

Dysphagia and Dyspnea Caused by Large Anterior Cervical Osteophyte

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ABSTRACT

Background Data: Unfortunately, large anterior cervical osteophytes are a forgotten cause of dysphagia and dyspnea. They can cause marked change in diet habits or interfere with patients' daily activities and sleep without significant neck pain or radicular pain. Diffuse idiopathic skeletal hyperostosis, ankylosing spondylitis, degenerative changes, and prior trauma including surgery can cause cervical osteophytes. Conservative medical treatment and diet modification may be a useful option when treating these patients; however, surgery may be mandatory, in particular with sever progressive symptoms not responding to conservative measures with excellent results and accepted incidence of complications.

Study Design: This is a retrospective clinical case study.

Purpose: To highlight this uncommon cause of dyspnea and dysphagia and define the possible management strategies.

Patients and Methods: This study was conducted in Mansoura University Hospital on nine patients presented with dysphagia, dyspnea, or both. The cause of their symptoms was large anterior cervical osteophytes. Six patients were males and 3 were females with their age ranged from 53 to 75 years. All patients were assessed by X-ray, CT, and MRI of the cervical spine and underwent fiber optic nasoendoscopy to assess posterior pharyngeal wall and other causes of upper airway obstruction. All patients had a trial of conservative measures including anti-inflammatory, antireflux medication, corticosteroids, diet modification, and consultations with specialists in rheumatology and speech and swallowing therapy.

Results: Of the 9 patients, three patients improved on the above-mentioned conservative measures, and one patient who presented with stridor underwent urgent tracheostomy and refused further surgery. Five patients who failed conservative therapy for at least three months underwent surgical excision of their osteophytes through anterior cervical approach. Improvement of surgical group was satisfactory according to the Dysphagia Scoring System.

Conclusion: Although large anterior cervical osteophyte is a rare cause of dysphagia and dyspnea, it should be checked and excluded especially in elderly patients. Adequate conservative therapy is a valid effective option; however, surgery in some of these patients may be simple, safe, and effective. (2019ESJ188)

Keywords: Osteophytes; Cervical; Dysphagia; Dyspnea

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INTRODUCTION

Large anterior cervical osteophyte is a forgotten cause of dysphagia and dyspnea which can cause marked changes in diet habits or interfere with patients' daily activities and sleep without significant neck or radicular pain. Causes of cervical osteophytes include diffuse idiopathic skeletal hyperostosis, ankylosing spondylitis, degenerative changes, and prior trauma including surgery.^{1,13}

Rotés-Querol was the first person to describe diffuse idiopathic skeletal hyperostosis (DISH) in 1950. It is a common rheumatologic condition with two main diagnostic criteria including hypertrophic anterior osteophytes of the vertebrae and progressive ossification of the anterior longitudinal ligament of the spine.^{5,8} In 1926, Mosher¹¹ first described dysphagia due to large anterior cervical osteophyte. It is well known that a thin layer of soft tissue is the only barrier between cervical spine and the posterior pharyngeal wall. Below the level of the glottis, the esophagus lies directly in front of the anterior border of the cervical vertebrae starting from C4 and descending downwards. This explains the fact that osteophytes above C4 affect pharynx and others below C4 affect either esophagus or pharynx.³

On the other hand, the exact mechanisms of airway obstruction in these patients have not yet been clearly identified. Many mechanisms have been suggested such as intrinsic and extrinsic compression of the larynx, inflammation and edema within the glottis or pharyngeal wall, and mechanical restriction or neuromuscular impairment of vocal cord movement.⁷

Within the same context, the associated impairment of vocal cord mobility in these cases remains uncertain, but three mechanisms have been proposed by Giger et al.⁷ to be responsible for this association, including paresis of terminal laryngeal nerve fibers, traumatic affection of the lateral and posterior cricoarytenoid muscles, and

direct involvement of the cricoarytenoid joint. The patients with dysphonia due to these osteophytes may have vocal cord edema or recurrent laryngeal nerve injury.²

The aim of this study is to highlight this uncommon cause of dyspnea and dysphagia and define the possible management strategies.

