

Cervical Osteophytic Dysphagia: Single and Combined Mechanisms

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Abstract. Cervical osteophytes are common in the aging population. Dysphagia induced by cervical osteophytes, although uncommon, is an important and treatable cause of dysphagia that must be identified during the modified barium swallow. Previous authors have described osteophyte impingement as a cause for dysphagia. This report describes a case of this classic obstructive osteophytic dysphagia and one of combined osteophytic and neurogenic dysphagia. This is the first time that a combined mechanism is described in the literature.

Key words: Mechanism — Cervical — Osteophytic — Dysphagia — Modified barium swallow — Deglutition — Deglutition disorders.

Cervical osteophytes alone are a known cause of dysphagia secondary to direct pharyngoesophageal impingement. Anterior cervical osteophytes occur in 20%–30% of the elderly population [1] with cervical spondylosis often their cause. Ankylosing hyperostosis or diffuse skeletal hyperostosis (DISH), described by Forestier and Rotes-Querol [2], produces extensive osteophytes and has been recognized as a cause of dysphagia [3]. Twenty-eight percent of patients with cervical osteophytes complain of dysphagia [4] and 17% of patients with DISH are similarly symptomatic [5]. Cervical osteophytic dysphagia is an overlooked and often infrequently considered diagnosis that is treatable.

Dysphagia caused by extrinsic compression is commonly produced by degenerative osteophytes, the anterior osteophytic bridges of DISH, congenital bone bars [6], anterior herniation of calcified nucleus pulposus [7], atlantoaxial dislocation [8], and cervical trauma [9].

It can occur at any level although it is commonly seen at the fifth and sixth cervical vertebra which are levels of most cervical motion. The mechanism of dysphagia includes (1) direct impingement by large osteophytes, (2) impingement by local periosteophyte edema and inflammation, and (3) spasm of the adjacent cricopharyngeal musculature [10]. Two mechanically different cases of cervical osteophyte dysphagia are described in this report: (1) classic obstructive osteophytic dysphagia and (2) the effect of an osteophytic shelf in a patient with reduced laryngeal elevation after a stroke. To this author's knowledge combined neurologic and obstructive dysphagia has not been reported.

Case Reports

Case 1

The patient was a 76-year-old woman with a past medical history of cervical spondylosis who complained of dysphagia with solid food which had been progressing for several months; she had lost 40 pounds. She described morning neck stiffness and occasional pain on flexion. She was otherwise in good general health. We could find no history of gastrointestinal or constitutional symptoms that could otherwise explain her weight loss. Neurologic examination was nonlocalizing. She described regurgitation of solid boluses (cracker or meat) just after the swallow although she could swallow small amounts of liquid. The patient described paroxysms of coughing while eating any consistency of food and a wet voice quality after that. She was seen as an outpatient for a modified barium swallow by the "swallowing team" (radiologist and speech-language pathologist) for evaluation. Initial lateral fluoroscopic view showed a medium size bulbous osteophyte at the C3–C4 level causing marked anterior deviation of the hypopharynx at the level of the cricopharyngeal opening (Fig. 1). A modified barium examination observing swallows of puree, thin liquid, thick liquid (spoon and cup fed), bread, banana, and meat was performed. Oral phase of the modified barium examination was normal. Pharyngeal phase was timely and laryngeal elevation was normal. Epiglottic motion was slow and erratic. The cricopharyngeal opening was severely restricted and distorted by the C3–C4 osteophyte complex, allowing only small squirts of the bolus to pass. The patient had to swallow three or four times to empty the hypopharynx of a small-volume (5 ml) bolus. When

