

Intentional Foreign Body Ingestions: A Complex, Recurrent and Costly Issue

AEF **Muaaz Masood** 

Department of Internal Medicine, Medical College of Georgia at Augusta University, Augusta, GA, USA

Authors' Contribution:
Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
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Corresponding Author: Muaaz Masood, e-mail: mmasood@augusta.edu
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Patient: Male, 23-year-old
Final Diagnosis: Foreign body ingestion
Symptoms: Abdominal pain • nausea
Medication: —
Clinical Procedure: —
Specialty: Gastroenterology and Hepatology • General and Internal Medicine • Psychiatry • Toxicology

Objective: Rare disease

Background: Recurrent intentional foreign body (RIFB) ingestion is a complex and costly issue among patients in prison and those with psychiatric disorders. Risk factors for RIFB ingestion include male sex, incarceration, and the presence of a psychiatric disorder. Most patients can be managed with observation and endoscopy. Surgery is indicated in cases involving perforation or obstruction. The literature on preventative strategies for RIFB ingestion is scarce.

Case Report: A 23-year-old man required 6 admissions in 1 calendar year for intentional foreign body ingestions. The patient was living in prison and had a history of bipolar I disorder, schizophrenia, and borderline personality disorder. He underwent 9 endoscopic procedures that retrieved a total of 64 objects. The primary imaging modalities were abdominal X-ray and abdominopelvic contrast-enhanced computed tomography scan. The patient was managed with endoscopy and, in 2 cases, with observation alone. Serial abdominal examinations and abdominal films were used to monitor the progress of foreign bodies that were difficult to retrieve. A bowel regimen with polyethylene glycol facilitated the passage of the objects. The patient never required surgical intervention. The mean length of stay was 4.17 days. The recurrent ingestions may have been related to compulsions and family stress.

Conclusions: Interdisciplinary collaboration is paramount in formulating effective treatment plans and limiting recurrence. Proposed strategies to prevent RIFB ingestion include the removal of ingestible objects from the environment, specialized prison units for close monitoring, early psychiatric intervention with appropriate pharmacologic/behavioral therapy, and limiting hospital admissions to prevent secondary gain. Further studies are needed to determine the most effective approach to manage and prevent RIFB ingestion.

Keywords: Endoscopy, Gastrointestinal • Foreign Bodies • Prisoners

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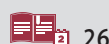
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Background

Recurrent intentional foreign body (RIFB) ingestion is a challenging issue that poses serious medical consequences and has substantial financial implications. Health care costs associated with RIFB ingestion have been reported to be over \$6 billion [1]. The rates of RIFB ingestion are especially high among people who are incarcerated. These costs typically do not include the additional expenses of providing security guards and safe transportation for the patients. Among patients who require hospital admission for foreign body ingestion, the per-episode median charge surpasses \$14 000 [2]. Most cases of foreign body ingestions occur in pediatric patients. In adults, most cases of RIFB ingestion are nonaccidental and occur in prison and psychiatric populations [3]. The incidence of intentional foreign body ingestions in these high-risk groups has not been well studied. The annual incidence of foreign body ingestions among people in prisons from 2006 to 2010 in the state of Ohio was reported to be 1 in 1900 individuals [1]. While foreign body ingestions in pediatric patients typically involve small household objects (eg, toys, coins), ingestions among adults in prison and psychiatric patients involve large, sharp, and often dangerous objects (eg, blades, metal hardware). Nevertheless, most cases can be managed expectantly or with endoscopy. We present an interesting case of a 23-year-old man with a history of psychiatric disorders who had repeated admissions for RIFB ingestion at our institution.

Case Report

A 23-year-old man required multiple hospital admissions for intentional foreign body ingestions. The patient was living in prison and had a history of bipolar I disorder, schizophrenia, and borderline personality disorder. In 1 calendar year, the patient was admitted 6 times and underwent 9 endoscopic procedures that retrieved a total of 64 objects. Items removed included razor blades, pens, batteries, screws, wires, a shower curtain hook, an electrocardiogram clip, a toothbrush, and eating utensils (Figures 1-5). The patient typically presented with diffuse abdominal pain and nausea. Vital signs and laboratory studies were within reference ranges. The primary imaging modalities were abdominal X-ray and contrast-enhanced computed tomography (CT) scan of the abdomen and pelvis (Figure 6). The patient was managed with endoscopy and, in 2 cases, with observation alone. Serial abdominal examinations and abdominal X-rays were used to monitor the progress of foreign bodies that were difficult to retrieve. A bowel regimen with polyethylene glycol facilitated the passage of the objects. The patient never required surgical intervention. The mean length of stay was 4.17 days. The patient endorsed family stress as a possible trigger for ingestion. The psychiatrist at the prison reported that the recurrent ingestions may



Figure 1. Twenty-eight foreign bodies removed in a single endoscopic procedure, including pieces of toothbrushes, pens, pencils, straws, and screws that were in the gastric body and fundus.
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Figure 2. Endoscopic view of long, curved metal pieces in the stomach.
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have been related to compulsions. The patient continued to follow up closely with psychiatry.

