OESOPHAGEAL FOOD BOLUS IMPACTION IN ELDERLY PEOPLE

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Introduction
The diagnosis of food bolus impaction in the esophagus is based on the data obtained from the patient, clinical examination, radiographic diagnosis, and endoscopy. The aim of this study was to examine the influence of possible factors causing oesophageal impaction of food boluses in elderly people. Material and Methods. This retrospective study included six male and eight female patients treated at the Department of Ear, Nose, and Throat Disease in Novi Sad. Results. Post-corrosive oesophageal stricture was diagnosed in 28.57% of patients and non-corrosive stricture was found in 21.43%. Total tooth loss was recorded in 64.29% of patients and 14.29% of patients had partial tooth loss. An impacted food bolus was located at a distance of 15-25 cm or 30-40 cm distance from the upper incisors in 42.86% of the study sample. Discussion and conclusion. The impaction of food boluses in the esophagus is significantly higher in women, usually after 76 years of age. There is a positive correlation between the presence of oesophageal stricture and recurrence of food bolus impaction. Partial and total tooth loss is present in a high percentage but there is no correlation with the food bolus impaction. Impaction of food bolus was equally found in the upper and lower third of the oesophagus and it was usually meat. Radiographic diagnosis should precede each esophagoscopy. Esophagoscopy with rigid oesophagoscope is a reliable method for the extraction of a bolus of food from the oesophagus in elderly patients.

Key words: Deglutition Disorders; Esophagus; Food; Aged; Radiography; Esophagoscopy

Summary
Introduction. The diagnosis of food bolus impaction in the esophagus is based on the data obtained from the patient, clinical examination, radiographic diagnosis, and endoscopy. The aim of this study was to examine the influence of possible factors causing oesophageal impaction of food boluses in elderly people. Material and Methods. This retrospective study included six male and eight female patients treated at the Department of Ear, Nose, and Throat Disease in Novi Sad. Results. Post-corrosive oesophageal stricture was diagnosed in 28.57% of patients and non-corrosive stricture was found in 21.43%. Total tooth loss was recorded in 64.29% of patients and 14.29% of patients had partial tooth loss. An impacted food bolus was located at a distance of 15-25 cm or 30-40 cm distance from the upper incisors in 42.86% of the study sample. Discussion and conclusion. The impaction of food boluses in the esophagus is significantly higher in women, usually after 76 years of age. There is a positive correlation between the presence of oesophageal stricture and recurrence of food bolus impaction. Partial and total tooth loss is present in a high percentage but there is no correlation with the food bolus impaction. Impaction of food bolus was equally found in the upper and lower third of the oesophagus and it was usually meat. Radiographic diagnosis should precede each esophagoscopy. Esophagoscopy with rigid oesophagoscope is a reliable method for the extraction of a bolus of food from the oesophagus in elderly patients.

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Sažetak
Uvod. Dijagnoza bolusa hrane u jednjaku postavlja se na osnovu podataka dobijenih od pacijenta, kliničkim pregledom, radiografskom dijagnostikom i endoskopijom. Cilj rada bio je da se ispitati uticaj mogućih faktora koji kod osoba starijeg životnog doba uzrokuju zaostajanje bolusa hrane u jednjaku. Materijal i metode. Rad je retrospektivna studija koja je obuhvatila 14 pacijenata Klinike za bolesti uva, grla i nosa, Kliničkog centra Vojvodine u Novom Sadu, u periodu od 3 godine. Rezultati. Ispitivani uzorak činilo je 6 muškaraca i 8 žena. Postkorozivnu stenozu imalo je 28,57% pacijenata a nekorozivnu stenozu 21,43%. Spirmanov koeficijent korelacije ukazao je da postoji statistički značajna povezanost između recidiva bolusa hrane zaostalog u jednjaku i pratećih oboljenja jednjaka (ρ = 0,645, p = 0,013). Totalnu anodonciju imalo je 64,29% a parcijalnu 14,29%. Spirmanov koeficijent korelacije ukazuje da ne postoji značajna povezanost između prisustva zuba i stranog tela (ρ = 0,325, p = 0,257). Kod istog broja pacijenta (42,86%), bolus hrane se nalazio na udaljenosti 15−25 cm ili na udaljenosti 30−40 cm od prednjih zuba. Diskusija i zaključak. Zaostajanje bolusa hrane u jednjaku češće se javljalo kod žena a najčešće posle 76. godine života. Postoji pozitivna korelacija između postojanja steneze jednjaka i pojave recidiva bolusa hrane. Parcijalna i totalna anodoncija zastupljeni su u visokom procentu ali nema korelacije između ove dve pojave. Pojednako su bolusi hrane zaostajali u gornjoj i donjoj trećini jednjaka a najčešće je to bilo meso. Radiografska dijagnostika treba da prethodi svakoj esofagoskopiji. Esofagoskopija rigidnim esofagokopom je pouzdana metoda za ekstrakciju bolusa hrane iz jednjaka kod osoba starijeg životnog doba.

