

A CASE OF FOREIGN BODY PERFORATION OF THE OESOPHAGUS

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Introduction

STATISTICS show that coins and bones are the commonest foreign bodies to lodge in the oesophagus. According to a survey at the Leeds General Infirmary, coins (92 per cent) most frequently present in children but the majority found in adults were bones. (Seed, 1952.)

Sharp objects such as fish bones are most liable to stick at the proximal narrow part of the oesophagus, *i.e.* the supra-oesophageal sphincter of Sir Everard Home.

Because of the nature of the first anatomical coronal curve of the oesophagus, *i.e.* slight amplitude to the left in the cervical region, it is on the latter side that the perioesophageal abscess resulting from perforation of the gullet, is most likely to extend. The pre-tracheal fascia having split to form a capsule for the thyroid gland merges laterally with the carotid sheath (Furstenburg 1929). This latter fascia therefore, prevents further extension of the abscess forwards and outwards between the gland and the great vessels.

The following case is reported particularly, because of the localising features just described, which presented when a cervical abscess was drained. The case also revealed some interesting radiological features.

Case Report

The six year old daughter of a Malayan RAMC Private was referred to the Ear, Nose and Throat Department of the British Military Hospital in Singapore on the 9th May, 1962. The patient's father thought the child had swallowed a fish bone about three days previously. Since then, she complained of increasing pain and difficulty in swallowing even fluids. She had also recently coughed up blood-stained sputum.

On clinical examination, although the child had walked into hospital, she looked ill and toxic. Her head was held stiffly and erect. Temperature was 103°, radial pulse rate 130 per minute and respiration rate 30 per minute. There was obvious fullness of the anterior aspect of the lower one third of the neck. The swelling was most marked, and tenderness exquisitely localised, in the region of the anterior border of the left sternomastoid muscle. There was no dyspnoea or dysphonia. All movements of the cervical spine were painfully restricted. Her mouth opened well, and mirror examination revealed frothy fluid in hypopharynx.

X-ray examination of the soft tissues of the neck revealed in the lateral view, evidence of a vertical T shaped opacity, probably of the nature of a fish bone, situated just anterior to the coronal mid-line of the pre-vertebral space. The latter space was

apparently increased in size. The horizon limb of the opacity was situated at the level of the disc space between the fourth and fifth cervical vertebrae. Its vertical limb extended downwards almost to the lower border of the sixth vertebra. A narrow irregular patchy column of translucent shadows was seen extending vertically downwards from behind the horizontal limb of the opacity to the level of the lower border of the seventh cervical vertebra (Fig. 1).

The patient was admitted to hospital, a diagnosis of perforation of the oesophagus by a foreign body having been made.

Under general anaesthesia, induced with cyclopropane, oxygen, and brevedil, and maintained with nitrous oxygen, oxygen, and Halothane, a laryngoscope was passed into the lower pharynx. Pus was seen to be present in the crico-pharyngeal region of the upper end of the oesophagus. After the application of suction toilet to the lumen of the gullet, a fish bone (Fig. 2) was visualised, with one spike of its T structure embedded in the posterior wall. The bone was removed in toto. Pus accompanied by bubbles of gas appeared immediately at the site of the perforation, which was about the size of a pin's head.

An incision was then made along the anterior border of the lower one third of the left sternomastoid muscle. The latter muscle was withdrawn outwards, and the omohyoid muscle downwards. Having retracted the carotid sheath laterally and the thyroid gland medially, an abscess presented in the depths of the wound over a distance of about five cms. It was encapsulated with a well defined fascia. Having opened it, thick greyish white pus, which had been under tension, was evacuated. The abscess cavity was then found on digital examination to extend widely behind a segment of the oesophagus. The gullet was rotated, after further mobilisation and retraction forwards and inwards of the thyroid gland, so that its posterior aspect could be inspected and lower limit of the abscess cavity seen. A small perforation approximately two mm in diameter was detected. Two corrugated rubber drains were placed in the retro-oesophageal space and each was brought out through an extremity of the wound. The edges of skin and platysma were brought together with interrupted silk sutures.

She was treated with intravenous fluid therapy for four days after operation. From then on, feeds were given through a Ryles tube until the tenth post-operative days when she commenced oral feeding. A course of Penicillin 250,000 units six hourly and Streptomycin 125 milligrammes twelve hourly was commenced prior to the operation and continued for ten days.

The child's general condition improved soon after the operation. On the second post operative day, her temperature and pulse rate had become normal and remained so throughout the remainder of her stay in hospital. Her toxic state subsided rapidly. The swelling of her neck soon resolved and her wound healed well by first intention, there having been little discharge from the drainage sites. X-Ray examination on the 12th May showed evidence of reduction in size of the prevertebral space and no interstitial translucent shadows. On the 23rd May, she was eating a normal diet without pain or difficulty and she was discharged to her home.

Bacteriological examination of pus from the abscess revealed on culture a mixed growth of coliform and streptococcal organisms resistant to penicillin and strepto-



Figure 1. Lateral X-ray of neck showing presence of foreign body, translucent shadows and probable increase of prevertebral space.



Figure 2. Fish bone magnified $2\frac{1}{2}$ times approximately

mycin but sensitive to chloramphenicol, aureomycin, terramycin, etc. Subsequent review of her progress on the 7th June, 1962 revealed that the child was very well and had no dysphagia or other symptoms.

