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ESOPHAGO-PULMONARY ARTERIOUS FISTULA BY INGESTION OF A FOREIGN BODY: A CASE REPORT

Abstract: This is a case report of a 92-year-old woman, suffering from dysphagia and retrosternal pain, caused by an oesophageal foreign body that was found during an endoscopic examination. Few days after unsuccessful attempts of removing the woman suddenly died. We present the anatomical and histopathological study of the anatomical part, preceded by Computed Tomography images acquisition. All data substantiate a fistula development between oesophagus and pulmonary artery caused by a foreign body (during the post-mortem examination we found out it was a chicken bone).

The presentation of this extraordinary event wants to point out that high definition radiodiagnostic techniques have key role as an essential preparatory aid to face peculiar problems of forensic pathology and can be extremely useful to lead a much more targeted macroscopic examination and histological verification.

Introduction

Oesophageal perforation by foreign body, for its diagnostical and terapeutical implications and for the correlated severe prognosis is often a situation of forensic medicine interest.

As well knew, the majority of oesophageal perforations occurs because of impacted foreign bodies at site of anatomical narrowing (cervical-thoracic or diaphragmatic).

Most severe complications are sepsis or lethal hemorrhage caused by perforation of most important mediastinal vessels after fustulas formation.

In medical literature a lot of cases of dead by haemorrhage caused by oesophageal-arterious fistula, between oesophagus and aorta or one of its major branches are described.

A singular case of oesophageal-arterious fistula produced by a foreign body, between pulmonary-artery and oesophagus is presented. In this particular case imaging diagnostic techniques were used in order to acquire suggestive elements for corpse section procedure and for physiopathological proceeding reconstruction.

Case Report

A 92-year-old woman attended to the Emergency Department with a two months history of dysphagia, post-prandial regurgitation and retrosternal chest pain.

Oesophagoscopy revealed a foreign body embedded in the oesophageal wall, 35 cm from the incisor. An unsuccessful attempt of retrieval of the foreign body was made. A thoracic Computed Tomography (CT) revealed: an oesophageal wall inspissation in correspondence of tracheal bifurcation; a thin foreign body of bone density; no mediastinal troubles. A new unsuccessful attempt of retrivial was performed, followed by a moderate bleeding which was controlled by Sengstanken-Blakemore tube insertion. A new urgent Computed Tomography showed thin air-bubbles into mediastinal tissues and in correspondence of Aortic bulb and a para-oesophageal haematoma.

In absence of unequivocal clinical and radiological signs of iatrogenic perforation, and because of her steady clinical conditions, the woman was recovered for further management. 5 days after the woman suddenly died.

During autopsy, on the basis of clinical and radiological findings, mediastinal structures were *en bloc* removed and showed: at the lower third of oesophageal lumen, at 11 cm from aditus ad laringem, a foreign body (Fig. 1). This consisted in a sickle-shaped chicken bone with pointed tips (Fig.2), one of which embedded into the anterior oesophageal wall, where there was a 1.3 cm length ulcera-like lesion, with rounded edges (fig. 3). The whole pulmonary artery wall was interested by a 1cm length irregularity (Fig.4).

During post-mortem examination were also found: left ventricle concentric hypertrophy and wall inspissation and calcification of coronary arteries.

Mediastinal structures were fixed with formalin buffered solution and after few days a Computed Tomography was carried out. Images acquired indicated a whole thickness wall oesophageal perforation (Fig. 5) and some empty spaces into soft tissues of mediastinum (Fig. 6).

A following targeted anatomo-pathological examination of the specimen was performed. This permitted to demonstrate, and confirm what CT images revealed: a fistula passage (Fig. 7) which connected the oesophageal lesion with the pulmonary artery lumen, surrounded by an organized haematoma (Fig.8).

Subsequent histological findings were:

Oesophagus: irregularity of all the 4 layers of the oesophageal wall, preceded by Red Blood Cells and granulocyte cells infiltration that produced squamous epithelium loss and swelling of mucosal layer. The edge was infiltrated by a close exudates of granulocytes, that penetrates into the wall as far as muscolaris propria, where also lymphocities and hystiocities were presented. Deeply the passage result in an haematoma.