Ključne reči: Poremećaj gutanja; Esofagus; Hrana; Stari ljudi; Radiografija; Esofagoskopija

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changes in the swallowing mechanism are called presbyphagia. These changes progress with the decreasing ability of the body to adjust to a physiological stress, and with the increasing co-morbidity in elderly. In comparison to younger people, healthy elderly people have reduced isometric (static) pressure of tongue. The swallowing is slow, the laryngeal and pharyngeal movements are slow too, including the laryngeal aditus closing, that is, closing of the air pathway.

Dry oral mucosa does not involve only the mouth, it often spreads to the pharynx and the oesophagus, which leads to food obstruction. Food remains in the mouth can increase the risk of bacteria spreading, thus, oral hygiene is very important. If food stays in the oesophagus for the same reason, antiperistaltic movements can be activated and food will be returned to the pharynx. That process is called the intraoesophageal reflux. Taste, temperature, and tactile sensors change with aging, and sarcopenia (the degenerative loss of skeletal muscle mass, a reduction in number and size of muscle fibres, transformation or selective loss of some muscle fibres), deteriorate the chewing and swallowing functions significantly [2].

However, recent studies indicate that swallowing is not jeopardized by aging itself; although medical problems and some other conditions, influenced by the swallowing, have a tendency to appear later in life [1].

The most frequent causes of the foreign bodies obstruction are: neurological disorders and stroke (Parkinson’s disease, multiple sclerosis, traumatic brain injury, amyotrophic lateral sclerosis, motor neuron disease) [1,3]; structural lesion of the esophagus (neoplasm, diverticulum, post corrosive and noncorrosive stricture) [3]; mental disorders (mental retardation, alcoholism), connective tissue diseases (polymyositis, muscular dystrophy) [2,3]; iatrogenic causes (surgery) [4,5]. Among the causes are drugs, such as anticholinergics, antidepressants, antihistamines [1,2] which can have adverse effect on saliva production in the mouth or those which can lead to inflammation of the oesophageal mucous membrane, such as tetracycline, iron preparations, non-steroidal anti-inflammatory drug, potassium [2,4].

The most common symptoms are the following: dysphagia, odynophagia, hypersalivation, dyspnea and cyanosis, cough, drooling and the fixed position of the patient’s head (usually bent forward) in order to alleviate the discomfort caused by the foreign body. The patients are scared, excited, and upset. They may feel pain in the larynx (if a foreign body is positioned in the upper parts of an oesophagus), behind the sternum, spreading towards the scapula or the epigastrium (if it is positioned in the lower parts) [6]. When a foreign body is in the upper oesophageal sphincter region, the patient can localize it without a problem. However, if it is localized in the upper parts of the oesophagus, it can result in predominant symptoms of the respiratory system obstruction, such as dyspnea, wheezing, and cyanosis [7] or pains caused by angina pectoris [8].

If a foreign body is in the lower parts of the oesophagus, there can be various symptoms, among which are odynophagia, choking and retrosternal pain. Odynophagia is the result of the Oesophageal distension by the food bolus, but it can also be a symptom for the Oesophageal injury such as laceration, abrasion, or perforation. Therefore, each odynophagia must be taken seriously [9].

Food bolus in the oesophagus is diagnosed according to data taken from the patient, by clinical examination, laryngeal movement test, drinking water test, radiographic testing and endoscopy. If spontaneous propulsion of food bolus does not occur, extraction from the oesophagus can be done by the flexible or, preferably, rigid endoscope. Medicamentous treatment is also one of the therapeutic options [10]. Oesophageal food boluses as well as their extraction can result in complications [11-13].

