



# Foreign body impaction in esophagus: experiences at Ear-Nose-Throat Clinic in Tuzla, 2003-2013

## Özofagusta yabancı cisim takılması: 2003-2013 Tuzla, Kulak-Burun-Boğaz Kliniğinde deneyimler

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### ABSTRACT

**Objectives:** This study aims to report our experience in the management of foreign body (FB) impaction in esophagus in the Ear-Nose-Throat Clinic, University Clinical Center of Tuzla, Bosnia and Herzegovina.

**Patients and Methods:** Seventy-one patients (44 males, 27 females; mean age 32.99±28.57 years; range 1 to 81 years) who admitted to our clinic between January 2003 and December 2013 with a history of a FB in esophagus were retrospectively analyzed including head and neck examination. All patients were performed rigid esophagoscopy under general anesthesia.

**Results:** A total of 32 FBs were detected in children (23 males, 9 females; mean age 4.6 years; range 1 to 11, mod 1) with coins being the most common (56.31%). A total of 39 FBs were detected in adults (21 males, 18 females; mean age 56.2 years; range 16 to 81) with bones and food being the most common (43.6%). Foreign bodies impacted in the upper esophageal sphincter in 87.5% of children and in 66.7% of adults. The duration of localization of FBs in esophagus was between one hour and six months. All procedures were performed without complications; the FBs were completely extracted without the requirement to repeat the procedure.

**Conclusion:** Our study results suggest that use of rigid endoscope is reliable in removing FBs in the esophagus.

**Keywords:** Adult; child; esophagoscopy; foreign body impaction.

### ÖZ

**Amaç:** Bu çalışmada Tuzla, Bosna Hersek'teki University Clinical Center Kulak-Burun-Boğaz Kliniğinde özofagusa takılan yabancı cisim (YC) yönetimine ilişkin deneyimimiz sunuldu.

**Hastalar ve Yöntemler:** Özofagusta YC öyküsüyle Ocak 2003 - Aralık 2013 tarihleri arasında kliniğimize başvuran 71 hasta (44 erkek, 27 kadın; ort. yaş 32.99±28.57 yıl; dağılım 1-81 yıl) baş ve boyun muayenesi dahil olmak üzere retrospektif olarak incelendi. Tüm hastalara genel anestezi altında rijit özofagoskopi uygulandı.

**Bulgular:** Çocuklarda (23 erkek, 9 kadın; ort. yaş 4.6 yıl; dağılım 1-11, mod 1) en yaygın (%56.31) madeni para olmak üzere toplam 32 YC tespit edildi. Yetişkinlerde (21 erkek, 18 kadın; ort. yaş 56.2 yıl; dağılım 16-81) en yaygın kemik ve gıda olmak üzere toplam 39 YC (%43.6) tespit edildi. Yabancı cisimler çocukların %87.5'i ve yetişkinlerin %66.7'sinde üst özofagus sfinkterinde takılmış idi. Yabancı cisimlerin özofagusta bulunma süresi bir saat ile altı ay idi. Tüm işlemler komplikasyon olmadan uygulandı; YC'ler işlemi tekrarlamaya gerek olmadan tamamen çıkartıldı.

**Sonuç:** Çalışma bulgularımız rijit endoskop kullanımının özofagustaki YC'leri çıkarmada güvenilir olduğunu ortaya koymaktadır.

**Anahtar Sözcükler:** Yetişkin; çocuk; özofagoskopi; yabancı cisim takılması.



Foreign body (FB) ingestion can affect anyone, especially the elderly, and mainly involves fish or chicken bones. The most commonly affected groups are the pediatric age groups, edentulous adults, prisoners, psychiatric patients, and alcoholics. The majority of FB ingestions occur in the pediatric population, with a peak incidence between the ages of six months and six years.<sup>[1-4]</sup> Foreign body impaction in the esophagus is quite common when they are sharp, and their removal must be done within 24 hours, otherwise complications can be fatal.<sup>[5,6]</sup> The timing of endoscopy is dictated by the perceived risks of aspiration and/or perforation. Esophagoscopy and FB extraction can be emergent, urgent or non-urgent.<sup>[5]</sup> Rigid esophagoscopy is the most efficient method for visualization and FB extraction. It is performed under general anesthesia, and an esophagoscope -- a cheaper instrument -- is used. Rigid endoscopy is primarily intended for FBs in upper parts of the esophagus.<sup>[7-9]</sup> Flexible endoscopy offers better comfort for the patient, less dysphagia after the procedure, and is performed under local anesthesia,<sup>[10]</sup> but the instrument for flexible esophagoscopy is more expensive.

