

Cyanoacrylate glue-assisted endoscopic extraction of a large esophageal stone in an adult

Srinu Deshidi¹, Gaurav Mahajan², Viswanath Kamisetty¹, Spoorthi Kolla¹, Venu Gongati¹, Harsha Vardhan Reddy Gongala¹, Bhaskar Kante¹, Sreekanth Appasani¹

From ¹Consultant, Department of Gastroenterology, Krishna Institute of Medical Sciences, Hyderabad, Telangana, ²Associate Professor, Department of Gastroenterology, Indian Naval Hospital Ship Asvini, Mumbai, Maharashtra, India

ABSTRACT

Foreign body ingestion is a common reason for emergency department visits, particularly in children, but also occurs in adults with psychiatric disorders, cognitive impairment, or intoxication. We report the case of a 30-year-old male with intellectual developmental disorder who presented with chest pain and dysphagia following ingestion of a large stone. Imaging revealed a triangular-shaped opacity in the superior mediastinum, and endoscopy confirmed a large stone in the upper esophagus. Initial attempts to grasp the stone using a snare were unsuccessful due to its slippery surface and lack of adequate space to fully open the instrument. The stone was gently pushed into the stomach and attempted removal using rat-tooth forceps, retrieval nets, basket, and snare, but these were unsuccessful due to the stone's large size and slippery surface, where application of n-butyl-2-cyanoacrylate glue created a rough surface that enabled secure grasping with a polypectomy snare. The stone was successfully extracted, with only minor mucosal injury. This case demonstrates the innovative use of cyanoacrylate glue as an adjunct to facilitate endoscopic removal of slippery foreign bodies.

Key words: Cyanoacrylate glue, Foreign body, Large stone

Foreign body (FB) ingestion is a frequent reason for emergency department visits. While it is more common in the pediatric population and typically accidental, in adults, it often occurs in individuals with psychiatric disorders, the elderly, those under the influence of alcohol, and prisoners [1]. In adults, the most commonly ingested foreign bodies are fish bones (9–45%), other bones (8–40%), and dentures (4–18%) [2]. Guidelines recommend plain radiography to evaluate the presence, location, size, shape, and number of ingested foreign bodies when radiopaque objects are suspected or the type of object is unknown, while computed tomography is reserved for patients with suspected perforation or other complications that may require surgical intervention [3]. Flexible endoscopy is the first-line approach for managing esophageal foreign bodies and is associated with a high success rate. Choosing suitable extraction devices, such as a snare, basket, retrieval net, or rat-tooth forceps, depends on the type and location of the ingested FB. Cyanoacrylates are synthetic adhesives that rapidly solidify upon contact with weak bases such as water or blood. When sprayed onto a surface, the glue hardens and creates a rough


texture, providing a safe and effective option for retrieving sharp, smooth, or slippery foreign bodies in selected cases [4]. We are reporting this case due to the exceptionally rare occurrence of stone ingestion, especially of such a large size (5 × 4 cm), and the innovative use of n-butyl-2-cyanoacrylate glue to alter the stone's surface texture and facilitate its successful endoscopic removal.

CASE PRESENTATION

A 30-year-old male patient with an intellectual developmental disorder presented with complaints of acute onset dull aching retrosternal pain, and dysphagia after ingesting a stone.

On examination, his vitals were stable. X-ray neck and chest revealed a large triangular-shaped opacity in the superior mediastinum (Fig. 1). Esophagogastroduodenoscopy was performed under conscious sedation with the patient positioned in the left lateral decubitus position, following written informed consent from the parents.

The procedure revealed a large, flat, gray-colored stone lodged in the upper esophagus, causing localized mucosal injury (Fig. 2a). Initial attempts to grasp the stone using a snare were unsuccessful due to its slippery surface and lack of adequate

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Correspondence to: Srinu Deshidi, Consultant, Department of Gastroenterology, Krishna Institute of Medical Sciences, Hyderabad - 500 003, Telangana, India. E-mail: Srinu.deshidi@gmail.com

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space to fully open the instrument. As a result, the stone was gently pushed into the stomach without causing significant mucosal damage (Fig. 2b). In the stomach, we attempted removal using a rat-tooth forcep, retrieval nets, basket, and snare, but these were unsuccessful due to the stone's large size (5×4 cm) and slippery surface. Therefore, we applied n-butyl-2-cyanoacrylate glue (Samarth Life Sciences, Mumbai, Maharashtra, India) to the stone's surface using a 21G endoscopic injection needle (Fig. 3a). As the glue solidified, it created a rougher texture (Fig. 3b), this allowed the polypectomy snare (US Endoscopy, Mentor, Ohio, United States) to securely grasp the stone, enabling its safe removal (Fig. 4a). Stone extraction was challenging at the

gastroesophageal junction (GEJ) due to the stone's size. Gentle clockwise and counterclockwise movements of the scope, along with sustained traction, allowed successful removal. The stone was found to be 5×4 cm in size after removal (Fig. 4b). A mild mucosal tear with minimal oozing was noted, which resolved spontaneously. The patient reported mild throat discomfort.

