

Diagnosis, treatment, and management of esophageal foreign bodies in patients with mental retardation: A retrospective study from three centers

Zihinsel engelli hastalarda özofagus yabancı cisimlerinin tanı, tedavi ve yönetimi: Üç merkezden retrospektif bir çalışma

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ABSTRACT

Background: This study aims to assess the outcomes and prognosis of surgical interventions aimed at removing esophageal foreign bodies in patients with mental retardation.

Methods: Between January 2010 and January 2021, a total of 30 consecutive patients (20 males, 10 females; median age: 29.5 years; range, 2 to 57 years) with mental retardation who were diagnosed with esophageal foreign bodies and underwent surgical treatment were retrospectively analyzed. Age and sex of the patients, symptoms, type of the foreign body, esophageal stricture level, methods used for preoperative diagnosis, type of surgical procedure, postoperative complications, and length of hospital stay were recorded.

Results: Seventeen (56.6%) patients had a foreign body in the first narrowing, 12 (40%) in the second narrowing, and one (3.3%) in the third narrowing. A rigid esophagoscopy was performed in all cases. However, successful removal was not achieved in two (6.6%) cases, and foreign bodies were removed through cervical esophagotomy in one (3.3%) patient and through esophagotomy with right thoracotomy in one (3.3%) patient. Postoperative complications included esophagitis in seven patients (23.3%) and wound infection and pneumonia in two patients (6.6%). The median length of hospital stay after treatment was 1.09 days in patients without complications and 3.3 days in patients with complications. There was a significant correlation between the occurrence of complications and the length of hospital stay ($p=0.002$). The foreign body was successfully removed in all patients, and no mortality was observed.

Conclusion: Early diagnosis and emergency intervention can reduce complications, particularly considering the possibility of non-food and sharp-edged foreign bodies that pose a higher risk of damaging the digestive system, in patients with mental retardation than those without such conditions.

Keywords: Complications, esophageal foreign body, management, mental retardation.

ÖZ

Amaç: Bu çalışmada zihinsel engeli olan hastalarda özofagusta kalan yabancı cisimlerin çıkarılması için yapılan cerrahi müdahalelerin sonuçları ve prognozu değerlendirildi.

Çalışma planı: Ocak 2010 - Ocak 2021 tarihleri arasında özofagusta yabancı cisim tanısı konulan ve cerrahi tedavi uygulanan 30 zihinsel engelli hasta (20 erkek, 10 kadın; medyan yaş: 29.5 yıl; dağılım, 2-57 yıl) retrospektif olarak incelendi. Hastaların yaşı ve cinsiyeti, semptomlar, yabancı cisim türü, özofageal striktür düzeyi, ameliyat öncesi tanıda kullanılan yöntemler, cerrahi işlem türü, ameliyat sonrası komplikasyonlar ve hastanede kalış süresi kaydedildi.

Bulgular: On yedi (%56.6) hastada özofagus birinci darlıkta, 12 (%40) hastada ikinci darlıkta ve bir (%3.3) hastada üçüncü darlıkta yabancı cisim izlendi. Tüm olgulara rijit özofagoskopi uygulandı. Ancak iki (%6.6) hastada başarı sağlanamadı ve bir (%3.3) hastaya servikal özofagotomi ve bir (%3.3) hastaya sağ torakotomi ile özofagotomi uygulanarak yabancı cisimler çıkarıldı. Ameliyat sonrası komplikasyonlar arasında yedi (%23.3) hastada özofajit ve iki (%6.6) hastada yara yeri enfeksiyonu ve pnömoni görüldü. Tedavi sonrası medyan hastanede kalış süresi komplikasyon gelişmeyen hastalarda 1.09 gün ve komplikasyon gelişen hastalarda 3.3 gün idi. Komplikasyon gelişimi ile hastanede kalış süresi arasında anlamlı bir ilişki saptandı ($p=0.002$). Tüm hastalarda yabancı cisim başarıyla çıkarıldı ve mortalite gözlenmedi.

Sonuç: Zihinsel engelli hastalarda bu tür durumlar olmayanlara kıyasla özellikle gıda dışı ve keskin kenarlı yabancı cisimlerin sindirim sistemine zarar verme riskinin daha yüksek olması olasılığı göz önüne alındığında, erken tanı ve acil müdahale komplikasyonları azaltabilir.

