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Case Series of Accidental Toothbrush Ingestion: Successful Endoscopic Management of Foreign Bodies in the Stomach

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ABSTRACT
Foreign body ingestion is a common clinical challenge, particularly in pediatric populations, but it can also occur in adults. This case series presents two instances of accidental toothbrush ingestion, highlighting the clinical presentation, diagnostic approach, management and outcomes. The first case involved a 21-year-old male who presented to the emergency department six hours post-ingestion with no significant symptoms. Imaging revealed a normal abdominal X-ray and endoscopic evaluation identified the toothbrush lodged at the gastroesophageal junction. Successful endoscopic removal was performed using a snare, with the patient experiencing immediate relief and no complications. The second case involved a 19-year-old male who ingested a toothbrush 1.5 months prior. He presented without significant symptoms and imaging showed a linear foreign body extending from the stomach fundus to the pylorus. Endoscopy revealed the toothbrush with bristles extending into the duodenum. Initial attempts at removal with a snare were unsuccessful due to inadequate space., however, a vicryl loop was employed to facilitate extraction. The procedure was successful, with no injuries noted to the gastrointestinal tract. These cases illustrate the importance of prompt recognition and intervention in foreign body ingestion cases, especially for objects that can pose significant risks if left untreated. Endoscopic techniques offer a safe and effective means of removal, leading to favorable outcomes and reduced morbidity. This case series emphasizes the need for awareness among clinicians regarding the potential for foreign body ingestion and the importance of endoscopic management.

INTRODUCTION

Foreign body ingestion is a significant clinical concern that can result in various complications, including obstruction, perforation and infections. While it is more prevalent in children, adults are also at risk, particularly in the context of cognitive impairments or specific behavioral tendencies. The ingested items can vary greatly, from food particles and coins to more unusual objects like toothbrushes, which can pose unique management challenges[1-3]. Ingestion of foreign bodies can lead to severe complications, often necessitating surgical intervention. It is estimated that approximately 1% of all emergency department visits in the United States involve foreign body ingestion, with the most commonly ingested items being food, coins, and toys. A review of the literature indicates that the gastrointestinal tract can accommodate foreign bodies of considerable size, but the risk of complications increases significantly with time, particularly if the object becomes lodged or causes obstruction. The clinical presentation of foreign body ingestion can be varied. Some patients may exhibit acute symptoms such as vomiting, abdominal pain, and dysphagia, while others may remain asymptomatic, delaying diagnosis and intervention. Therefore, a thorough history and clinical examination, combined with appropriate imaging studies, are critical in the evaluation process. Imaging studies, including plain abdominal X-rays and computed tomography (CT) scans, are essential for assessing the location and type of foreign body. Studies have shown that radiopaque objects are easily identified on X-rays, while CT scans can provide more detailed information, especially for non-radiopaque materials. Endoscopic retrieval has become the preferred method for removing ingested foreign bodies due to its minimally invasive nature and high success rate. The overall success rate for endoscopic foreign body retrieval is reported to be between 80% and 90%. Common techniques used during endoscopy include snares and grasping devices, though specialized techniques may be necessary for larger or irregularly shaped objects. The following case series presents two cases of accidental toothbrush ingestion in young adults, detailing their clinical presentation, diagnostic approach, management strategies and outcomes. These cases emphasize the need for timely intervention and highlight the effectiveness of endoscopic techniques in managing foreign body ingestion[3-6].

MATERIALS AND METHODS

- **Study Design:** This is a retrospective case series analyzing two cases of accidental toothbrush ingestion treated at Vilasrao Deshmukh Government medical college, Latur over a 4 months
- **Patient Selection:**

Inclusion Criteria: Patients aged 18 and above who presented with accidental ingestion of a toothbrush.

- **Data Collection:** Clinical data were collected from medical records, including:
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- Patient demographics (age, sex)
- Time of ingestion
- Symptoms at presentation
- Imaging studies performed
- Endoscopic findings and management strategies
- Outcomes and complications
- **Imaging Techniques:** Standard abdominal X-ray and CT scans were utilized to locate the foreign body and assess for potential complications.
- **Endoscopic Procedures:** Endoscopy was performed under local anaesthesia , with attempts to retrieve the foreign body using snares, graspers, and vicryl loops as necessary. Success was defined as the complete removal of the foreign body without complications.

RESULTS AND DISCUSSIONS

Case 1:

Patient Profile:

- A 21-year-old male presented with accidental ingestion of a toothbrush six hours prior. The patient reported no significant symptoms, including vomiting or abdominal distension. Physical examination revealed a soft, non-tender abdomen with normal bowel sounds. An abdominal X-ray showed no abnormalities.
- **Endoscopic Findings and Management:** An endoscopic evaluation revealed the toothbrush lodged at the gastroesophageal (GE) junction. Endoscopic removal was successfully performed using a snare. The patient experienced immediate relief following the procedure, with no complications reported.

Case 2:

Patient Profile:

- A 19-year-old male presented with a history of accidental toothbrush ingestion 1.5 months prior. He reported no significant symptoms at the time of presentation. Physical examination was unremarkable and an abdominal X-ray was normal. A CT scan revealed a linear hypodense foreign body measuring 18 x 0.9 cm in the stomach, extending from the fundus duodenum
- Endoscopic Findings and Management: During endoscopy, the toothbrush was found with the lower end in the fundus and bristles extending into the duodenum, alongside a significant food bolus. Initial attempts at retrieval using a snare were unsuccessful due to limited space. A vicryl loop was successfully threaded through a hole in

the toothbrush, facilitating its removal. The procedure was completed without any complications.

