On-line Case Report

A case of intramural oesophageal dissection secondary to nasogastric tube insertion

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ABSTRACT

Intramural oesophageal dissection is a rare disorder, caused by the interposition of a divisive force between the mucosal and muscular layers of the oesophagus, leading to their separation. We present a case of intramural oesophageal dissection, secondary to the accidental iatrogenic intramural insertion of a nasogastric tube. We discuss the aetiologies, presentation, investigation and treatment of intramural oesophageal dissection, and make recommendations on the management of suspected oesophageal perforation with prophylactic nasogastric tube insertion. We also discuss other complications associated with nasogastric tube insertion, and how these may be avoided.

Keywords: Oesophageal dissection – Oesophageal perforation – Food bolus impaction – Nasogastric tube insertion

A 77-year-old woman presented with a 12-h history of dysphagia, following suspected food bolus impaction. Six months previously, the patient had experienced another episode of food bolus impaction, investigated via contrast swallow study. This was normal, except for the incidental finding of lower cervical spine degenerative change, with marked anterior osteophyte formation.

Initial investigation at this visit was with a radiograph of the neck soft tissues, demonstrating a soft tissue mass shadow projected over the upper oesophagus, suggestive of a luminal foreign body. The patient was initially managed with carbonated drinks, intravenous fluids and buscopan; however, with no symptomatic resolution, the patient underwent rigid oesophagoscopy for suspected foreign body removal. After initial difficulties navigating the cricopharyngeus (due to the osteophytic changes previously noted), a food bolus was

identified at 17 cm, with surrounding mucosal trauma, but no perforation. After removing the bolus, the oesophagoscope easily passed to 25 cm. Post-procedure, a nasogastric tube (NGT) was inserted, and the patient kept nil-by-mouth, due to the mucosal trauma.

A chest radiograph (ordered to confirm NGT position) demonstrated the NGT reversing at manubrial level, ascending proximally, before making another U-turn to descend past the level of the original loop (Fig. 1). With the history of oesophageal trauma, there was concern regarding possible extramural NGT placement through a missed perforation. Water-soluble contrast swallow was performed, demonstrating two channels of contrast within the mediastinum; one poorly distending and continuous to the stomach, likely representing the true oesophageal lumen; and a second, retaining contrast, likely representing a blind-ending channel, commencing

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Figure 1 Aberrant course of the NGT as first noted on the post insertion chest radiograph.

at C6/7 level. No perforation was noted (Fig. 2).

With the patient stable, and showing no deterioration suggestive of perforation, she was advanced to soft diet, and discharged 2 days later. Out-patient gastroscopy one month later demonstrated a double lumen, consistent with intramural dissection (Fig. 3). The patient commenced a 6-month proton pump inhibitor course and, at follow-up, was well and asymptomatic.

Discussion

Nasogastric tubes

NGT insertion is a common procedure in hospitals, performed largely for two indications – fluid administration or gastric aspiration/decompression. Although generally safe, there are examples of associated complications – those secondary to NGT misplacement and those resulting from trauma from the NGT or its insertion.

Potential sites of misplacement include endotracheally, with ensuing aspiration should nasogastric feeding be commenced, and intracranially. Misplacement within the upper gastrointestinal lumen also occurs, with coiling within the

oropharynx or oesophagus a relatively common occurrence.

Traumatic complications can occur due to mucosal irritation, or from perforating injuries at insertion. Mucosal irritation can be minor, such as epistaxis and sore throats or more catastrophic (particularly in long-term placements), such as oesophago-arterial fistulas, and nasogastric tube syndrome. Perforation can occur partially, with sub-mucosal insertion or totally, with oesophageal or gastric perforation: the ensuing complications being dictated by the structure which is perforated into (e.g. mediastinitis, or pneumothorax).

There are recognised conditions which predispose to these complications, and which may lead to NGTs being contra-indicated. Recent mid-facial trauma or surgery (with the associated risk of intracranial insertion) are total contra-indications. Abnormal oesophageal anatomy may also complicate insertion – the presence of strictures or diverticula are relative contra-indications, with their increased perforation risk, and abnormalities such as tracheo-oesophageal fistulas predispose to tracheal misplacement.

Due to the serious implications of incorrect NGT insertion, a rigorous process for assessment of placement exists. A sample aspirate should be obtained, and tested

Figure 2 Water-soluble contrast swallow demonstrating two channels of contrast – one continuous through to the stomach and poorly distending, and a second channel retaining contrast, likely representing a blind-ending channel.

with universal indicator paper (litmus is contra-indicated); a pH < 5.5 indicates a gastric aspirate. If this is equivocal, then visualisation on chest radiograph of the NGT tip below the diaphragm, with the path of the NGT separate from the bronchial tree, confirms correct placement. Air insufflation with auscultation over the stomach, is not recommended.¹

Oesophageal intramural dissection

Oesophageal intramural dissection is caused by the

Figure 3 Endoscopy image of an oesophageal double lumen, consistent with intramural oesophageal dissection.

interposition of a divisive force between the mucosal and muscular layers of the oesophagus. Generally, the force is an expanding haematoma either: (i) spontaneous and intrinsic (e.g. in a bleeding diathesis), rupturing into the lumen and creating a false passage; or (ii) extrinsic, with foreign body related mucosal trauma causing an expanding sub-mucosal haematoma, and false lumen creation originating at the point of trauma.^{2,3} There are also instances of the divisive force being the accidental iatrogenic insertion of a foreign body between the layers, with false passage formation along the line of insertion.⁴ In cases of spontaneous intramural dissection, the patient typically presents with retrosternal pain and haematemesis.^{2,5} There may also be odynophagia and dysphagia, ranging from partial to complete.

Investigation is by a combination of radiological and endoscopic methods. Water-soluble contrast is sufficient to demonstrate the characteristic double-barrelled lumen; endoscopy may demonstrate the haematoma, or even directly visualise the two lumens.^{4,5}

Treatment is generally conservative, with proton pump inhibitors aiding resolution.⁵ There are recent instances of novel endoscopic techniques being used to relieve complex cases, with stents being employed in extensive circumferential dissections, and endoscopic needle-knife incision relieving complete obstruction secondary to total membranous occlusion of the lumen.^{3,4} Surgical intervention has almost no role, however.

Conclusions

It is hypothesised that, in this case, NGT insertion was the divisive force causing an incidence of intramural oesophageal dissection. This is supported by the absence of dissection on initial oesophagoscopy, and its

subsequent presence on the contrast study, with the NGT being the only intervention in the intervening period. We postulate that the NGT perforated through the patch of mucosal trauma noted at the level of impaction, causing an expanding dissection as it was introduced, before reaching an obstruction to further dissection and reversing, then again looping within the oropharynx and descending past the point of trauma to lie within the true lumen. The complicated anatomy through the cricopharyngeus, noted at oesophagoscopy, may have contributed to the aberrant path of the NGT. This hypothesis could have been tested if the contrast study had been performed with the NGT *in situ*, allowing clearer demonstration of the NGT path, in relation to the two lumens.

Our recommendation would be that, in cases of prophylactic NGT insertion following oesophagoscopy findings suggestive of possible perforation (and particularly

where complicating factors such as difficult anatomy exist), NGTs should be placed under direct vision to prevent inadvertent intramural passage.

References

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