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Case Report

Ingested fish bone causing cervical esophageal perforation with evaluation of critical anatomy by CT: A case report[☆]

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Introduction

Obstruction of the upper aerodigestive tract foreign bodies are frequently seen situations whose removal can easily be achieved by identification and removal using esophagoscopy [1,2]. In contrast, delayed recognition of foreign body perforation of hypopharynx and cervical esophagus are associated with life-threatening comorbidity and mortality such as pneumomediastinum, mediastinitis, carotid artery pseudoaneurysm, pleural empyema, septic shock, and death [3]. In this clinical context, mortality caused by foreign body perforation of hypopharynx or cervical esophagus must be prevented by a prompt recognition and its mortal comorbidities. In this case report, we would raise an importance of a prompt and accu-

rate identification of cervical esophagus perforation by foreign body using 3-dimensional multidetector-computed tomography (3D-MDCT) which has also provide critical anatomical information regarding similar occurrences in adjacent organs including trachea, aortic branches, and mediastinum.

Case report

A 77 years old female visited outpatient-clinic with complaint of pharynx pain. This complaint started at eating fish at the lunch and continued for three hours. Her past history was hy-

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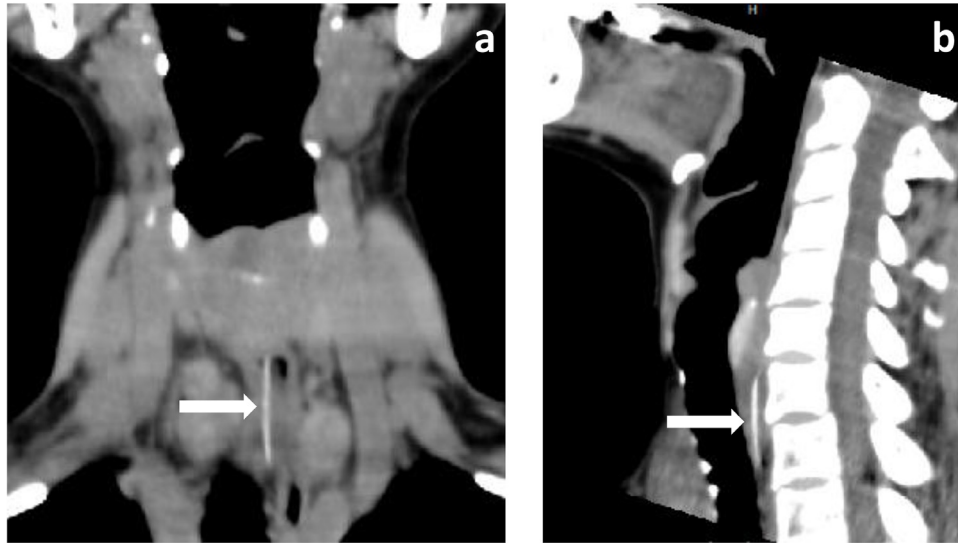


Fig. 1 – The plain abdominal computed tomography (CT) images, coronal and sagittal planes. This image showed a linear calcification (arrows in this figures) and surrounding esophageal wall thickening consisted with co-existing inflammation. (a) Coronal plane, (b) sagittal plane.

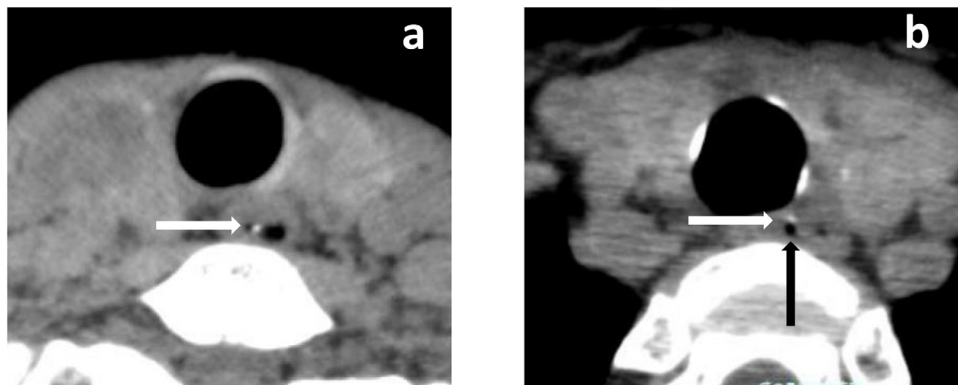


Fig. 2 – The 3-dimensional multidetector-computed tomography (MDCT) images, transverse planes. (a) Thyroid level shows oral side edge of fish bone existing in the esophagus cavity, (b) T1 vertebral level shows distal end of fish bone penetrating out of esophagus (white arrow) and free air in the upper mediastinum (pneumomediastinum; black arrow).

