Case report

Dysphagia due to oesophageal obstruction: A case report of unusual occupational aetiology

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HIGHLIGHTS

- The rare case of a large obstructive vertebral osteophyte in an elderly gentleman is described.
- Rarer still is the significant occupational history given, providing a strong case for aetiology.
- The importance of a thorough and systematic assessment in patients with dysphagia is emphasised.
- The importance of Barium swallow to investigate position and nature of obstruction is illustrated.

ARTICLE INFO

Article history:
Received 18 June 2015
Received in revised form 13 September 2015
Accepted 23 October 2015

Keywords:
Dysphagia
Vertebral osteophyte
Occupation

ABSTRACT

Introduction: We report the rare case of a patient presenting with dysphagia secondary to a large vertebral osteophyte, which formed from his previous occupation.

Presentation of case: A 76-year-old gentleman presented with a year-long history of dysphagia to solids, at the laryngeal level. He was otherwise well, with no red-flag symptoms. Nasoendoscopy showed a left-sided bulge obstructing the piriform fossa. Barium swallow demonstrated a large C4/C5 vertebral osteophyte. Excluding other abnormalities the patient’s dysphagia was determined to be due to the osteophyte. The patient mentioned carrying large (50 kg) bags of coal for his previous occupation. This chronic trauma was concluded to be the cause for the osteophyte.

Discussion: We use this case as an opportunity to outline mechanism of swallowing, and the causes and classification of dysphagia are additionally described. We also review the literature regarding vertebral osteophytes to contextualise the rarity of this case, especially in regard to the strong occupational association.

Conclusion: A structured and thorough history and examination in dysphagia is emphasized. It is important to enquire about ‘red-flag’ symptoms, suggestive of head and neck or upper gastrointestinal malignancy. Barium swallow is a critical investigation in dysphagia-it can also demonstrate large bony abnormalities, which is a rare causative factor.

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1. Introduction

The human swallow is a complex neuromuscular function, which is divided into a number of phases that proceed seamlessly from one to another, and involve a significant number of interplaying muscles.

We can thus appreciate that any in-coordination in this multistage process can lead to a difficulty in swallowing, defined as dysphagia [1].

Dysphagia is broadly categorised into 2 types by its particular aetiology: oropharyngeal dysphagia, i.e. a difficulty in the initiation of a swallow [1]; or oesophageal dysphagia, the sensation or experience of difficulty in the passage of a bolus from the throat to the stomach [2]. This categorisation is detailed further in our discussion.

In this report, we describe the rare case of a patient who presented with oesophageal dysphagia, secondary to a large vertebral osteophyte partly occluding his pharynx, which had formed as a
result of his previous occupation. Uniquely, the extensive occupational history and the tasks involved in his occupation are very closely associated with the resultant pathology.

A recent review of the literature by Dutta et al. [3] showed 73 cases identified in the literature of dysphagia due to vertebral osteophytes, all being due to Diffuse idiopathic skeletal hyperostosis (DISH) syndrome. Indeed, the literature states that in the vast majority of cases of dysphagia caused by vertebral osteophytes, the aetiology are multi-level conditions such as DISH or Ankylosing Spondylitis (AS).

A search of EMBASE and MEDLINE conducted by the authors using the words ‘dysphagia’ AND ‘osteophyte’, restricted to the English Language and to be present in title or abstract resulted in 214 results, with 17 excluded manually due to irrelevance. All but 6 reports were due to multi-level syndromes — either DISH or AS, and in a handful of studies the aetiology was post-traumatic following surgery. None described an occupational association with the development of the osteophyte.

2. Case presentation

A 76-year-old Caucasian gentleman and retired coal-miner, with a background of osteoarthritis and glaucoma, was referred to the ENT department with the complaint of non-progressive dysphagia to solids over the previous year. He felt that solids were eventually able to pass, and the resulting discomfort was appreciated more so on the left, at the level of his larynx. On occasion he had regurgitated food, but was pain-free and otherwise well. The patient’s voice remained normal and unchanged, and he denied any symptoms of dysphonia, haemoptysis, breathlessness or stridor. There was no history of weight loss or systemic features such as fevers or malaise.

Clinical examination of the oral cavity and palpation of the neck yielded no abnormality. Flexible nasoendoscopy performed in clinic showed a significant bulge on the left of the midline in the mid-cervical region, which appeared to partially obliterate the left pyriform fossa. The arytenoid cartilage was visible on the right but not the left. There were no mucosal changes suggestive of malignancy, and his airway was patent (Fig. 1). Given these clinical findings, it was felt that a benign structural obstruction was the most likely cause of his symptoms.

Barium swallow was thereafter performed, which revealed a large bridging vertebral osteophyte at C4/C5. This was causing a marked posterior indentation of the oesophagus (Fig. 2). There was no evidence of a pharyngeal pouch, nor any distal obstruction, and his ability to co-ordinate a swallow was preserved. Therefore the cause of the patient’s dysphagia was solely determined to be due to the osteophytic growth.