Anahtar sözcükler: Komplikasyonlar, özofagus yabancı cismi, tedavi, zeka geriliği.

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Esophageal foreign bodies (EFBs) refer to substances, including medications, food items, or inorganic materials, which are ingested accidentally or intentionally and lodged within the esophagus.^[1] This common condition requires early diagnosis and immediate intervention, as it has the potential to result in a wide range of complications, including mucosal ulceration, esophageal perforation, mediastinitis, tracheoesophageal fistula, and aortoesophageal fistula, all of which can be fatal.^[1,2] Invasive procedures are required in only 10 to 20% of the patients, as foreign bodies are often expelled from the body without complications due to the slippery structure of the digestive tract.^[3,4] In the adult age group, foreign body retention in the esophagus usually occurs accidentally.^[1] Since patients with intellectual disabilities, who constitute a special group of patients, tend to manipulate objects with their hands and put them into their mouths, non-food objects may also be encountered as EFBs.^[5] They are also susceptible to eating disorders and are at risk of experiencing obstruction once incompletely chewed food, nuts, or animal bones are lodged in the esophagus, representing the narrowest segment of the upper gastrointestinal tract.^[6]

In the present study, we aimed to evaluate our experience with EFBs in patients with mental retardation who underwent rigid esophagoscopy and esophageal surgery for foreign body retrieval.

PATIENTS AND METHODS

This multi-center, retrospective study was conducted at Department of Thoracic Surgery of

three centers between January 2010 and January 2021. Among 1,048 patients who were admitted to our hospital with EFBs, a total of 30 consecutive Caucasian patients (20 males, 10 females; median age: 29.5 years; range, 2 to 57 years) with mental retardation who were diagnosed with EFBs and underwent surgical treatment were included.

The data evaluated included age, sex, symptoms, type of the foreign body, esophageal stricture level where the foreign body stays in the esophagus, methods used for preoperative diagnosis, type of surgical procedure, postoperative complications, and length of hospital stay.

Statistical analysis

Statistical analysis was performed using the IBM SPSS for Windows version 25.0 software (IBM Corp., Armonk, NY, USA). Continuous variables were presented in mean \pm standard deviation (SD) or median (min-max), while categorical variables were presented in number and frequency. The chi-square correlation test was used to test whether there was a relationship between two independent classification variables. A *p* value of <0.05 was considered statistically significant.

RESULTS

Of a total of 30 patients, three (10%) were diagnosed with Down syndrome. The period between foreign body ingestion and treatment was 0-1 day (11 patients presented one day after foreign body ingestion). All cases were symptomatic at presentation. Among these patients, 28 presented with dysphagia, five had

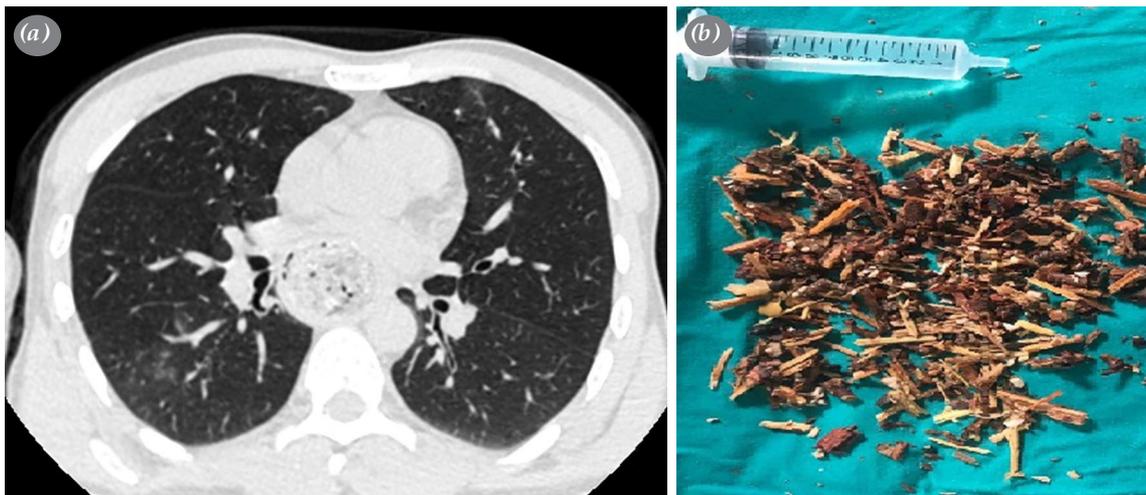


Figure 1. (a) The furniture pieces in the esophagus on thoracic computer tomography and (b) images of the pieces removed after esophagoscopy.