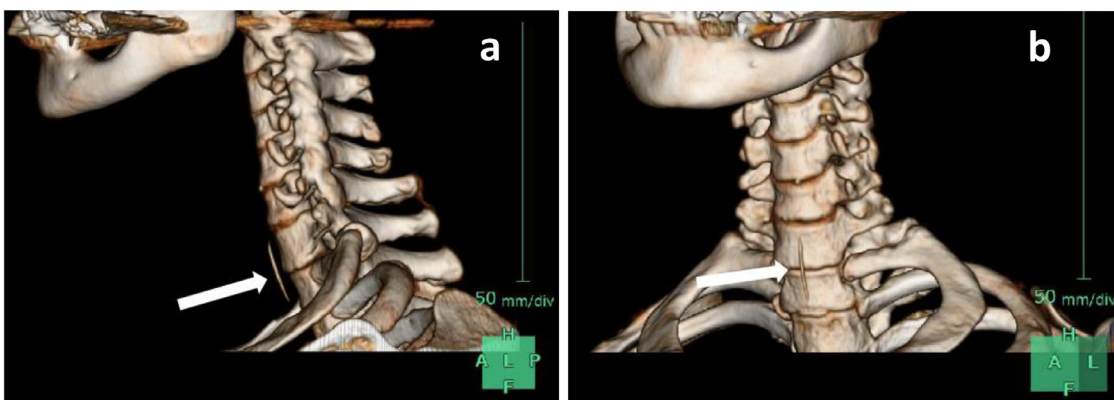


Fig. 3 – The 3D-MDCT reconstruction images of fish bone. (a) Sagittal plane shows linear calcification, (b) left oblique plane shows a linear calcification left-sided in front of vertebrae between C7 and T1 levels.

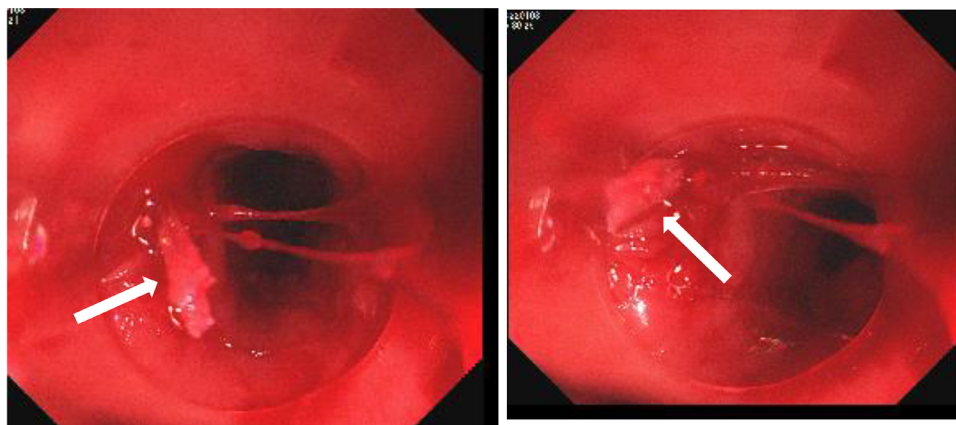


Fig. 4 – An esophagoscope viewing of the fish bone. Esophagoscopy revealed a fish bone penetrating into the cervical esophageal wall. After taking this view, this fish bone was removed using snare forceps under endoscopic procedure.