Haematoma: Coagulated blood of different chronology: the recent one consisted in platelets, fibrin and granulocityes; and the oldest one consisted in fibrin and hyaline.

Pulmonary artery: the tunica adventitia was reached by flogosis elements, around haemorrhagic focuses. The vessel wall presented a reduction of elastic elements. Deeply the vessel wall appeared deteriorated and in continuity with the haematoma.

Heart: several areas of scar tissue; coronary arteries with diffuse stenotic atherosclerosis.

Lung: chronic emphysema, edema areas, congestion.

The cause of death was ascribed to a terminal cardio-respiratory failure.

Discussion

Unlike aorto-oesophageal fistula, in this case the cause of death wasn't due to a massive haemorrhage and then cardiovascular collapse. With reference cardio-respiratory pathological findings, it appeared very difficult to find a causal relationship between mediastinal haematoma and the exitus. Mediastinal haematoma formation and grew, on the basis of imaging, anatomical and histological data must be referred to the interruption of pulmonary-artery wall, progressively reached by the fistula passage. The fistula evolution was, evidently, conditioned by complex mediastinal dynamics, such as respiration, circulation and oesophageal transit.

The case suggest some consideration.

Surely imaging techniques, and in particular CT, should be considered as a methodics of large aid that can give accurate indication for post-mortem dissection. In this case, in fact, multiplanar images acquisition, allowed to evidence and put in relation the mediastinal empty spaces with the oesophageal wall interruption and the chicken bone, foreseeing anatomo-pathological data and suggesting in a correct and precise post-mortem examination.

Otherwise, on fixed tissues CT has some technique limits, correlated to pathological or traumatic modification underestimation. This limits could be overcome by usual forensic pathology methods support, such as anatomical and histological research

Application and utility of imaging techniques seem to be unquestionable, above all in case of lesions placed in particular anatomical regions, difficult to approach and to evaluate, such as mediastinum, and especially on isolated organs or on anatomical parts.

We also think that the forensic pathologist should frequently use imaging techniques as a propedeutical aid, for an accurate approach to the anatomical parts dissection and so for their macroscopical and microscopical assessment.

The use of these many different methods and techniques will make easier the possibility of a correct interpretation of any singular case.

We hope in a continuous increase of high resolution imaging application in forensic pathology, both on corpses and their parts. This will request an higher cooperation between forensic pathologist and radiologist.

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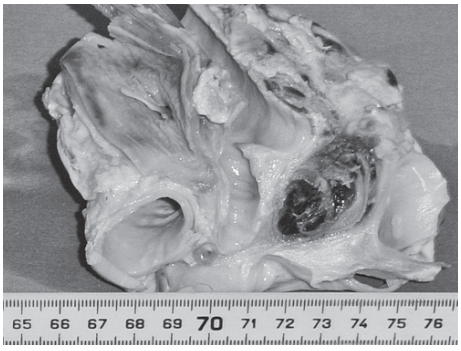

Figure 1 – Mediastinal structures removed *en bloc*. An oesophageal foreign body and a mediastinal haematoma are visible.

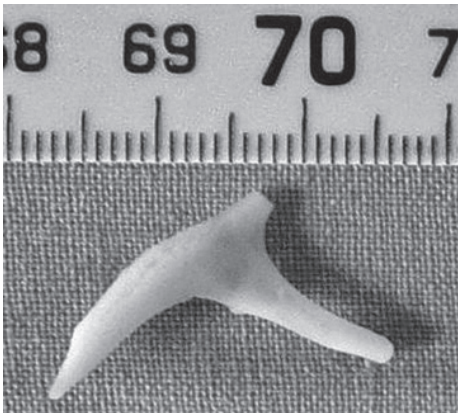

Figure 2 – Foreign body: a sickle-shaped chicken bone with pointed tips.

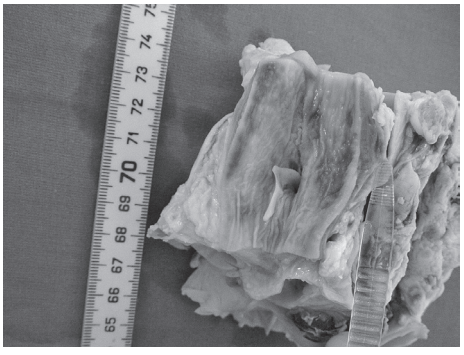

Figure 3 – Foreign body embedded into the anterior oesophageal wall. An ulcera-like lesion of mucosal layer is visible.

