KJCCM
Korean J Crit Care Med
2017 February 32(1):74-78 / https://doi.org/10.4266/kjccm.2016.00409
ISSN 2383-4870 (Print) · ISSN 2383-4889 (Online)

■ Case Report ■

Recurrent Aspiration Pneumonia due to Anterior Cervical Osteophyte

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A 74-year-old man presented with recurrent vomiting and aspiration pneumonia in the left lower lobe. He entered the intensive care unit to manage the pneumonia and septic shock. Although a percutaneous endoscopic gastrostomy tube was implanted for recurrent vomiting, vomiting and aspiration recurred frequently during admission. Subsequently, he complained of neck pain when in an upright position. A videofluoroscopic swallowing study showed compression of the esophagus by cervical osteophytes and tracheal aspiration caused by an abnormality at the laryngeal inlet. Cervical spine X-rays and computed tomography showed anterior cervical osteophytes at the C3-6 levels. Surgical decompression was scheduled, but was cancelled due to his frailty. Unfortunately, further recurrent vomiting and aspiration resulted in respiratory arrest leading to hypoxic brain damage and death. Physicians should consider cervical spine disease, such as diffuse skeletal hyperostosis as an uncommon cause of recurrent aspiration pneumonia.

Key Words: hyperostosis; pneumonia, aspiration; vomiting.

Diffuse idiopathic skeletal hyperostosis (DISH) is a slowly progressive, relatively common disease in the elderly, but many patients have no symptoms [1,2]. Anterior cervical osteophytes rarely cause compression of the esophagus, and even more rarely, of the upper airway, making difficult to intubate [3-5]. However, the causal inferences between dysphagia / airway obstruction and DISH received little attention [6]. We present a case of a 74-year-old man with diabetes mellitus and heart disease who had recurrent vomiting, aspiration pneumonia, and late neck pain due to anterior cervical osteophytes.

Case Report

A 74-year-old man was seen in our emergency department with fever, vomiting, and dyspnea lasting for 1 week. He had poorly controlled diabetes mellitus for the past 13 years, had undergone coronary artery bypass grafting 6 years earlier, and underwent percutaneous coronary intervention 1 month earlier. On examination, his temperature was 38.0°C, with tachycardia (106 beats per minute) and a SpO_2 of 94%. There were coarse inspiratory crackles at both lung bases.

Received on May 4, 2016 **Revised** on July 26, 2016 **Accepted** on August 18, 2016
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*No potential conflict of interest relevant to this article was reported.

A chest X-ray showed patchy consolidation in both lungs and a pleural effusion. After admission, influenza type B was confirmed, in addition to aspiration pneumonia. Esophagogastroscopy showed chronic gastritis and an esophageal ulcer. A percutaneous endoscopic gastrostomy (PEG) tube was implanted for the recurrent vomiting. Nevertheless, the vomiting and aspiration persisted. He also complained of neck pain when he positioned is head up. A videofluoroscopic swallowing study (VFSS) showed compression of the esophagus by cervical osteophytes and tracheal aspiration caused by an abnormality at the laryngeal inlet (Figure 1). Cervical X-rays and computed tomography showed anterior cervical osteophytes at the C3-6 levels causing malposition of the upper airway and compression of the esophagus (Figure 2). There were also degenerative osteophytes on the upper thoracic vertebra and calcification of the posterior ligament of the spine. Surgical decompression was scheduled, but was cancelled due to his frailty. Because the patient could communicate with the family and expectorate well, the preemptive tracheostomy was not considered. While waiting for clinical improvement before the surgical osteophytectomy, unexpected massive aspiration and chocking leading to respiratory arrest occurred. Unfortunately, about 15 minutes- cardiopulmonary resuscitation resulted in hypoxic brain damage and death.

