dementia or delirium, or have physical limitations [1]. Cases reports have described small bowel obstruction in patients with pica from foreign body ingestions in the background of autism, as is the case with this patient [5,6]. There are multiple points in the gastrointestinal tract that are at increased risk for obstruction including the esophagus, pre-pyloric region, the ligament of Treitz, the ileocecal valve and the rectosigmoid junction [1].

Autism is a neurodevelopmental disorder which is characterized by emotional, communication and social deficits across multiple contexts. Literature suggests that pica, which is a repeated ingestion of non-food items, is quite prevalent in individuals with autism [7]. In individuals with non-verbal autism, diagnosing foreign body ingestion can be quite challenging, as the consumption is often unwitnessed as was the situation in this case report. Most common types of ingested foreign bodies tend to be metallic pieces, plastic objects, or synthetic fibers [3,4]. However, ingestion of a whole unshelled chestnut is unique and awareness of specific characteristics from a radiology perspective can aid in guiding further management.

A research study identified that CT scans were a nondestructive predictor of internal components of a fresh chestnut with 90.6% overall accuracy using Hounsfield unit measurements [8]. Literature reveals that in the field of agriculture CT scans have proven to be accurate predictors of internal properties of mangos and peaches [9,10]. It has also been used to determine the translucency and ripeness of pineapples [11]. Donis-González et al. (2012) identified that healthy chestnut tend to have higher HU values of 25 to 300, compared to pellicle (-209 to 24 HU) or decayed chestnuts (-499 to -210 HU) [8]. The patient in our case report had swallowed a whole unopened, unshelled healthy chestnut. Fig. 2, which seems to be in keeping with the CT scan findings of an object with HU likely 80-200 given its hyperdensity compared to adjacent intracoelomic organs (Fig. 2). Unfortunately, the HU value of the object was unreported to make a definitive statement.

Chen and Suk (2011) presented a case report of an elastic intraluminal bezoar with fragments of chestnut obstructing the proximal jejunum [12]. Bezoars are concretions in the stomach or small intestine of undigested material. Literature identifies phytobezoars (composed of typically cellulose and other nondigestible plant products) as one of the most common bezoars [13]. Chestnut contains polymerized tannins which can act as nucleus for bezoar formation, which can in turn lead to complete intestinal obstruction [12]. Literature identifies distinct CT findings for accurate diagnosis of bezoars, which include “mottled intraluminal mass with soft-tissue attenuation that contains air bubbles and is located immediately proximal to the site of the obstruction.” [13] Our case report is unique as it identifies an individual who consumed a whole unshelled chestnut.

Research suggests that most ingested foreign bodies (80–90%) will uneventfully pass in stool [2]. However, 10%–20% of foreign body ingestions must be removed endoscopically, with around 1% requiring surgery [2]. Watchful waiting with serial imaging is often sufficient to confirm that a foreign body has passed depending on the size, shape, and material [2]. However, once an intestinal obstruction is suspected, as pertained by lack of bowel movement and flatus in the context of abdominal pain, nausea, and vomiting; upper/lower endoscopy and/or surgical intervention may be warranted to extract the foreign body [1]. As research suggests that, untreated individuals may be at higher risk of “perforation, obstruction, esophageal-aortic fistula or tracheoesophageal fistula formation, and sepsis.” [2] Literature suggests that the use of IV contrast in foreign body detection is not well defined, but it may assist with identifying complications such as fistula, peritonitis, and abscess [2] Given the risk of these complications, clinical suspicion should be low and a CT scan should be ordered looking for a possible foreign body ingestion, especially because clinical history is often limited, and manifestations are often nonspecific.

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### Patient consent

Informed written consent has been obtained from the patient. No personal identification information of the person is included in the case report. All images are entirely anonymized from which the individual cannot be identified.

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