- Common techniques used during endoscopy include snares and grasping devices, though specialized techniques may be necessary for larger or irregularly shaped.

Fig. 1: Abdominal X-Ray/CT Scan Showing a Foreign Body (Toothbrush) in the Stomach

Fig. 2: Endoscopic Team Preparing for the Removal of the Ingested Toothbrush from the Patient

Fig. 3: Toothbrush Successfully Retrieved from the Stomach Through Endoscopic Management

The accidental ingestion of foreign bodies is a prevalent issue in clinical practice, often requiring prompt evaluation and intervention to prevent complications. The two cases presented in this series illustrate different clinical scenarios regarding toothbrush ingestion, highlighting the importance of timely management and the effectiveness of endoscopic retrieval techniques. In Case 1, the patient presented within six hours of ingestion, allowing for early intervention that significantly reduced the risk of complications such as obstruction or perforation. The imaging study showed no immediate signs of distress, enabling a swift endoscopic evaluation. The successful retrieval of the toothbrush using a snare demonstrates the efficacy of this technique, particularly for objects lodged in the gastroesophageal junction. Previous studies have shown that early intervention in foreign body ingestion cases correlates with better outcomes, reinforcing the need for prompt assessment and management. Conversely, Case 2 presented a more complex scenario with the patient ingesting the toothbrush 1.5 months prior to presentation. The prolonged retention of a foreign body increases the risk of complications, such as mucosal erosion, perforation, and secondary infection. In this case, imaging studies revealed a linear foreign body extending from the fundus to the duodenum, raising concerns about potential obstruction. The necessity for careful endoscopic management in such cases is underscored by the potential for serious complications associated with delayed intervention. The successful use of a vicryl loop to extract the toothbrush, after initial attempts with a snare failed, illustrates the need for flexibility and adaptability in managing foreign bodies. This case highlights the importance of advanced techniques and the necessity for clinicians to be prepared for unexpected challenges during endoscopic procedures. The use of endoscopic techniques for foreign body retrieval has become the standard of care in many institutions, with success rates reported between 80% and 90%. The choice of retrieval technique is influenced by the size, shape, and location of the ingested object. In Case 2, the vicryl loop technique was employed after initial attempts at removal with a snare were unsuccessful. This highlights the need for clinicians to be equipped with a range of tools and techniques to effectively manage various scenarios of foreign body ingestion. The absence of complications in both cases reinforces the safety and efficacy of endoscopic techniques in managing gastrointestinal foreign bodies. These cases also emphasize the importance of clinician awareness regarding the potential risks of foreign body ingestion and the need for timely intervention.

CONCLUSION

- The cases presented in this series underscore the significance of timely recognition and intervention in cases of accidental toothbrush ingestion, a situation that, while uncommon, can lead to severe complications if not managed appropriately. The two distinct cases highlighted the variability in presentation and management strategies, emphasizing the importance of a tailored approach to each individual case based on patient history, time elapsed since ingestion and clinical findings.

- These cases also provide insights into the broader implications for clinical practice. They highlight the necessity of thorough assessment, including appropriate imaging studies, which are essential in diagnosing foreign body ingestion and determining the most effective management strategy. A multi disciplinary approach involving gastroenterologists, radiologists and surgeons may be beneficial in complex cases, ensuring that all potential complications are addressed and appropriate interventions are applied.
- Moreover, the case series contributes to the existing literature on foreign body ingestion, which has primarily focused on children. The findings underscore the fact that adults are also at risk, particularly in specific behavioral contexts and that clinicians should maintain a high index of suspicion for foreign body ingestion in all age groups.
- The successful outcomes in both cases emphasize the effectiveness and safety of endoscopic retrieval as the preferred method for managing ingested foreign bodies. It is essential for medical professionals to remain informed about the latest techniques and technologies available for endoscopic procedures, as advancements in this field can lead to improved patient outcomes.
- In conclusion, these cases serve as a reminder of the importance of awareness and preparedness in managing foreign body ingestion. Clinicians should be equipped with knowledge about various retrieval techniques and the ability to assess and respond to complications promptly. By doing so, healthcare providers can significantly reduce the morbidity associated with foreign body ingestion and improve patient care.

Limitations of the Study: While this case series provides valuable insights into the management of accidental toothbrush ingestion, several limitations should be acknowledged:

- **Small Sample Size:** The findings are based on only two cases, which may limit the generalizability of the results.
- **Lack of Long-Term Follow-Up:** The case series did not include long-term follow-up data on the patients post-procedure.
- **Variability in Management:** The management approaches varied between the two cases, which may not be standard practice in all institutions.
- **Absence of Comparative Analysis:** This study does not include comparisons with alternative management strategies, such as surgical intervention.
- **Potential for Selection Bias:** The cases selected for this series may not represent all instances of toothbrush ingestion. Cases that were managed conservatively or those that resulted in complications may provide important insights that are not captured here.

In summary, while this case series adds to the understanding of accidental toothbrush ingestion and its management, further research is needed to confirm these findings and enhance the body of knowledge surrounding foreign body ingeston in both adult and pediatric populations.

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