#### PATIENTS AND METHODS

This study presents our experience in the management of esophageal FB in the Ear-Nose-Throat Clinic, University Clinical Center of Tuzla, Bosnia and Herzegovina. We conducted a retrospective study on 71 patients (44 males, 27 females; mean age 32.99±28.57 years; range 1 to 81 years) who came to our department between January 2003 and December 2013 with a history of a FB in the esophagus. Of these patients, 32 were children (23 males, 9 females; mean age 4.6 years; range 1 to 11, mod 1) and 39 were adults (21 males, 18 females; mean age 56.2 years; range 16 to 81 years). All cases were thoroughly evaluated including history, head

**Table 1.** Foreign bodies in adults' esophagus

Type	n	%
Bone	17	43.6
Meat	16	41.0
Denture	3	7.7
Metal	2	5.1
Apple	1	2.6

and neck examination and imaging immediately before esophagoscopy. All cases underwent rigid esophagoscopy under general anesthesia. All procedures were done without complications and the FBs were completely extracted without repeating the procedure. Data were analyzed using MedCalc version 15.6 (MedCalc Software, Ostend, Belgium).

#### RESULTS

A total of 32 FBs were detected in children with coins being the most common (56.31%) (Table 1). A total of 39 FBs were detected in adults with bones and food being the most common (43.6%) (Table 2). The site of FB impaction in children was in the upper esophageal sphincter, 87.5% in children, and 66.7% in adults (Table 3). The duration of FB in the esophagus was between one hour and six months.

#### DISCUSSION

Any person can be a potential candidate for FB ingestion, and in that case otolaryngologist intervention is necessary. The otolaryngologist must decide when to operate and what method of anesthesia to use. Foreign body impaction in adult and pediatric populations differs in various aspects. The main differences noted in this study were the type of FB, time of impaction and difficulties of clinical status and FB removal.

**Table 2.** Foreign bodies in children's esophagus

Type	n	%	M/F
Coins	18	56.3	14/4
Sharp metal objects	5	15.6	3/2
Meat	3	9.4	3/0
Batteries	2	6.3	2/0
Nuts, cherry plum	2	6.3	0/2
Plastic stopper parts, stone	2	6.3	1/1

**Table 3.** Comparison of site of impaction of foreign bodies in adult and children (Fischer exact test)

Site of FBs	Adult		Children		p
	n	%	n	%	
Upper esophagus	26	66.7	28	87.5	0.052
Mid esophagus	8	20.5	1	3.1	0.035
Lower esophagus	5	12.8	3	9.4	0.721

FBs: Foreign bodies.

The vast majority of swallowed FBs (80-90%) will pass spontaneously through the gastrointestinal tract in 7-10 days without causing any complication, leaving approximately 10-20% that will have to be removed endoscopically and about 1% that will require surgery.<sup>[11]</sup> Sharp FB impaction in the esophagus is a dangerous and difficult situation. Bone removal should be performed within 24 hours, otherwise the complications -- perforation and subsequent mediastinitis, para or retroesophageal abscess and empyema -- can be fatal.<sup>[12,13]</sup>

Our experience shows that the above-mentioned recommendations about the urgency of FB extraction from the esophagus cannot be completely observed, but the extraction plan has to be made for each patient individually. In our study, the findings of FBs predominated among males (61.97%) and children (71.87%), in agreement with the literature.<sup>[14-16]</sup> The average age of the children was 4.6 years. Children aged 1-3 years are particularly at risk because of their increasing independence, lessening of close parental supervision as they become older, and increasing activity and curiosity and because of hand-mouth interactions.<sup>[17]</sup> We noted that the largest number of esophageal coin impactions were in children, which corresponds with published works.<sup>[18]</sup> Coins are relatively easier to remove due to their higher location and less chances of trauma. But we find it useful to point out the different compositions of coins, which can be useful in making a decision on the observation length or the urgency of the procedure. Namely,

there is a higher concentration of zinc in American coins that causes stomach acid secretion, similar to what alkaline batteries do, while Euro coins and old pfennigs contain more iron.<sup>[19,20]</sup> In rare situations, coin ingestion can be associated with metal toxicity.<sup>[21]</sup>