A repeat endoscopy the next day confirmed mild mucosal tears at the GEJ and upper esophagus. Symptoms were managed with oral sucralfate syrup, pantoprazole 40 mg once daily, and discharged.

DISCUSSION

Acute-onset dysphagia is a common reason for patients to visit the emergency department. The primary causes of acute dysphagia include FB ingestion, infectious esophagitis, pill-induced esophagitis, and corrosive esophagitis. A thorough history and physical examination are essential to establish a diagnosis. The index patient had a history of stone ingestion before the onset of chest pain and dysphagia. Ingestion of an FB is a common occurrence. FB ingestions include food bolus (mostly meat), fish or chicken bones, dentures, coins, batteries, toys, and stones.

The esophagus is the most common site for acute FB impaction in the gastrointestinal tract. Overall, 28–68% of gastrointestinal foreign bodies are found in the esophagus, with the upper third of the esophagus being the most common site of impaction [5]. The majority of ingested foreign bodies pass spontaneously, with only about 20% of cases requiring endoscopic intervention and only approximately 1% requiring surgery [6]. However, in intentional ingestion, the need for endoscopic management rises significantly, occurring in roughly 63–76% of cases, while surgical intervention is necessary in approximately 12–16% of cases [7].

Accidental ingestion of objects is common in children. In adults, it often occurs in the setting of intoxication or elderly individuals with cognitive decline. Intentional ingestion is also frequently observed in patients with psychiatric disorders and among prisoners [8]. The index patient has a hearing and speech impairment along with intellectual disability, and the stone was impacted in the upper esophagus.

Clinical symptoms can vary and may include chest or abdominal pain, vomiting, dysphagia, odynophagia, throat discomfort, and bleeding, depending on the site of impaction and the characteristics of the ingested object. Interestingly, 30% of the patients may be asymptomatic [9]. Without treatment, complications may



Figure 1: X-ray neck with chest showing triangular opacity in the superior mediastinum

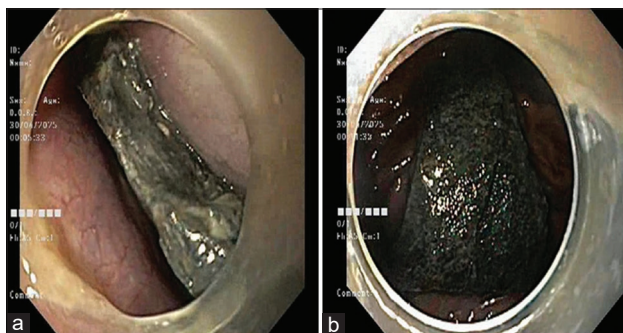


Figure 2: (a) Endoscopy image showing a large, flat stone in the upper part of esophagus just below the upper esophageal sphincter; (b) Endoscopy image showing a large, flat, triangular stone in the stomach

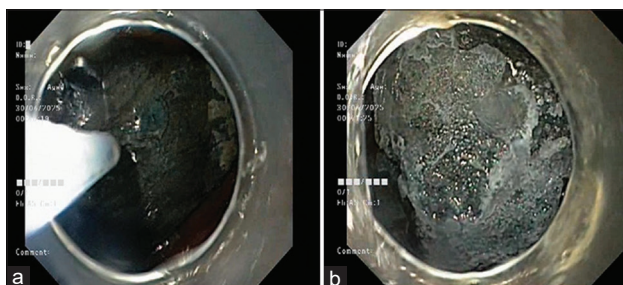


Figure 3: (a) Endoscopy image showing glue injection on stone surface with endoscopic injection needle; (b) Endoscopy image showing appearance of stone after glue solidification



Figure 4: (a) Endoscopic image showing stone captured with snare; (b) image showing stone size as 5×4 cm

arise, including ulceration, bleeding, perforation, obstruction, esophageal-aortic fistula, tracheoesophageal fistula formation, and sepsis [10].

X-ray is widely recommended as an initial diagnostic tool in the evaluation of FB ingestion due to its advantages of availability, low cost, and disadvantages of other imaging techniques (magnetic resonance imaging, computed tomography, and ultrasound) including cost, radiation exposure, and expertise/equipment required for performance and interpretation [11]. In our patient, an X-ray chest and neck was suggestive of a large triangular opacity noted in the superior mediastinum.