perthyroidism and hypertension and both had been treated with medications. On visiting to our hospital, her temperature was 36.5°C, blood pressure 99/36 mm Hg, and heart rate was 76 beats per minutes. On physical examination, no abnormal signs were observed in oral cavity or nowhere else. The laboratory workup demonstrated a white blood cell of 5520 count / mm³ (reference value (ref.): 3300-8600), neutrophile of 76 % (ref. 42.0-74.0), lymphocyte of 18% (ref.18.0-50.0), TLC counts 994 count/ mm³ (ref. < 1500), serum albumin (Alb) of 3.5 g/dL (ref. 4.1-5.1), and C-reactive protein of 0.08 (mg/dL) (ref. 0.00-0.14). Then, her prognostic nutritional index (PNI) was 39.9 according to the calculating of {10 X [Alb] + 0.005 X [TLC]}. When calculated PNI value is < cutoff point of 51.3, it has been reported to have high possibility of surgical complications [4]. From this, her lower PNI value indicated high possibility of adverse events. To identify the causes of pharyngeal pain, the plain cervical computed tomography (CT) was done and that showed a linear calcification image penetrating esophageal wall thickening which was consistent with co-existing inflammation (Fig. 1). To visualize details of calcification, 3D-MDCT imaging was added and it visualized a sharp-pointed longitudinal linear foreign body perforated into the cervical esophageal wall. It seized 26.7 mm and 1.5 mm in in the vertical length the transversal width, respectively, and located 3.1 mm anterior to 1st and 2nd thoracic vertebra (Fig. 1). Its head located out of esophagus and seemed reaching to upper mediastinum diagnosed pneumomediastinum (Fig. 2). These details of 3D-MDCT images resemble to fin of fish bone that she had reported to have ingested at lunch (Etelis, called Akamatsu fish in Japanese). According to the diagnosis of cervical esophageal perforation by fish bone, an urgent esophagoscopy was required. Consecutive esophagoscopy revealed a pointed fish bone perforated at 11-o'clock direction of the esophageal wall and successfully removed using snare forceps with careful attention to prevent endoscopic complications such as esophageal rupture, para-esophageal abscess, mediastinitis, pleuritis, or aortic pseudoaneurysm. During 3 days' follow-up period, cervical and mediastinal CT study was added to checkup post-endoscopic complications and no comorbidities was confirmed. She discharged uneventfully three days later.

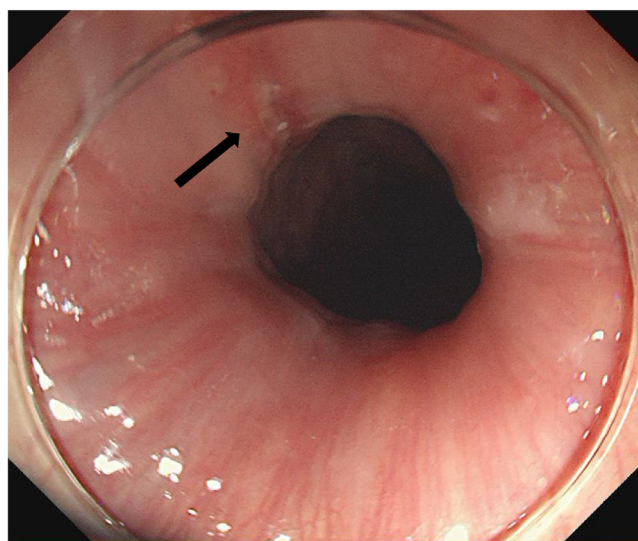


Fig. 5 – An esophagoscope viewing 3 days after fish bone removal. An ulcer scarring change of the cervical esophageal mucosa was observed and no rupture or abscess formation exist after the fish bone removal.

Discussion

A foreign body causing perforation or rupture of hypopharynx or cervical esophagus reported in the literature includes sharp-edged plastic for medication (Press Through Package) and pointed fish bone [5]. Among 79 cases with esophageal rupture collected in a single institute, 39 sized of rupture > 10 mm underwent primary surgical repair and 4 patients died. In addition, mortality rate reached to 20% when causes were iatrogenic such as endoscopic procedures [5–7]. The mortality of esophageal perforation or rupture ranges between 10% and 20% unless an optimal treatment is undertaken within 48 hours since the diagnosis. Considering high mortality for esophageal perforation and rupture, a prompt diagnosis using

3D-MDCT might be essential even to prevent life-threatening endoscopic complications aforementioned.

Conclusion

A 77 years female with fishbone-induced esophageal perforation was treated endoscopic procedure. For diagnostic modality, pre-endoscopic 3D-MDCT seems sufficient to visualize details of foreign bodies in the esophagus and information around cervical esophagus such as airway, aortic branches, and mediastinum to consider high mortality with esophageal perforation or rupture treated later than 48 hours after complaints occur.

Patient consent

Informed consent was obtained from the patient for the publication of this case report after her death. This case report was approved by the hospital ethic committee and the approval number is 22-05.

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