Discussion

RIFB ingestions are often difficult to treat, and they consume substantial physician, hospital, and financial resources. Items that are ingested are small and readily available, such as pens,

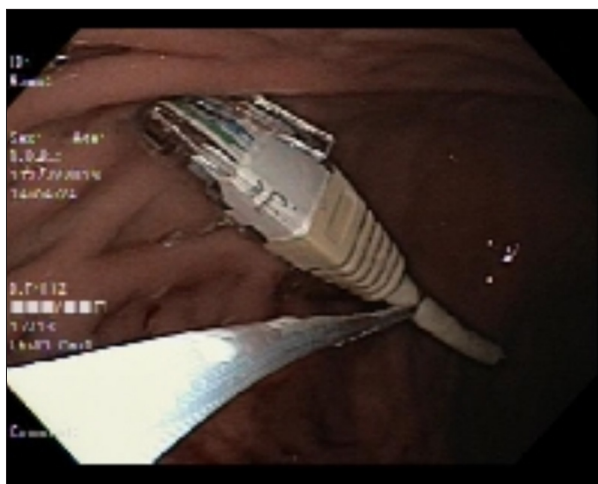


Figure 3. A phone cable visualized on endoscopy that was removed from the third portion of the duodenum.
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Figure 5. A large piece of paper in the gastric body visualized on endoscopy.
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Figure 4. A plastic electrocardiogram clip that was retrieved from the mid esophagus.
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razor blades, eating utensils, and paper clips. The majority of cases of RIFB ingestion are typically managed with observation because over 80% of foreign bodies pass spontaneously [4]. Patients may undergo serial physical examinations with radiographic assessment [5]. However, the rates of foreign body ingestion requiring endoscopic or surgical intervention are higher in prison populations compared with the general population owing to the nature of the objects ingested [6].

The need for and timing of endoscopic intervention are based on several factors, including the size, shape, and type of foreign

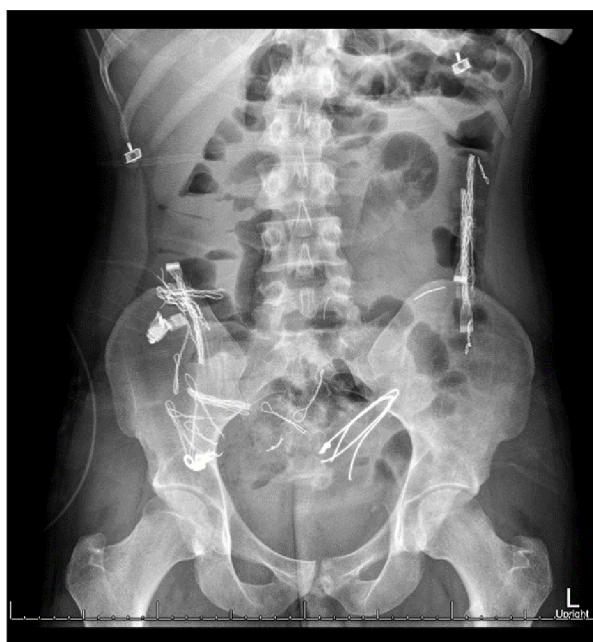


Figure 6. Abdominal film revealing numerous ingested metallic wires and objects in the colon.
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body ingested. The anatomic location and time since ingestion also play an important role in determining the decision for endoscopy. Based on the American Society of Gastrointestinal Endoscopy guidelines published in 2011, emergent endoscopy is indicated for sharp-pointed objects or disk batteries in the esophagus. Emergent endoscopy is also recommended in patients with

complete esophageal obstruction from the ingested object or food impaction resulting in an inability to manage secretions [7]. Urgent endoscopy is warranted for blunt objects, sharp objects in the stomach or duodenum, large objects (>6 cm) at or above the duodenum, and magnets within endoscopic reach. Patients should undergo nonurgent endoscopy for coins in the esophagus, objects in the stomach that are >2.5 cm, disk batteries, and cylindrical batteries without signs of gastrointestinal injury, which may be observed for up to 48 h based on current guidelines [7].

In a study of 305 patients with RIFB ingestion, Huang et al [8] reported that foreign bodies were most commonly retrieved using snares (58%) followed by rat-toothed forceps (14.4%), nets (11.5%), overtubes (10.8%), and rubber hoods (4.6%). Palta et al [9] reviewed 262 cases of RIFB ingestion and reported a 90% success rate for endoscopic extraction. Surgery is rarely required and is reserved for incidents with gastrointestinal perforation or obstruction. Factors associated with the risk of surgery for RIFB ingestion include an elevated white blood cell count and an increasing number of ingested items [4]. Surgery in patients living in prisons should be avoided unless necessary because of an increased risk of future surgeries and self-mutilation of surgical wounds [10].

