

CLINICAL CASE

MANAGEMENT OF A CASE OF PNEUMOMEDIASTINUM CAUSED BY PERFORATION OF THE ESOPHAGUS THROUGH DENTURE

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Abstract

For the management of swallowed foreign bodies, literature does not cite a certain therapeutic behavior as a gold standard. Swallowed foreign bodies, blocked in the esophagus, represent a medical problem most commonly encountered in pediatric patients, but it is also common in adults, in the elderly and psychiatric patients. Esophageal perforation with secondary pneumomediastinum is an extremely rare complication with high mortality (50-70%). We present the case of a 65-year-old patient, known with schizophrenia, who is hospitalized for involuntary intake of a foreign body (denture). Clinically, the patient is conscious, hemodynamically stable, has a subcutaneous emphysema involving cervico-thoracic region and upper limbs. X-rays and CT's reveal a foreign body located at the T7-T8 level with suspicion of mediastinal complication. Postero-lateral thoracotomy is performed in the sixth right intercostal space and acute mediastinal distention is observed through dental retention with esophageal microperforation under the bifurcation of the trachea. Large incision of mediastinal pleura is done, with purulent serohematic fluid discharge.

The foreign body is extracted endoscopically under the manual control of the esophagus. Gastrostomy and Beclere thoracic drainage are set. On the sixth post-op day, a reintervention is performed for persistent chylothorax, with the suture of the thoracic duct. Evolution is slowly favorable; the patient is discharged after 30 days. Sustained and aggressive therapeutic and surgical management can lead to a favorable progression even in a high mortality case such a pneumomediastinum caused by perforation of the esophagus through a foreign body.

Keywords: *pneumomediastin, foreign body, thoracotomy, endoscopy, chylothorax*

Introduction

Ingestion of foreign bodies is most commonly seen in children between 6 months and 6 years of age. In adults, this happens most often in accidental ingestion along with the food, but predisposing factors were identified in persons with: digestive tract problems (strictures, neoplasms, esophageal rings,

achalasia, eosinophilic esophagitis), advanced age, mental retardation, psychiatric disorders. The most frequently seen foreign bodies are fish bones (9-45%), chicken bones (8-40%) and dentures (4-18%) [1].

Even though most of the ingestions of foreign bodies have usually a benign natural course, in USA alone, 1500 deaths are reported every year, thus the morbidity is increased [1].

Currently there is no gold standard regarding the therapeutic behavior for the management of swallowed foreign bodies.

The patient's symptoms, the physical findings, the type of ingested material, the duration of the impacted object, set the following clinical attitude. In most cases, 80% of the ingested objects pass uneventfully through the gastrointestinal tract; in 20% of cases, endoscopy is required and surgery in less than 1% [1,2].

Case presentation

A 65-years-old patient, known with schizophrenia, is hospitalized in an emergency hospital for involuntary intake of her own denture. Before admission, she had been trying for 5 hours to extract it, but unsuccessfully. The patient was conscious (GCS=, M=5, V=2, O=2), hemodynamically stable (HR=113, BP=120/61 mmHg), afebrile 36,5°C and presented subcutaneous emphysema involving cervico-thoracic region and upper limbs. CTs revealed foreign body (T7-T8) with mediastinal complication. The extraction of the foreign body failed, due to inadequate medical equipment. It was then decided the transfer to „Sf. Maria” Clinical Hospital Bucharest.

The pathological paraclinical findings revealed anemic syndrome, inflammatory syndrome and elevated serum amylase.

The differential diagnosis was made with other common ingested foreign bodies. In elderly patients, denture ingestion is due to loss of laryngopharyngeal and oral cavity sensitivity caused by long-term using of them[3].

The medical treatment includes a complex scheme of antibiotics which is followed for 27 days.

It is mandatory to notice that the surgical timing of the procedure exceeded over 24 hours from the ingestion.

Postero-lateral thoracotomy is performed in the sixth right intercostal space and acute mediastinitis secondary to denture retention is confirmed, along with the esophageal microperforation beneath the tracheal branching. Mediastinal step followed by the drainage of large quantity of purulent and serohematic liquid. The foreign body was

extracted endoscopically under manual control of the esophagus (Figures 1 and 2).