Singh et al.<sup>[22]</sup> point out that in advanced age the commonest FB found are dentures, because of decreased sensation of the oral cavity in denture wearers, gradual loss of sensation and poor motor control of the laryngopharynx. In our study we noticed that dentures as a FB were present in 7.7% of the cases. The most common FBs in adults were related to diet, i.e. bones and meat - in 84.6% of the cases, which corresponds with published works.<sup>[6,23,24]</sup>

There was also a difference noted in the site of impaction of FBs in adult and pediatric populations. In the pediatric population, 3.1% of all the FBs got stuck in the mid esophagus while in adults 20.5% were stuck in mid esophagus and the difference was statistically significant ( $p < 0.05$ ). In our studies the upper esophagus was the commonest site of FB impaction in children and adults. Koirala et al.<sup>[18]</sup> and Kay and Wyllie<sup>[23]</sup> described the upper esophagus was the commonest site of FB impaction in children and the mid esophagus was the commonest site of FB impaction in adults.

One patient, a 16-month-old boy, had chronic esophageal FBs. A metal wire in a loop, 15x5 mm in diameter (Figure 1), had been completely extracted. Neck computed tomography scan was performed before the surgery where a bow-shaped metallic FB was seen behind the beginning of trachea (Figure 2). Laboratory findings included white blood cell (WBC) 11.6, neutrophils 19.4 (L), lymphocytes 68.5% (H), basophils 2 (H), and C-reactive protein (CRP) 1.1.

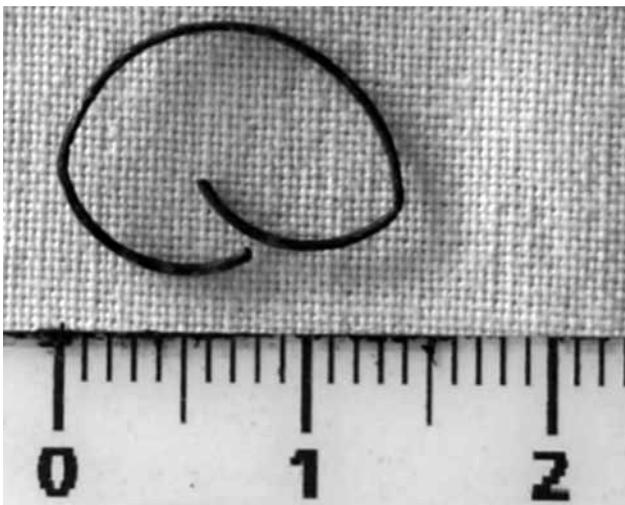


Figure 1. Extracted metal wire.



Figure 2. Neck computed tomography.

The prolonged FB impaction in the esophagus did not cause any serious consequences, all routine laboratory investigations (WBC, red blood cells, CRP) were within normal limits, but lymphocytes and basophils were high, and neutrophils had low levels. Our patient had hoarseness, a rare symptom of esophageal FBs. Up to 75% of pediatric patients with chronic esophageal FBs present primarily with respiratory complaints such as cough, stridor, wheezing, diffuse rhonchi, or elevated respiratory rate.<sup>[25]</sup>

Schramm et al.<sup>[26]</sup> in a literature search on PubMed limited to English-language articles, revealed 23 articles on chronic esophageal FBs in pediatric patients, for a total of 85 patients identified. The authors recommend that chronic esophageal FBs should be included in the differential diagnosis for respiratory distress in children.

### Conclusion

After reading many papers about FB in the esophagus and our experience, we can propose:

1. Extraction plan for esophageal FB has to be made for each patient individually.
2. In children with respiratory distress it is necessary think about chronic esophageal FBs.
3. Beginners in ENT can learn removing the coins in the esophagus before going to bone removal.
4. Removal through the rigid endoscope is the most reliable method and recommended in cases of FB impaction in the esophagus.
5. Complications of esophagoscopy for FB impaction are uncommon but occur even in experienced hands.
6. Repeated FB ingestion may suggest a chaotic home environment, or be manifesting children's psychological abnormalities.
7. More attention is necessary to the prevention of FB impaction, especially among children. Prevention of FB impaction is better than cure.

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