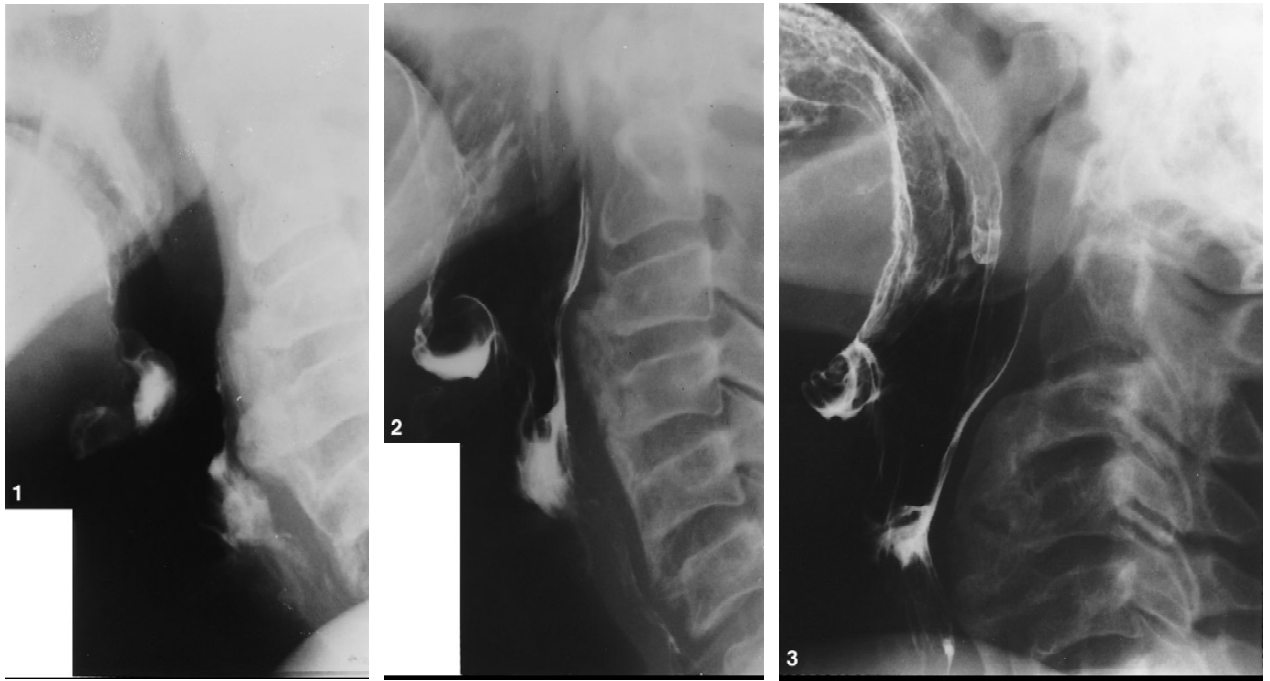


Fig. 1. Preoperative lateral neck radiograph during modified barium swallow of Case 1 with obstructive osteophyte dysphagia secondary to medium size C3–4 osteophyte.

Fig. 2. Lateral neck radiograph of Case 1 4 weeks after anterolateral osteophyctomy, demonstrating marked reduction in osteophyte size.

Fig. 3. Lateral neck radiograph of patient with combined osteophyte dysphagia and reduced laryngeal elevation demonstrating large C3–C5 osteophyte complex.

small boluses (5 ml) of bread, banana, or chopped meat were offered, the bolus would become temporarily impacted in the distorted cricopharyngeal opening causing cough or reverse peristalsis that carried the bolus back into the mouth. Very small amounts of solid could pass with small volume liquid washes. An uncomplicated anterolateral osteophyctomy was performed after consultation with a spine surgeon familiar with this diagnosis. We restudied the patient 5 weeks postoperatively and found marked improvement in function. Minimal distortion of the cricopharyngeal opening and no significant outflow obstruction of all consistencies were found at modified barium swallow. A moderate amount of prevertebral soft tissue enlargement, presumed to be postoperative edema, was noted during this study (Fig. 2). The patient remains free of swallowing symptoms on a full consistency diet 2 years after surgery.

Case 2

This patient was a 68-year-old woman with diabetes mellitus and atherosclerotic vascular disease 3 weeks postcerebrovascular accident. She had a mild left hemiparesis after a small right basal ganglion infarct. Multiple lacunar infarcts were found on neuroimaging studies. She was found to cough after pharyngeal phase initiation during the bedside evaluation of puree and thick liquids. The patient was awake and alert and could follow complex commands at the time of our examination. At modified barium swallow examination, a large bridging anterior C3–C5 osteophyte complex was found indenting the cricopharyngeal opening (Fig. 3). The oral phase was slow and mildly disorganized with timely initiation of the pharyngeal phase. Moderate reduction in laryngeal elevation and epiglottic tilt was found. The bolus was deflected off the shelf formed by the osteophytes directly into the open larynx (Fig.