Figure 4 – Pulmonary artery injury: a 1 cm length irregularity of all the pulmonary artery wall layers.

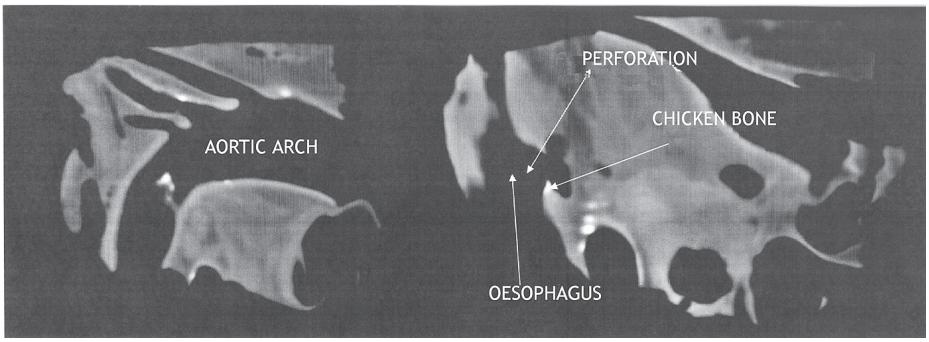

Figure 5 – Computed Tomography findings. Esophageal perforation and a foreign body of bone density are recognizable.

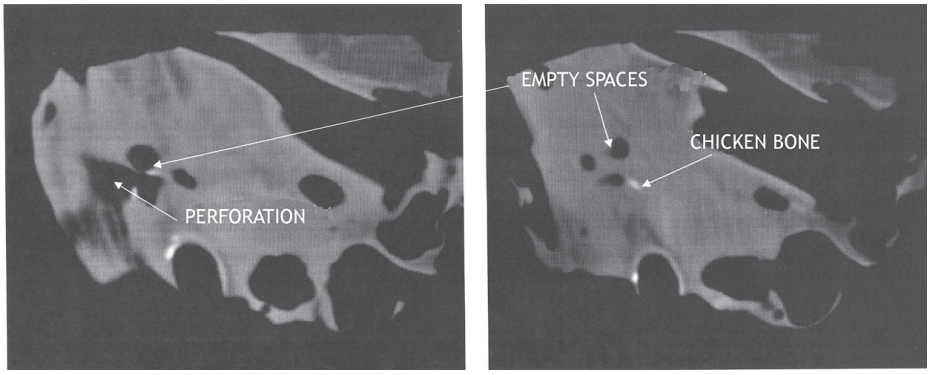

Figure 6 – Computed Tomography findings. Empty spaces into mediastinal soft tissues in relation with chicken bone and esophageal perforation.

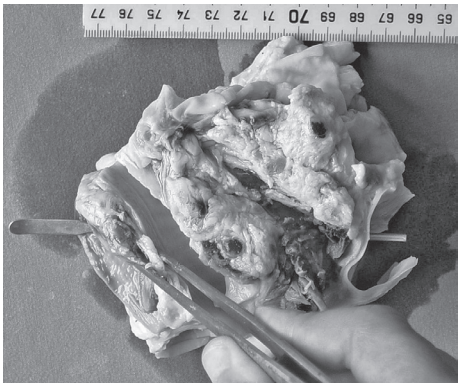

Figure 7 – Fistula passage. Oesophageal lumen and pulunary artery lumen are connected.

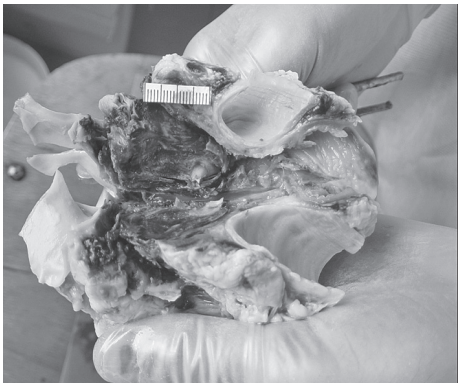

Figure 8 – Oesophageal-pulmunary artery fistula surrounded by a mediastinal haematoma.