Table 1. Demographic and clinical characteristics

Patient no	Sex/Age (year)	MR type	Complaint	Time to presentation after symptom onset	Surgical procedure	Type of foreign body	Site of narrowing where foreign body became lodged	Diagnostic method	Days of hospitalization	Complication
1	M/34	MR	Dysphagia hypersalivation	1	EFB removal by RE + right thoracotomy	Stone and marbles	2.	CT	7	Wound site infection + pneumonia
2	M/2	DOWN	Difficulty swallowing	0	EFB removal by RE	Stone	2.	CT	1	No
3	M/25	MR	Difficulty swallowing	0	EFB removal by RE	Bone	1.	Direct X-ray	1	No
4	M/24	MR	Cough	0	EFB removal by RE	Stone	2.	CT	1	No
5	F/5	DOWN	Stinging sensation when swallowing	0	EFB removal by RE	Bulk needle	2.	CT	1	No
6	M/54	MR	Difficulty swallowing	0	EFB removal by RE	Bone	1.	CT	3	Esophagitis
7	M/14	MR	Difficulty swallowing	0	EFB removal by RE	Piece of fruit	2.	CT	1	No
8	F/30	DOWN	Difficulty swallowing	0	EFB removal by RE	Bone	1.	Direct X-ray	2	No
9	M/19	MR	Difficulty swallowing	1	EFB removal by RE	Marble	2.	CT	1	No
10	F/18	MR	Difficulty swallowing	1	EFB removal by RE	Bone	1.	CT	2	No
11	F/20	MR	Difficulty swallowing	1	EFB removal by RE	Marble	2.	CT	1	No
12	F/26	MR	Difficulty swallowing	1	EFB removal by RE	Bone	1.	Direct X-ray	1	No
13	M/33	MR	Difficulty swallowing	0	EFB removal by RE	Bone	1.	CT	1	No
14	F/52	MR	Difficulty swallowing	1	EFB removal by RE	Bone	1.	CT	2	Esophagitis
15	F/33	MR	Dysphagia hypersalivation	0	EFB removal by RE	Bone	1.	Direct X-ray	1	No
16	M/26	MR	Difficulty swallowing	1	EFB removal by RE	Ringed needle	2.	CT	1	No
17	M/22	MR	Difficulty swallowing	1	EFB removal by RE	Bone	1.	CT	1	No
18	M/42	MR	Difficulty swallowing	1	EFB removal by RE	Bone	1.	CT	1	Esophagitis
19	M/30	MR	Difficulty swallowing	1	EFB removal by RE	Bone	2.	CT	3	Esophagitis
20	M/49	MR	Difficulty swallowing	0	EFB removal by RE	Bone	1.	CT	2	No
21	M/36	MR	Dysphagia hypersalivation	1	EFB removal by RE	Piece of furniture	2.	CT	2	Esophagitis
22	M/19	MR	Dysphagia hypersalivation	1	EFB removal by RE + cervical esophagotomy	Shelled whole walnuts	2.	CT	8	Wound site infection + pneumonia
23	F/19	MR	Difficulty swallowing	0	EFB removal by RE	Bone	1.	CT	1	Esophagitis
24	M/57	MR	Difficulty swallowing	0	EFB removal by RE	Fruit kernel	2.	CT	1	No
25	F/12	MR	Difficulty swallowing	0	EFB removal by RE	Pacifier	1.	CT	1	No
26	M/34	MR	Difficulty swallowing	0	EFB removal by RE	Bone	1.	CT	1	No
27	F/39	MR	Dysphagia hypersalivation	0	EFB removal by RE	Bone	3.	CT	3	Esophagitis
28	M/42	MR	Difficulty swallowing	0	EFB removal by RE	Bone	1.	CT	1	No
29	M/37	MR	Difficulty swallowing	0	EFB removal by RE	Bone	1.	CT	1	No
30	M/29	MR	Difficulty swallowing	0	EFB removal by RE	Stone	1.	CT	1	No