Upon further enquiry at follow up, the patient volunteered that he used to regularly carry 50 kg bags of coal on his left shoulder for several decades as part of his occupation. It was concluded that the chronic repetitive stress to his cervical vertebrae as a result of sustained periods of weight bearing work was the principal cause for the development of this osteophyte.

The patient was not keen on any further investigation or management, and felt that he could successfully manage this problem through dietary modification. He was therefore discharged from clinic.

3. Discussion

3.1. The mechanism of swallowing

An intact swallowing mechanism is one of the main factors in maintaining adequate nutrition. In the event that it becomes ineffective, the result can lead to choking, airway obstruction, or pulmonary aspiration with potentially fatal consequences [4]. The process of swallowing is divided into several phases, which through complex interplay between the oropharyngeal muscles and associated structures, allow for safe passage of food via the oesophagus through to the stomach (Fig. 3). The phases of swallowing are divided as follows [5]:

1. Oral Preparatory Phase: In this phase, food is enclosed in the mouth and pulverised into a food bolus with the introduction of saliva. The process of chewing keeps the food bolus between the upper and lower molar teeth by coordination of the buccinators muscle (facial nerve) and tongue (hypoglossal nerve). The act of swallowing is initially regulated by sensory afferents of the lingual, chorda tympani and glossopharyngeal nerves [6]. With the tip of the tongue at the alveolar ridge, keeping the bolus against the hard palate, it is then transported posteriorly. Nasal breathing continues throughout this stage with the labial muscles keeping the mouth shut [7].

2. Oral Transport Stage: This is the second voluntary stage, the end of which initiates the involuntary stages. Inspiration is inhibited at this point and the bolus of food is moved posteriorly through a rolling motion of the tongue against the hard palate. The endpoint is when the bolus passes the anterior faucal pillars and contacts the posterior pharyngeal wall into the oropharynx [8].

3. Pharyngeal Phase: At this stage, the nasopharynx and larynx are sealed to prevent aspiration, consequently activities such as breathing, chewing, and coughing are all inhibited. This stage is mediated by the medulla via the glossopharyngeal nerve.

Fig. 1. Successive photographs taken during flexible nasoendoscopy. *** indicates location of the pharyngeal swelling left of the midline and it’s associated obliteration of the left pyriform fossa.
Efferent action results in medial contraction of the palatopharyngeus muscles forming a slit-like orifice. There is concurrent upward contraction of the soft palate and retraction of the tongue. When the superior constrictors contract, the bolus is propelled inferiorly. A laryngeal sub-stage is described thereafter with three distinct components. The larynx and hyoid are pulled anterosuperiorly, enlarging the pharynx and creating a relative vacuum in the hypopharynx, it also relaxes the

![Diagram illustrating the relevant anatomy in swallowing and the component phases of swallowing as described in the main text.](image-url)
cricopharyngeus muscle. The true and false cords also adduct, the arytenoids contact the epiglottis — protecting the laryngeal inlet. Finally the epiglottis is pulled inferiorly creating a flap that directs the bolus laterally into the pyriform fossae. It is accepted that gravity plays a significant part at this stage — especially in the elderly [8].

4. Oesophageal Phase: This is largely an involuntary controlled mechanism that consists of the processed bolus being propelled inferiorly towards the stomach by peristalsis. The bolus is transported initially by striated muscle (upper one-third) then by smooth muscle (lower two-thirds). The relaxation of the cricopharyngeus sphincter muscle initiates this stage, followed by depression of the larynx. The bolus passes into the oesophagus where peristalsis, and finally relaxation of the lower oesophageal sphincter allow food through to enter the stomach. At this point the upper aerodigestive tract would have become patent again [9].

3.3. Vertebral osteophytes

A significant body of literature suggests that vertebral osteophyte formation and spondylosis are associated with occupational exposure, particularly that of heavy lifting and significant repetitive manual trauma [19–21]. There is additionally evidence supporting an association between occupational exposure and development of cervical spine spondylosis specifically, including limited evidence of its association with the mining occupation [22].

In our example, there has been determined, from history, examination, and investigative findings to be a strong correlation of the patient’s chronic heavy lifting, to the development of an ipsilateral osteophyte.

It has been reported that approximately 20–30% of patients with cervical osteophytes complain of dysphagia [23]. However, a single large osteophyte, so closely linked to a patient’s occupational activities, causing dysphagia, has not previously been described.

3.2. Dysphagia

Dysphagia is defined as a difficulty in swallowing. A distinction is made between oropharyngeal dysphagia, i.e. a difficulty in the initiation of a swallow [10]; or oesophageal dysphagia, the sensation or experience of difficulty in the passage of a bolus from the throat to the stomach [11]. It is with this broad division that the causes of dysphagia can begin to be classified [12].

Dysphagia is common and up to 5% of over-50s will suffer from this [13], and 16% of geriatric patients [14]. Oropharyngeal dysphagia is even more common in patients with chronic disease, especially nursing home residents suffering with feeding difficulties. In acute care, the incidence of dysphagia has been quoted as high as 33% [15].

Complications of dysphagia include aspiration pneumonia, malnutrition and can be fatal if not addressed and managed appropriately. A good and thorough history will help elucidate the anatomical site and likely cause of dysphagia in 80% of cases [16].