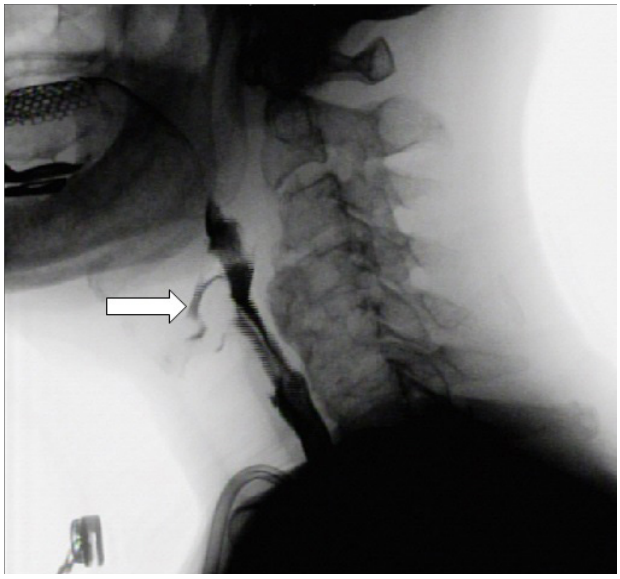

Figure 1. VFSS shows diffuse idiopathic skeletal hyperostosis of the cervical spine and anterior diversion of a bolus of barium into the laryngeal inlet (white arrow), secondary to osteophytes. VFSS: videofluoroscopic swallowing study.

Discussion

Anterior cervical osteophytes are commonly found in the elderly persons, although they are not frequently diagnosed [4,7]. DISH is one of the most common causes of anterior cervical osteophytes-induced dysphagia [8]. The etiology of this condition is unknown. DISH is more common in men and in the sixth decade of life. According to Resnick's definition for the diagnosis of DISH, three major criteria must be met [9]. (1) presence of ossification along the anterior longitudinal ligament involving at least four contiguous vertebrae; (2) absence of extensive radiographic evidences implying degenerative disc disease; and (3) absence of sacroiliac joint sclerosis or intra-articular osseous fusion.

The diagnosis of DISH is made with cervical spine radiographs in addition to complete history and physical examination [4,7]. However, a simple lateral X-ray of the cervical spine is not regularly performed when a patient

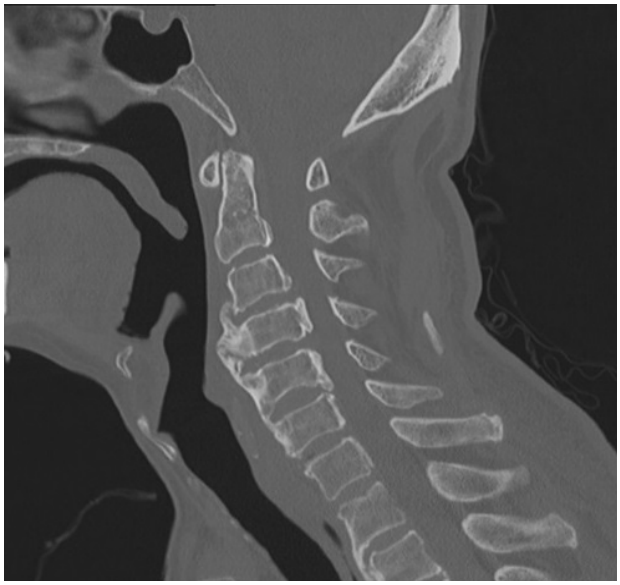

Figure 2. Cervical computed tomography shows anterior osteophytes at the C3-6 and T1-2 levels.

https://doi.org/10.4266/kjccm.2016.00409

complains of dysphagia [10]. Computed tomography may be useful to delineate the bony anatomy in relation to the surrounding soft tissues [11]. Fiberoptic endoscopic evaluations of swallowing or a VFSS are important for confirming the disease in a patient with dysphagia and aspiration [7].