The aim of the study was to examine the possible factors causing oesophageal food bolus impaction in elderly people.

Material and Methods

This retrospective study included 14 patients treated at the Department of Ear, Nose, and Throat Disease, of the Clinical Center of Vojvodina in Novi Sad during the three-year period. All the patients were diagnosed with food bolus impaction in the oesophagus according to the anamnesis, clinical examination, radiographic diagnosis, and endoscopy. Afterwards, all of them underwent extraction of food boluses. Special attention was paid to the type and place of impacted food, the way of food bolus extraction, as well as to the presence or the absence of teeth and implants, previous Oesophagus diseases, accompanying diseases, the size of endoscopes, and recurrent boluses, if any. The spreadsheet software, Microsoft Excel 2007 and statistical package Statistica 5.5, was used for the statistical data processing.

Results

The study sample consisted of 14 subjects, six men (42.86%) and eight women (57.14%). They were all between 61 and 88 years old, their average age being 76.28. Eight patients, i.e. 57.14% of the total number of subjects, were older than the average age. Of seven patients who had had esophageal food impaction at stricture sites (Figure 1), and thus were aware of the contemporary esophageal disease, four patients (28.57%) had post corrosive oesophageal stricture and three patients (21.43%) had non-corrosive stricture. Other patients had no knowledge of their previous oesophageal disease. No associated diseases were present in 13 patients (92.86%), whereas one patient (7.14%) had Parkinson’s disease.
Spearman’s coefficient correlation indicated that there was a statistically significant connection between the recurrent food bolus in the oesophagus and associated esophageal diseases ($\rho = 0.645$, $p = 0.013$). Three patients (21.43%) had their own teeth, whereas two patients (14.29%) had a partial tooth loss, and nine patients (64.29%) had total tooth loss. However, Spearman’s coefficient correlation indicated that there was no significant correlation between the presence of teeth and a foreign body ($\rho = 0.325$, $p = 0.257$).

Eleven patients (78.58% of cases) had a foreign body removed with a gripper; whereas, in three patients, that is 21.34% of cases, there was a spontaneous bolus propulsion towards the oesophagus during esophagoscopy.

Six patients (42.86%) had food bolus at 15-25 cm distance from the front teeth (Figure 2). Two patients (14.29%) had food bolus at 25-30 cm from the front teeth, and six patients (42.86%) had it at 30-40 cm distance (Figure 3).

The most common food bolus in this research, found in ten patients (71.43%), was meat. A bone was found in two patients (14.29). Pork liver and meat with cartilage were found in one patient (7.14%), each.

The most frequently used rigid endoscope for extraction of an impacted food bolus was the 10x14x50 tube, which was used in six patients (42.86%). The 12x16x30 and 21x16x50 endoscope was used in three patients (21.43%), each. The
Discussion

According to Longstreth et al [14], the frequency of the foreign bodies impacted in the oesophagus increases with age, especially after the seventh decade. So in this study, more than a half of patients were older than 76. This study showed that a foreign body impaction was more frequent in women [15], whereas it is more frequent in men according to most other studies. Brooks [7] reported that the male-female ratio was 55%–45%, Longstreth et al. [13] said it was 1.7–1, and according to Williams et al. [16] it was 3:1. Kirchner et al. [17] state that the causes of bolus impaction in the oesophagus are eosinophilic oesophagitis and reflux oesophagitis with and without peptic stenosis. Although the oesophageal stenosis is the cause of the recurrence of food bolus impaction of the oesophagus, Reddy et al [18] reported the recurrence bolus rate to be 9%, stating the presence of hiatus hernia as the only reason and giving no detailed explanation of its influence on the recurrent bolus. Prasad et al. [19] also claim the hiatus hernia is the cause of the recurrence of food bolus impaction of the oesophagus.