The necessity and timing of intervention for FB ingestion depend on factors such as the patient's age and clinical status, as well as the size, shape, composition, anatomical location of the object, and the time elapsed since ingestion [3]. Most ingested foreign bodies are best treated with flexible endoscopes. Removal with flexible endoscopes has a high success rate and can be performed with conscious sedation in most adults. Various retrieval devices have been used, including rat-tooth and alligator forceps, polypectomy snares, polyp graspers, Dormier baskets, retrieval nets, magnetic probes, and friction-fit adaptors or banding caps [12]. In our patient, we attempted removal using a rat-tooth forcep, retrieval nets, basket, and snare, but these were unsuccessful due to the stone's large size (5 × 4 cm) and slippery surface.

Cyanoacrylates are synthetic adhesives that quickly harden upon contact with weak bases like water or blood. They are commonly used for variceal obliteration and fistula closure [13]. Glue spray is a safe alternative in specific cases of sharp, smooth, or slippery surface FB retrieval [4]. To the best of our knowledge, this is the largest esophageal stone extracted to date using flexible endoscopy.

CONCLUSION

This case highlights a rare and challenging instance of esophageal impaction of a large stone in a patient with intellectual developmental disorder. While standard endoscopic retrieval techniques were unsuccessful due to the size and slippery nature of the FB, the innovative use of n-butyl-2-cyanoacrylate glue facilitated secure grasping and successful extraction without the need for surgical intervention. This report emphasizes the value of tailored, resourceful techniques in challenging FB removals

and highlights cyanoacrylate glue as a viable adjunct for smooth or difficult-to-grasp objects in select cases.

REFERENCES

1. Tambakis G, Schildkraut T, Delaney I, Gilmore R, Loebenstein M, Taylor A, *et al.* Management of foreign body ingestion in adults: Time to STOP and rethink endoscopy. *Endosc Int Open* 2023;11:E1161-7.
2. Ambe P, Weber SA, Schauer M, Knoefel WT. Swallowed foreign bodies in adults. *Dtsch Arztebl Int* 2012;109:869-75.
3. Birk M, Bauerfeind P, Deprez PH, Häfner M, Hartmann D, Hassan C, *et al.* Removal of foreign bodies in the upper gastrointestinal tract in adults: European society of gastrointestinal endoscopy (ESGE) clinical guideline. *Endoscopy* 2016;48:489-96.
4. Reddy YR, Mogili KR, Burra NG, Narayankar SM, Donapati VR, Rao GR. A novel method of esophageal impacted sharp foreign body retrieval. *J Dig Endosc* 2022;13:44-5.
5. Ashraf O. Foreign body in the esophagus: A review. *Sao Paulo Med J* 2006;124:346-9.
6. Pellerin D, Fortier-Beaulieu M, Gueguen J. The fate of swallowed foreign bodies: Experience of 1250 instances of subdiaphragmatic foreign bodies in children. *Prog Pediatr Radiol* 1969;2:286-302.
7. ASGE Standards of Practice Committee, Ikenberry SO, Jue TL, Anderson MA, Appalaneni V, Banerjee S, *et al.* Management of ingested foreign bodies and food impactions. *Gastrointest Endosc* 2011;73:1085-91.
8. Chirica M, Kelly MD, Siboni S, Aiolfi A, Riva CG, Asti E, *et al.* Esophageal emergencies: WSES guidelines. *World J Emerg Surg* 2019;14:26.
9. Mathew RP, Sarasamma S, Jose M, Toms A, Jayaram V, Patel V, *et al.* Clinical presentation, diagnosis and management of aerodigestive tract foreign bodies in the adult population: Part 1. *SA J Radiol* 2021;25:2022.
10. Fung BM, Sweetser S, Wong Kee Song LM, Tabibian JH. Foreign object ingestion and esophageal food impaction: An update and review on endoscopic management. *World J Gastrointest Endosc* 2019;11:174-92.
11. Guelfguat M, Kaplinskiy V, Reddy SH, DiPoce J. Clinical guidelines for imaging and reporting ingested foreign bodies. *AJR Am J Roentgenol* 2014;203:37-53.
12. Nelson DB, Bosco JJ, Curtis WD, Faigel DO, Kelsey PB, Leung JW, *et al.* ASGE technology status evaluation report. Endoscopic retrieval devices. February 1999. American society for gastrointestinal endoscopy. *Gastrointest Endosc* 1999;50:932-4.
13. ASGE Technology Committee, Bhat YM, Banerjee S, Barth BA, Chauhan SS, Gottlieb KT, *et al.* Tissue adhesives: Cyanoacrylate glue and fibrin sealant. *Gastrointest Endosc* 2013;78:209-15.

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