Discussion

The radiological examination of the patient with a foreign body in the cervical oesophagus is the most valuable diagnostic procedure. The foreign body may prove to be radio-opaque. Furthermore, the presence of translucent shadows in the pre-vertebral space will indicate that perforation of the organ has already taken place.

From the point of view of the progress and the treatment of such a case, Furstenburg's (1929) invaluable studies of the fascial layers of the neck, in which he demonstrated the factors which favour descent of pus through the various planes, are of some clinical significance. He observed that lipiodol injected into the retro-visceral (retro-oesophageal) space does not spread to adjacent compartments of the neck, but could easily be visualised in the posterior mediastinum. He was of the opinion, that the latter space, probably forms the most important pathway between the upper cervical region and the mediastinum. He stated that the pretracheal fascia, having split to form the capsule of the thyroid gland, merges laterally with the carotid sheath and the layer of superficial fascia on the posterior surface of the sternomastoid muscle. On the posterior aspect of the gland, the pre-tracheal fascia again united to pass across behind the oesophagus and pharynx as the buccopharyngeal fascia. The pre-vertebral fascia passes laterally, having covered the muscles attached to the spine, to help form the carotid sheath. It would appear therefore, that the retro-oesophageal space is limited between the great vessels and the thyroid gland and between the latter gland and the oesophagus by the pre-tracheal fascia and its extensions to the carotid sheath and the buccopharyngeal fascia respectively. This latter fascia, it could be concluded, presented in the exploratory wound of the case reported, as the sheath covering the exposed abscess, preventing its spread into the adjoining pre-visceral space (Fig. 3).

The literature on this subject of anatomy recorded in five of our standard textbooks, and illustrations by one author, were referred to. In only Cunningham's *Manual of Practical Anatomy* (1958) was found, definite evidence to support Furstenburg's observations on why pus does not track forward between the thyroid gland and the oesophagus. The following is a quotation from the latter manual, "posteriorly loose fibrous strands connect the fascia on the lobe (of thyroid gland) with the fascia on the back of the oesophagus and with the pre-vertebral fascia." It is stated in *Gray's Anatomy* (1922) that the carotid sheath is connected to the neighbouring layers, (presumably the pre-tracheal and pre-vertebral) by loose areolar tissue. No mention is made of an extension of the pre-tracheal layer on to the wall of the oesophagus. In Last's (1963) textbook this latter anatomical feature is also omitted, and furthermore, it is stated that the space (retropharyngeal) passes freely behind the carotid sheath into the posterior triangle where pus frequently points. Mention in Johnson's *Synopsis of Regional Anatomy* (1963) is made only of the pre-tracheal fascia passing, when traced laterally from the thyroid gland, in front of the carotid sheath and fading away

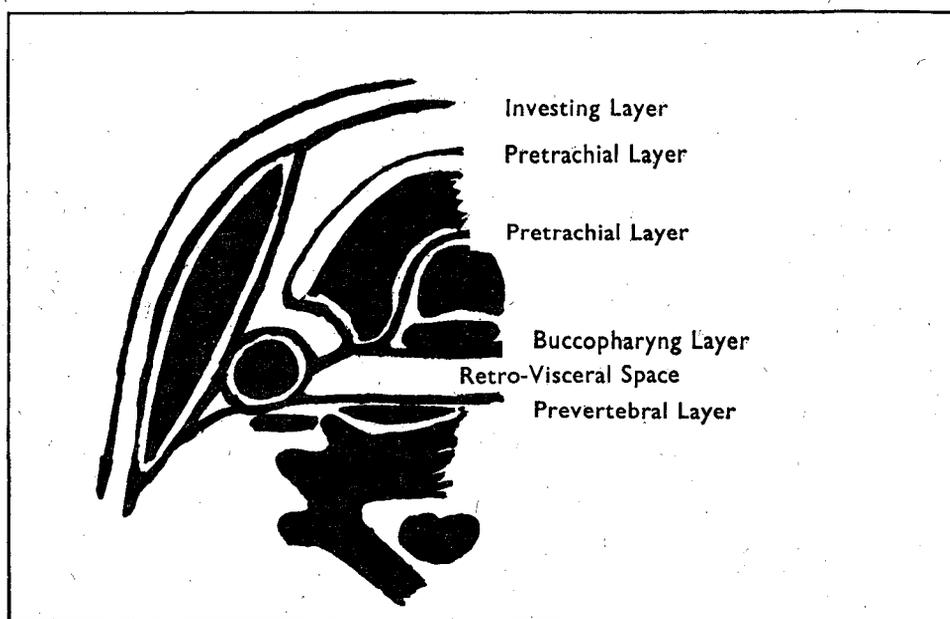


Figure 3. Diagrammatic representation of transverse section through the lower part of the neck demonstrating author's impression of the pre-tracheal fascia limiting the retro-visceral space.

on the deep surface of the sternomastoid muscle. Again in Jamieson's *Illustrations of Regional Anatomy* (1959) and in Cunningham's *Textbook of Anatomy* (1957) the blending of the pre-tracheal fascia with the carotid sheath is demonstrated only.

Summary

A case of perforation of the cervical oesophagus by a fish bone is reported. The interesting radiological features it presented with, stress the importance of radiological examination as a diagnostic procedure. The pathways of extension of infection in the retro-visceral space, mentioned in Furstenburg's anatomical discourse on the fascial planes of the neck, is referred to as being of some clinical significance in the progress and treatment of the case. References are made to some of our standard textbooks of anatomy.

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