It is interesting to say that almost a third of patients in this study had the post corrosive oesophageal stricture. Regarding the fact that the patients are elderly people, the reason for the post corrosive oesophageal stricture has been explained in detail. In the post-war Republic of Yugoslavia, laundry soap was made at home, because of poverty and undeveloped chemical industry. To that purpose, sodium hydroxide, which is essential for making soap, could be bought and sodium hydroxide poisoning was rather frequent with the resulting oesophageal damage. This is exactly what happened to four patients from the study sample and how they developed post corrosive oesophageal changes [20].

The fact that nine patients (64.29%) did not have any teeth indicated that the total tooth loss may have had some influence on food bolus impaction in the oesophagus. However, Spearman's coefficient correlation did not prove that there was a significant correlation between the teeth presence and a foreign body. Nevertheless, this data and the fact that saliva secretion is reduced in elderly people due to fewer acinar cells as well as weakened tongue muscles [4] account for higher frequency of foreign body impaction in elderly people. Ginsberg [8] mentions that the bad teeth condition and/or improper made and/or fitted dentures are contributing factors to food bolus impaction.

Every patient from this study had their history taken and underwent clinical examination, followed by native or contrast radiographic examination. Barium and Gastrografin were used as contrast media. Williams et al [16] believe that this diagnostic procedure must be applied in all patients suspected to have foreign body impaction.

Native or contrast radiographic examination is done to show the place where food is impacted on its way through the oesophagus, to plan further intervention and to decide whether to perform oesophagoscopy, and if so, what size tube to use to extract the foreign body.

Oesophagoscopy has revealed that the most common places of food bolus obstruction are between 15 cm and 25 cm, and between 30 cm and 40 cm from the front teeth, usually, imaginary front teeth, the frequency being 42.86%, whereas the distance from 25 cm to 30 cm from the front teeth is far less frequent. Brooks [7] has also showed that the place of the most frequent food bolus obstruction is in the upper third part of the oesophagus. In addition, his finding that the middle third part of the oesophagus is the least frequent place of foreign body impaction coincides with the findings of this study. Athanassiadis et al [3] have reported the same results. They claim that the most frequent and the least frequent place of foreign body impaction is the cervical part of oesophagus (57%) and the abdominal part of the oesophagus (17%), respectively, which is in contrast to the results obtained in this study. The reason why more patients from this study had food obstruction in the lower part of the oesophagus, is that one out of the seven patients had stenosis in the upper part (14.28%) and the other six (85.72%) in the lower third of the oesophagus.

During oesophagoscopy, eleven patients (78.57%) had their foreign body extracted, whereas, spontaneous propulsion happened in three patients only (21.43%). Williams et al. [16] have reported the opposite results, stating that spontaneous propulsion happened in 60.2% of patients. This finding corroborates the opinion that oesophagoscopy should not be rushed in the patients who did not have any previous oesophageal obstruction since spontaneous food bolus propulsion can happen, as claimed by Ko et al [9]. However, oesophagoscopy should be performed if a patient does not have food remains which can cause complications (bone), or there is no bolus impaction. In that case spontaneous propulsion would not happen [21,22].

Meat is the most frequently found bolus in patients (71.43%), followed by a bone, pork liver, and meat with cartilage. The same finding has been reported by Brooks [7] and the authors of this study. According to Ginsberg [8], meat (beef and chicken) is also the most common bolus. Williams et al [16] have reported somewhat different results. They claim that a bone is far most common food bolus (81.4%). However, what should be taken into account here is the fact that the average age of their patients was 52 years, which is much younger age in comparison with the age of patients from this study.

Likewise, Adhikari et al [23] and Pudar [15] claim in their studies that meat is the most common foreign body, and they have reported its frequency to be 76.1% and 42.3%, respectively.

No complications whatsoever developed in the patients with food bolus or in those who had the bolus extracted by rigid oesophoscope.
Conclusion

Oesophageal food bolus impaction is significantly higher in women, most often in those over 76 years of age. There is a positive correlation between the presence of oesophageal stenosis and recurrence of food bolus impaction. Partial and total tooth loss is present in a high percentage but there is no correlation with food bolus impaction. The impaction of food bolus is equally found in the upper and lower third of the oesophagus and it is usually meat. Radiographic diagnosis should precede each oesophagoscopy. Oesophagoscopy with rigid oesophagoscope is a reliable method for the extraction of food bolus from the oesophagus in elderly people.

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