MR: Mental retardation; EFB: Esophageal foreign body; RE: Rigid esophagoscopy; CT: Computed tomography.

hypersalivation, one reported a stinging sensation while swallowing, and one had a cough. In four cases, the diagnosis was established solely through direct radiography, while in the remaining cases, thoracic computed tomography (CT) was additionally used for diagnosis. Figure 1 shows the furniture pieces within the thoracic esophagus on thoracic CT scans (A) and the furniture pieces following their removal through esophagoscopy (B).

A rigid esophagoscopy was performed in all cases. In two (6.6%) patients, the foreign body could not be removed through rigid esophagoscopy. Right thoracotomy and esophagotomy were performed in one patient who swallowed stones and marbles, and cervical esophagotomy was performed in another patient who swallowed whole walnut in shell. The success rate of esophagoscopy was 93.3%. The patient who swallowed a whole walnut in the shell was found to have destroyed a saturation probe during intensive care unit (ICU) follow-up, and the foreign body was removed through rigid esophagoscopy.

The most common foreign bodies included bone (n=17, 56.6%), stone (n=4, 13.3%), and marble (n=3, 10%). The sites of esophageal narrowing where the foreign bodies became lodged were as follows: the first site of narrowing in 17 (56.6%) patients, the second site of narrowing in 12 (40%) patients, and the third narrowing in one (3.3%) patient. Postoperative complications included esophagitis in seven patients (23.3%) and wound infection and pneumonia in two patients (6.6%). The median length of hospital stay after treatment was 1.09 days in cases without complications. However, the median length of hospital stay was 3.3 days in cases with complications. There was a significant correlation between the occurrence of complications and the length of hospital stay ($p=0.002$). The foreign body was successfully removed in all patients, and no mortality was observed. Table 1 shows demographic and clinical data of the patients.

DISCUSSION

Esophageal foreign body ingestion is one of the most frequently encountered emergencies, with patients able to recover successfully through early diagnosis and treatment without complications.^[7] While it is frequently observed in childhood, its occurrence in adulthood is relatively low.^[8] It can often be caused by psychiatric disorders and intellectual disability/neurodevelopmental delay in advanced ages.^[9] It may occur intentionally in developing children and elderly patients or adults and prisoners, or it may occur unintentionally in patients with mental

retardation due to hallucinations.^[10] The patients in our study had intellectual disabilities, and most were in the adult age group. Kaazan et al.,^[11] in their multi-center study in which they shared their eight-year experience with EFBs, showed that underlying mental problems were present in 21% of EFBs in adults. In a study reporting on a 20-year experience, Çelik et al.^[12] found that 18.8% of patients presenting with EFB retention had accompanying mental health problems. In our study, it was observed that four patients were in the pediatric age group and 26 patients were adult patients. And in our study, a rate of 2.4% was observed.

The type of swallowed foreign body can vary. The nature, size, and location of EFB affect the likelihood of having symptoms and/or complications and, as a result, the management of patients. Higher risk of EFB in mentally retarded patients is associated with various reasons, including poor hand-mouth coordination, discovery of objects, prolonged oral phase, and limited control over objects placed in the oral cavity, and dysphagia.^[9] While coins are the primary foreign bodies ingested by children, adults most commonly encounter large pieces of food, particularly meat, as the most common foreign bodies.^[13] Similar to that observed in children, bone and non-food foreign bodies were predominant in our cases. Meaty foods should be separated from their bones and given as food to mentally retarded patients and their access to any non-food object that can fit into the oral cavity and be swallowed should be prevented. Individuals who take care of them should be careful in this matter.

Details regarding the foreign body and the time of ingestion can be usually obtained from most adult and adolescent age groups. Infants, young children, mentally disabled individuals, or prisoners might face difficulties or be unwilling to provide a medical history.^[14] Therefore, in the presence of sudden severe dysphagia in such patients, it is necessary to consider EFB ingestion and to take a detailed anamnesis that allows us to reach the diagnosis.^[15] Dysphagia and hypersalivation were the most common symptoms in our patients, all of whom were symptomatic. However, due to the limited ability of this patient group to communicate like individuals without disabilities, some of them were hospitalized a day after the potential ingestion of the foreign body. Therefore, informing the relatives of individuals with intellectual disabilities about the symptoms that may occur due to EFBs may be effective in early presentation and early intervention.