DISH is slowly progressive, most often causes no symptoms, and is overlooked by patients and physicians [1,12]. If symptomatic, the most common symptom of cervical spine osteophytes is discomfort when swallowing [13]. Laryngeal signs (dyspnea, dysphonia, cough, and aspiration) due to osteophytes have rarely been reported [12,14]. The C4-5 cervical level is involved most commonly; this is where the esophagus is nudged and can explain why most patients complain of dysphagia [8]. First, aspiration event can be caused by large osteophytes at C3-4 directly interrupting laryngeal elevation and closure in the swallowing phase. Additional aspiration can be followed by severe obstruction of the esophagus due to food stasis [4]. Clinically significant airway obstruction resulting from anterior cervical osteophytes has been rarely reported [15,16]. The pathogenesis is infection superimposed on ulceration of the cricoid by osteophyte and secondary vocal cord paralysis.

The causes of dysphagia or aspiration include various diseases such as cerebrovascular neurological disease, tumor, esophageal lesions or gastroesophageal reflux. Because most elderly patient has another disease related to dysphagia, the diagnosis of cervical osteophyte is difficult and can be missed. In this case, our patient complained of only neck pain when placed in a head-up position and reported no dysphagia, we did not suspect the aspiration by cervical osteophyte. Therefore, cervical spinal disease, albeit rare, should be included in list of differential diagnosis of aspiration pneumonia.

The management of patients with cervical osteophytes depends on symptom severity. Slowly growing osteophytes are tolerated well. An "initial event" such as aspiration, regurgitation, asphyxia, sleep apnea, viral respiratory infection or cervical trauma is thought to result in dysphagia or airway obstruction due to swelling of soft tissue around the esophagus [3,6]. The first treatment of dysphagia includes diet modification, position change at swallowing, and anti-reflux medication [3,6]. In older patients, the risk of developing aspiration pneumonia is increased because of the reduced cough reflex [4]. Surgical resection should be considered when conservative medical management fails and respiratory symptoms continues [12,17]. In patients whose general condition is too precarious to perform anesthesia, the alternative is to propose enteral nutrition via PEG tube [12]. In our patient, surgical decompression was delayed by his frailty and insertion of PEG tube was performed. Unfortunately, unexpected massive aspiration and chocking leading to respiratory arrest was occurred when he stayed in general ward. We guessed that osteophytes at C3 may compress the posterior pharyngeal wall and cause tracheal aspiration and airway obstruction [16]. Because obstruction of the upper airway was suspected and other therapeutic solutions failed, this case makes up the indication for surgical intervention. Stabilizing the airway and performing a tracheostomy may be safe considering of his cervical immobility. Physicians should pay attention to osteophyte-induced respiratory compromise as well as osteophyte-induced dysphagia in patients suspected of DISH. In a review of previous cases, most patients noted symptomatic improvement after surgery [3-8].

The prevalence of DISH was reported to be 3.8-25% [18]. The prevalence of DISH tends to increase with age and differs according to races. The previous study reported that the association between metabolic factors including obesity, type 2 diabetes, metabolic syndrome and DISH [19]. Growth hormone, insulin or insulin like growth factor in patients with DISH target the chondrocytes and mesenchymal cell linking to new bone formation in the pathophysiology of DISH [19]. Zhang et al. [20] reported that DISH may become more widespread due to its association with age, obesity, and type 2 diabetes mellitus. Further studies are needed to know whether lifestyle modification and better glycemic control might reduce or arrest the progression of DISH.

In conclusion, cervical spine osteophytes are common

in the elderly, but rarely symptomatic. The most common symptom is dysphagia, which is seen in many illnesses. The diagnosis of cervical osteophytes is likely to be missed due to a lack of consideration and the management of other acute critical problems. However, this disease can cause aspiration and airway compression leading to a catastrophic result like death. Therefore, physicians should consider cervical spine osteophytes as a cause of life-threatening vomiting and aspiration in elderly patients.

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https://doi.org/10.4266/kjccm.2016.00409