4). This direct, large volume aspiration resulted in violent coughing and cyanosis that resolved without intervention. The deflection and aspiration of all consistency boluses was found. Almost the entire bolus volume entered the larynx. Upon consultation with a senior spine surgeon it was decided that an anterolateral osteophyctomy would be performed to reduce the deflection shelf in spite of the coexisting reduction in laryngeal elevation. We reasoned that removal of the obstructing lesion would offer the greatest hope for a safe swallow. The surgery was successful, with resolution of aspiration on the postoperative modified barium swallow (Fig. 5). The patient had no symptoms of dysphagia and has returned to a full consistency diet after surgery.

Discussion

Esophageal impingement by osteophytes was first reported in the thoracic esophagus by Zahn [11] in 1905. Mosher [12] described two cases of dysphagia caused by cervical osteophytes in 1926. In 1938, Iglauer [13] described the first cervical osteophyctomy for dysphagia.

In Case 1 moderate bulbous bridged osteophytes at C3–C4 and the associated inflamed anterior spinal soft tissue compressed the cricopharyngeal opening such that even the smallest solid bolus was unable to pass. No aspiration was noted as laryngeal closure was functional. In cases with even modest reduction in laryngeal closure, large, solid, postswallow, residual bolus could lead to

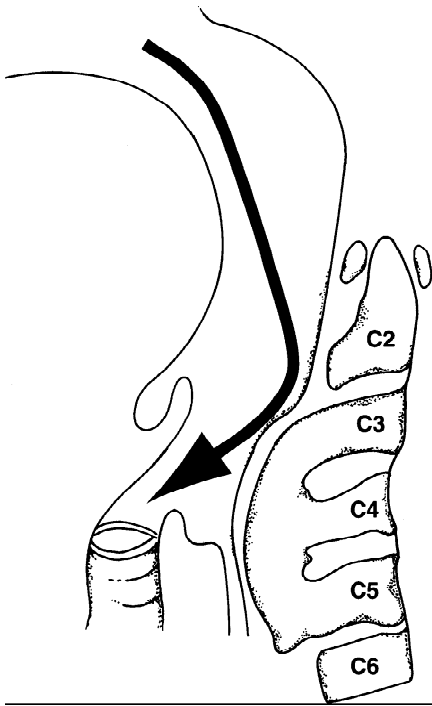


Fig. 4. Diagram of deflection path of bolus off of the osteophytic shelf directly into the glottis.

large volume overflow or direct aspiration. This condition could cause aspiration pneumonia and also possible bronchial obstruction owing to the solid nature of the aspirate. This case clearly demonstrates mechanical pharyngeal outlet obstruction secondary to the osteophytes.

Case 2 demonstrates a mechanism of pharyngeal osteophytic dysphagia not previously reported. No similar case of dysphagia caused by a stroke, complicated by a preexisting osteophytic bar has been reported in the literature. The term “osteophytic shelf” first was used by Davies et al. [14] in their report of dysphagia but they did not describe the deflection mechanism. This combined mechanism should be considered in elderly patients or patients with DISH who are being evaluated for dysphagia after a stroke.

There are three major characteristics of osteophytes that may cause dysphagia: (1) large osteophytes that cause mechanical blockage of the esophagus or hypopharynx; (2) impinging osteophytes that coexist with decreased laryngeal closure may act additively to cause more severe dysphagia than if present alone (osteophytes at fixed points in the aerodigestive tract described at the cricoid cartilage [C6] or gastroesophageal junction, can cause significant obstruction); (3) inflammatory reaction around rapidly enlarging osteophytes which may incite periesophagitis or pharyngitis that can physically worsen impingement causing dysphagia [15]. Occasionally, transient osteophytic dysphagia can be treated with antiin-



Fig. 5. Lateral neck radiography during modified barium examination 4 weeks after anterolateral osteophyctomy.

flammatory drugs with improvement of swallowing function by decreasing the amount of local inflammatory soft tissue. In severe cases, surgical excision of the bony mass is immediately effective. Reossification has been described more than four years after excision as reported by Hirano [16].

The presence of osteophytes, when found during the modified barium swallow examination or on radiographs of the neck, should raise the suspicion of osteophyte-related dysphagia. When patients are referred for possible neurologic dysphagia, the presence of cervical osteophytes and their combined role in the etiology of dysphagia should be considered when making the diagnosis; a correct diagnosis may result in successful treatment and a return to normal function.

Acknowledgment. The author wishes to thank Mary R. Reilly, M.S., CCC-SLP for her editorial assistance.

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