In case of diagnosis delays and misdiagnoses, serious complications and even life-threatening conditions may develop due to the foreign body, and medico legal problems may occur.^[9] The possibility of EFB should be considered in patients with mental retardation, even in the absence of a feature in the anamnesis and/or in the absence of a direct witness to the event.

As our study primarily focused on EFBs in people with mental retardation, we could not evaluate the factors affecting the occurrence of complications because of the small number of cases. Many studies in the literature evaluated the factors such as the type of foreign body, its dimensions, and the duration of retention in the esophagus as potential elements influencing the occurrence of complications.^[6,12,13,16] Esophageal foreign bodies are an important clinical condition encountered in all age groups. According to the type of EFBs, there may be objects that can lead to life-threatening complications and be difficult to remove.^[17] About 10 to 20% of swallowed objects are removed by endoscopy, while less than 1% require surgical intervention. Surgical intervention is indicated in cases of perforation, obstruction, organ injury and foreign body stuck in the surrounding tissues.^[10] In cases with mental retardation, early intervention is necessary to prevent complications by remembering that the retention time may be prolonged due to inadequate medical history and the possibility of non-food sharp-edged foreign bodies having been ingested. However, no consensus exists on the most optimal way to remove an EFB. The main goal should be to prevent complications caused by foreign bodies. Gastroenterologists advocate flexible instruments, while surgeons prefer rigid esophagoscopy. However, due to high detection, low complication and high success rates, both can be recommended in treatment.^[18] We preferred rigid esophagoscopy under general anesthesia in all of the cases included in our study, as patients with mental retardation were not able to cooperate effectively during the foreign body removal procedure, and we anticipated that sudden movements by patients might lead to complications and our success rate in foreign body removal with rigid esophagoscopy was 93.3%. None of the patients developed major complications such as perforation or mediastinitis, but minor complications prolonged hospitalization. Due to its high success rate and low complication rates, we believe that rigid esophagoscopy under general anesthesia should be preferred for EFB removal in patients with mental retardation.

As the application period of patients increases, they may present with esophageal perforation depending on the shape and size of the foreign body. Additionally, during EFB removal, the risk of perforation may increase depending on the shape and size of the foreign body. Therefore, it is of great importance to remove the foreign body in the first 24 h to prevent the risk of perforation. If there is perforation in the esophagus, primary repair of the esophagus without wasting time is extremely important to prevent morbidity and mortality.

The study has various limitations. First of all, since the study is retrospective, data were extracted from discharge summaries and medical records. Secondly, the sample size in the study is small. Thirdly, the study period covers a long period of time. Fourth and lastly, due to the mental retardation of the cases, anamnesis was taken from kin of the patients and the possibility that these anamnesis were not sufficient is among the limitations of the study.

In conclusion, since patients with mental retardation with esophageal foreign bodies cannot fully express their complaints, both relatives and clinicians should be vigilant in these patients, particularly in the presence of sudden onset of dysphagia and hypersalivation. Considering these objects may be non-food and sharp-edged foreign bodies, early diagnosis and urgent intervention should be made. Rigid esophagoscopy under general anesthesia by experienced physicians can remove foreign bodies with minimal complications.

Ethics Committee Approval: The study protocol was approved by the Karadeniz Technical University Faculty of Medicine Scientific Research Ethics Committee (date: 10.05.2023, no: 2023/82). The study was conducted in accordance with the principles of the Declaration of Helsinki.

Patient Consent for Publication: Written informed consent was obtained from the legally responsible kin of the patients for publication.

Data Sharing Statement: The data that support the findings of this study are available from the corresponding author upon reasonable request.