In the first 24 hours, per primam suture would be enough, but over this time limit, the risk of fistulization and damaging of the neighboring tissues is at a higher risk. According to Salo *et al.*, significantly different mortality rates exist between primary repair (67%) and esophagectomy (13%) groups in patients with delayed esophageal perforation and presence of septic conditions [4].

The esophageal microperforation didn't allow the extraction of the foreign body through the thoracotomy wound therefore esophagotomy was avoided. The esophagus was closed with per primam suture. Beclere drainage was set and a median mini-laparotomy was performed by Stamm technique, for a nutrition gastrostomy.



Figure 1 - Endoscopic extraction of the denture

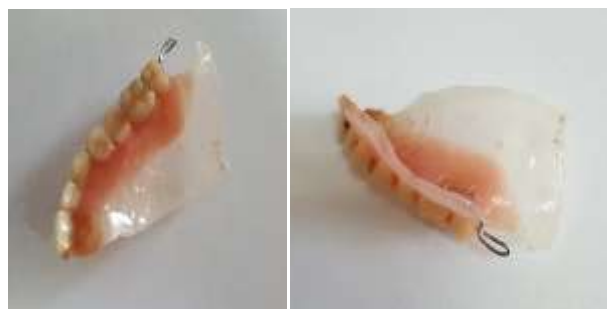


Figure 2 - The extracted denture

The immediate post-op X-rays showed the large extension of the emphysema (Figure 3), which had a favorable evolution, objectified with the second-day radiography (Figure 4).

The post-op evolution is marked by the progressively high drainage of over 3700mL of purulent liquid (Figure 5).



Figure 3 - Radiography: Immediate post-op image with subcutaneous cervico-thoracic emphysema



Figure 4 - Radiography: favorable evolution with decreasing of the emphysema (2 days post-op)

The patient is diagnosed with right chylothorax, a common complication determined by the perforating foreign body. In the sixth day after the first surgery, the team planned an operation for suturing the thoracic duct. The position of the lesion was previously determined using the so-called Cream Test.

The evolution after the second intervention was slow with detectable bacteremia with *Klebsiella Pneumoniae*, along with pathological cultures isolated from the thoracic wound and the abundant sputum (*Pseudomonas aeruginosa* and *Klebsiella Pneumoniae*).

The digestive tract was restored after performing of the methyl blue test. The gastrostoma was suppressed and the oral nutrition was progressively reintroduced (second day post-op). It can be noticed how the patient's evolution was extended to 1 month from the diagnosis to fully surgical recovery and discharging.



Figure 5 – Free flowing and build-up pleural effusion in the right pleural cavity with upper limit not exceeding the right eighth costal arches; left costo-diaphragmatic recess obliteration.

Discussions

Serious life-threatening complications of foreign body ingestion do occur, but in less than 1% of the cases. Of these complications, esophageal perforation carries a mortality rate that remains as high as 20% and can result in serious complications such as mediastinitis and retropharyngeal or parapharyngeal abscess. Esophageal perforation is a very rare occurrence since accidental swallowing of foreign bodies is uncommon in adults. Thus, perforation due to swallowing of a foreign body and subsequent development of mediastinitis is rarely encountered by physicians. Also, statistics show higher rates of complications in adults compared to children (37,1% vs. 8,8%) [2].

Taking into consideration the fact that the presence of a chylothorax could not be established during the first operation due to the high amount of drained purulent and serohematic liquid, it is questionable whether the thoracic duct lesion was caused by the ingested denture or iatrogenically.

Conclusions

Even though there is no current gold standard procedure, the outcome for these patients is favorable due to the proper management within the first 24 hours [5]. The early management positively influences the

patients evolution in terms of survival rates as well as long-term complications.

The mortality for targeted patients with late-complications and sepsis is influenced by the decision of whether performing primary suture (67%) or esophagectomy (13%) [5]. In our patient's case the primary suture was the best option due to the microperforation of the esophagus. The decision was made entirely by the operating team at the site of the operation.

References

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