Oropharyngeal Dysphagia: Four highly specific symptoms have been identified to help identify oropharyngeal dysphagia [17]:

- Delayed or absent initiation of oropharyngeal swallow,
- Deglutitive postnasal regurgitation,
- Deglutitive cough,
- Requirement for repetitive swallows to achieve clearance of bolus.

A summary of the different causes of oropharyngeal dysphagia is presented in Table 1 [11].

Oesophageal Dysphagia: There are a number of causes, divided into structural and motility, as illustrated in Table 2 [12].

3.3. Vertebral osteophytes

Our case highlights a case of dysphagia caused by an obstructive anterior cervical osteophyte impinging upon the pharynx. This is a very unusual extrinsic obstructive cause for dysphagia at the pharyngeal stage.

Important causes of vertebral osteophytes include diffuse idiopathic skeletal hyperostosis (DISH), degenerative diseases of the cervical spine and ankylosing spondylitis [18]. Although these patients are usually asymptomatic, several cases of these patients presenting with upper digestive tract symptoms have been reported in the literature.

Although in our case the patient was happy to manage his symptoms conservatively with dietary modification and was not keen on any further investigation or management, it is worth exploring the management options available in this scenario.

As with the vast majority of structural pathology, management can be divided into conservative and surgical options.

Conservative therapy is advised for minimally bothersome symptoms, and with the patient’s wishes paramount. The core base is dietary modification, which consists of consuming soft foods and liquids [24,25], as adopted in our patient’s management. Dietician input and follow up may be helpful in monitoring and optimizing nutritional requirements by advising an appropriate selection foods and liquids tolerable to the patient. NSAIDs, steroids, and muscle relaxants have also been reported as occasionally helpful in reducing symptoms [25].

In the event that symptoms are significant, weight loss is observed, or where conservative management fails to control symptoms or is unacceptable to the patient, surgery may be considered.

In the majority of cases this involves surgical resection of the vertebral osteophyte through a standard anterior approach [25].

As this phenomenon of dysphagia from vertebral osteophyte is rare in itself, there is little data in the literature analysing outcomes from surgical resection in this manner, however a recent study assessing outcomes from 5 patients undergoing surgical resection of their vertebral osteophyte due to obstructive dysphagia found that Complete resolution of dysphagia was reported at 5–20 days after surgery, with no recurrence after an average follow-up time of 59 months [25].

Indeed, other studies have also supported the highly successful outcomes at short term follow up of surgical excision [26,27], with Laus et al. [26] showing that in a study of 3 patients with dysphagia due to vertebral osteophyte, surgical excision resulted in all patients being completely asymptomatic at 1–2 years follow up, and radiographically there was no recurrence of lesions.

However, in several instances, where the aetiology is DISH syndrome, recurrence of the osteophytes has been reported [28].

Complications of the procedure, although rare, do occur, and those reported include haematoma, recurrent laryngeal nerve palsy, and oesophageal perforation [24].

Similar results have been reported by others [26–28], although a number of complications, such as recurrent laryngeal nerve palsy, haematoma and perforation, are possible [24].
4. Conclusion

This case illustrates the importance of a detailed and thorough history, which will guide the clinician to the potential cause and level of dysphagia. Along with this it is invaluable to enquire about red flag symptoms that could be suggestive of potential head and neck or upper gastrointestinal malignancy.

We also illustrate here that a barium swallow is an essential study when investigating dysphagia, as it can also illustrate any bony abnormalities contributory to dysphagia.

Key points

- A thorough and detailed history will guide clinician to localise the dysphagia to a particular level, and reveal potential causes.
- Enquiry into red flag symptoms for malignancy will aid the exclusion of head and neck/upper GI malignancy as a cause for the dysphagia.
- Barium swallow is an important basic diagnostic study for dysphagia, but also useful for identifying bony abnormalities such as cervical osteophytes.

Ethical approval

Not required for this case report.

Funding statement

This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.

Conflict of interests

None.

Guarantor

Dr Navnit Makaram.
Mr Rohit Gohil.
Mr Samit Majumdar.

Consent

Consent obtained and attached as supplementary file in submission.

Research registry

Registered with Research Registry as part of the World Medical Association’s Declaration of Helsinki 2013 article 35.
Research registry UIN: researchregistry310.

Contributors

Dr Makaram has produced the report and literature review. Mr Gohil assisted in the production of the report, the literature review and was also involved in the care of the patient. Mr Majumdar oversaw the creation of the report and was additionally involved in the care of the patient.

Submission declaration

The work described herein has not been published in the form of an abstract or as part of a published lecture or academic thesis or an electronic preprint. It is not under consideration for publication elsewhere, its publication is approved by all authors. It will not be published elsewhere including electronically in the same form, in English or in any other language, without the written consent of the copyright-holder.
Acknowledgements

We would like to thank Dr Aiwain Yong, consultant radiologist at Ninewells Hospital, Dundee, for providing copies of the Barium swallow study and their verbal and written interpretation.

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