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REFERENCES

1. Hong KH, Kim YJ, Kim JH, Chun SW, Kim HM, Cho JH. Risk factors for complications associated with upper gastrointestinal foreign bodies. *World J Gastroenterol* 2015;21:8125-31. doi: 10.3748/wjg.v21.i26.8125.
2. Li ZS, Sun ZX, Zou DW, Xu GM, Wu RP, Liao Z. Endoscopic management of foreign bodies in the upper-GI tract: Experience with 1088 cases in China. *Gastrointest Endosc* 2006;64:485-92. doi: 10.1016/j.gie.2006.01.059.
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. doi: 10.1055/s-0042-100456.
4. Webb WA. Management of foreign bodies of the upper gastrointestinal tract: Update. *Gastrointest Endosc* 1995;41:39-51. doi: 10.1016/s0016-5107(95)70274-1.
5. Orji FT, Akpeh JO, Okolugbo NE. Management of esophageal foreign bodies: Experience in a developing country. *World J Surg* 2012;36:1083-8. doi: 10.1007/s00268-012-1510-7.
6. Wei W, Qiu HR, Wang HX, Xue FS. Anesthesia and airway managements for emergency removal of esophageal foreign body in a trisomy 21 patient with mental retardation and predicted difficult airway: A case report. *Medicine (Baltimore)* 2020;99:e23710. doi: 10.1097/MD.00000000000023710.
7. Topaloğlu Ö, Akdoğan A, Karapolat S, Türkyılmaz A. A rare case of esophageal foreign bodies. *Türk Gogus Kalp Dama* 2022;30:136-7. doi: 10.5606/tgkdc.dergisi.2022.21596.
8. Ambe P, Weber SA, Schauer M, Knoefel WT. Swallowed foreign bodies in adults. *Dtsch Arztebl Int* 2012;109:869-75. doi: 10.3238/arztebl.2012.0869.
9. Destro F, Caruso AM, Mantegazza C, Maestri L, Meroni M, Pederiva F, et al. Foreign body ingestion in neurologically impaired children: A challenging diagnosis and management in pediatric surgery. *Children (Basel)* 2021;8:956. doi: 10.3390/children8110956.
10. Yıldız İ, Koca YS, Avşar G, Barut İ. Tendency to ingest foreign bodies in mentally retarded patients: A case with ileal perforation caused by the ingestion of a teaspoon. *Case Rep Surg* 2016;2016:8075432. doi: 10.1155/2016/8075432.
11. Kaazan P, Seow W, Tan Z, Logan H, Philpott H, Huynh D, et al. Deliberate foreign body ingestion in patients with underlying mental illness: A retrospective multicentre study. *Australas Psychiatry* 2023;31:619-24. doi: 10.1177/10398562231189431.
12. Celik S, Aydemir B, Tanrikulu H, Okay T, Doğusoy I. Çocuklarda ve erişkinlerde özofagus yabancı cisimleri: 20 yıllık deneyim. *Ulus Travma Acil Cerrahi Derg* 2013;19:229-34. doi: 10.5505/tjtes.2013.22687.
13. Triadafilopoulos G, Roorda A, Akiyama J. Update on foreign bodies in the esophagus: Diagnosis and management. *Curr Gastroenterol Rep* 2013;15:317. doi: 10.1007/s11894-013-0317-5.
14. Schaefer TJ, Trocinski D. Esophageal foreign body. 2023 Jan 30. In: *StatPearls [Internet]*. Treasure Island (FL): StatPearls Publishing; 2023.
15. Dadá MSAC, Dadá AHM, Dadá ZMS. Unusual case of intentional ingestion of foreign body in patient with mental retardation: Caso incomum de ingestão intencional de corpo estranho em paciente com transtorno mental. *Brazilian Journal of Health Review* 2022;5:17069-74. doi: 10.34119/bjhrv5n4-258.
16. Wang X, Su S, Chen Y, Wang Z, Li Y, Hou J, et al. The removal of foreign body ingestion in the upper gastrointestinal tract: A retrospective study of 1,182 adult cases. *Ann Transl Med* 2021;9:502. doi: 10.21037/atm-21-829.
17. Aydın Y, Ulaş AB, Eroğlu A. Coexistence of two rare esophageal foreign bodies: Marble ball and stone. *Türk Gogus Kalp Dama* 2023;31:425-6. doi: 10.5606/tgkdc.dergisi.2023.23459.
18. Li D, Nan L, Niu K, Yin W, Zhu W, Wang X. Failure of standard methods for retrieving an unusual foreign body in esophagus: A case report. *Medicine (Baltimore)* 2019;98:e18105. doi: 10.1097/MD.00000000000018105.