The frequency of ingestion and the number of objects ingested may escalate over time in some patients. Risk factors for recurrent ingestion include male sex, incarceration, and the presence of a psychiatric disorder [11]. The prison population is especially challenging due to the multifactorial nature of ingestion episodes. RIFB ingestion may represent a form of self-injurious or impulsive behavior due to an undiagnosed or undertreated psychiatric condition [12]. Foreign body ingestion as a means of committing suicide is rare partly due to its ineffectiveness and the slow onset of action in terms of lethality [13]. Urgent psychiatric evaluation should be performed in patients with intent to self-harm to determine further course of action (eg, the need for an involuntary hold and psychotropic medications). With regard to the management of foreign bodies, the approach to individuals who have ingested foreign bodies with the intent to commit suicide is similar to those without suicidal intent. Patients may undergo observation, endoscopy, or surgery, as indicated. Four main psychiatric disorders have been implicated in RIFB ingestion including malingering, psychosis, pica, and personality disorders [14]. Our patient had a history of bipolar I disorder, schizophrenia, and borderline personality disorder. Substance abuse may also play a role in these behaviors [15]. A secondary gain to leave prison can often be a motive behind the ingestions.

Clinicians must be aware of individuals who intentionally ingest illicit substances for trafficking, known as body packers, and those who ingest drugs to evade police arrest, known as body stuffers. The initial evaluation of body packers should

include a thorough history and physical examination to determine the details of the ingestion. Signs and symptoms related to systemic drug toxicity and gastrointestinal obstruction or perforation should be ascertained. The most common illicit substances involved in body packing are cocaine followed by heroin and methamphetamine [16]. Cocaine poisoning presents with sympathomimetic effects, including tachycardia, hypertension, hyperthermia, agitation, mydriasis, and seizures. Poisoning from methamphetamine manifests in a similar manner to poisoning from cocaine. The opioid toxidrome involves hypotension, bradycardia, respiratory depression, a decreased level of consciousness, and miosis. Imaging with plain film and CT scan is helpful in identifying the size, number, and location of ingested packages. The risk of package perforation increases in proportion to the number of packages ingested [17]. Patients with severe symptoms and a high risk of rupture should be monitored in the Intensive Care Unit. Activated charcoal has been used if drug leakage is suspected in cocaine poisoning, although data are limited [18]. Endoscopic retrieval should be performed by a highly trained endoscopist due to the risk of package rupture [19]. The standard treatment of body packers and body stuffers depends on the substance ingested. Patients with opioid poisoning should receive adequate ventilation and may be treated with intravenous naloxone for respiratory depression. Patients with signs and symptoms of methamphetamine or cocaine poisoning are treated with intravenous benzodiazepines. Individuals who do not respond to medical therapy may undergo urgent surgical intervention for package removal [16]. A surgical consult with careful consideration of the risks and benefits of intervention should be performed. Asymptomatic body stuffers should be closely monitored until packages have safely passed, with longer observation times indicated for patients who have ingested large or loosely wrapped packages [20]. Recommendations from medical toxicology may aid in the overall management of intentional drug ingestions and when to safely discharge the patient.

Interdisciplinary collaboration involving Emergency Department physicians, gastroenterologists, psychiatrists, and internists is required to provide optimal care to patients with recurrent ingestions [21]. RIFB ingestions are often a source of frustration among providers and consume a large amount of hospital and fiscal resources. The literature on preventative strategies for RIFB ingestion among individuals in prison is scarce. Recent reports have proposed strategies that may mitigate RIFB ingestion, such as the removal of potentially ingestible objects from the patient's room and specialized prison units for close monitoring [22]. Early consultation with psychiatry is likely beneficial to address underlying psychosocial conditions and may limit the escalation of self-harming behaviors. Pharmacological treatment has been limited in its efficacy, especially in patients with malingering. Antidepressants, mood stabilizers, and antipsychotic agents may be used to treat underlying mood or impulse disorders [8].

Additional medications such as naltrexone and clonidine have been shown to significantly decrease the impulsive drive to self-harm [23,24]. Behavioral therapy may also curb impulsivity and self-injurious acts, but there have not been well-studied protocols to specifically address RIFB ingestion [21]. Studies have shown that dialectical behavioral therapy, supportive therapy, and other cognitive behavioral therapies have been effective in reducing self-injury, hopelessness, and depression in this population [25,26]. As the majority of cases of RIFB ingestion resolve with observation, it is possible that many patients are able to be treated expectantly without transfer out of the correctional facility or in the Emergency Department, which may reduce hospital admissions and secondary gain [8].

Conclusions

RIFB ingestion is a complex and costly issue among patients living in prisons and those with psychiatric disorders. Most patients can be managed with observation and endoscopy. Surgery is indicated in cases involving perforation or obstruction. Clinicians should also identify and appropriately manage patients who ingest with the sole intent of committing suicide or for the purposes of drug trafficking or evading police arrest.

An interdisciplinary approach is paramount in formulating effective treatment plans and limiting recurrence among patients

living in prisons and those with psychiatric disorders. Proposed strategies to prevent RIFB ingestion include the removal of ingestible objects from the environment, specialized prison units for close monitoring, early psychiatric intervention with appropriate pharmacologic/behavioral therapy, and limiting hospital admissions to prevent secondary gain. Further studies are needed to explore efficacious management plans, evaluate the impact of mitigation strategies, and determine the optimal approach for the prevention of RIFB ingestion.

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Declaration of Figures' Authenticity

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