PATIENTS AND METHODS

This retrospective study was conducted in the Neurosurgery Department, Mansoura University Hospital, from 2015 to 2018 on nine patients presented with dysphagia, dyspnea, or both. The cause of their symptoms was large anterior cervical osteophytes. Six patients were males and 3 were females with their age ranging from 53 to 75 years. (Table 1)

Thorough patients' personal history including onset and progression of patient complaints and symptoms indicating associated motor, sensory, or sphincteric deficits. Family history of similar conditions, if any, was also reported.

Patients were assessed clinically, undergoing general and neurological examination for associated neurological deficits due to associated cervical pathology. A modified MRC scale was used to assess the motor power of the affected limb as well as muscle tone and reflexes were assessed to detect myelopathic affection. Sensory examination was utilized to detect any associated sensory deficits.

We used a simplified Dysphagia Scoring System¹⁶ to evaluate patients presenting with dysphagia: Grade 0, able to eat normal diet/no dysphagia; Grade 1, able to swallow some solid foods; Grade 2, able to swallow only semisolid foods; Grade 3, able to swallow liquids only; Grade 4, unable to swallow anything/total dysphagia.

Patients were assessed by X-ray, CT, and MRI of the cervical spine to define the level and size of the osteophytes (Figures 1 and 2). They could demonstrate pharyngeal and esophageal

compression if present. MRI can also reveal any associated cervical disc pathology.

Patients underwent fiber optic nasoendoscopy to assess posterior pharyngeal wall and other causes of upper airway obstruction (Figure 3). As assumed by ENT team in this study, barium swallow was not necessary at the moment as evident static obstructive pathology was detected during awake telescopic office examination (Figure 3).

All patients had an adequate trial of conservative measures including anti-inflammatory, antireflux medication, corticosteroids, diet regulation, and consultations with specialists in rheumatology and speech and swallowing therapy for at least three months.

Patients who responded well to conservative treatment were followed up for a period of three to six months and were prescribed activity modification to prevent progression of cervical spondylosis. Patients who failed conservative measures were prepared for surgical removal of the osteophytes after routine labs and preoperative medical evaluation.

Surgical Technique:

Surgery was done under general anesthesia. Patient was positioned in supine position with neck extension with pillows under the shoulder. Transverse neck incision at the level of the offending osteophyte was made and was confirmed using intraoperative fluoroscopy. After dissection through the layers of the neck, the osteophyte was adequately visualized and demarcated. With the surrounding tissues being protected, a high-speed drill was used to surgically excise the osteophytes completely until flushing with the anterior vertebral body of adjacent segment. Completeness of osteophyte excision was confirmed intraoperatively both visually and fluoroscopically. The wound was then closed in layers over a drain (Figure 4).

Postoperative patients were submitted for routine X-ray and MS-CT of the cervical spine to assess osteophyte removal and esophageal patency. All patients were clinically followed up for three to six months at the outpatients' clinic.

RESULTS

A total of nine patients were enrolled in this study with mean age of 65 (range, 53 to 75). Seven patients were above 60 years old. Six patients were males and three were females. Five patients presented with dysphagia, two patients presented with dyspnea, one with both dyspnea and dysphagia, and one patient with stridor. According to this system, 3 patients were grade 0; 4 patients, grade 2; 3 patients, grade 3. Duration of symptoms varied from two to eighteen months with mean of 8.22 months. C3-C4 level was in 3 patients, C5-C6 in 2 patients, C2-C3 in one patient, and C4-C5 in one patient; DISH syndrome was presented in two patients (Table 1).

Three patients improved within three months on medical conservative measures and were followed at the outpatients clinic. One patient with DISH syndrome who had a history of mild dysphagia was presented with acute stridor and underwent urgent tracheostomy which resolved his stridor. This patient was consulted for surgical excision of osteophytes, but he refused surgery and preferred to have permanent tracheostomy and diet modification.

Five patients underwent surgical excision of their osteophytes with marked improvement of their presenting symptoms after surgery. According to Dysphagia Scoring System, one patient improved to Grade 1, and four to Grade 0.

During the surgery, one of these patients (Case No. 9) who had a history of long-standing dysphagia (18 months), experienced an esophageal tear due to marked adhesions, inflammation, and prolonged compression of the esophageal wall. This tear was repaired intraoperatively by ENT surgeon followed by nasogastric tube insertion and the patient started oral feeding five days later with no further complications and smooth postoperative course. Another patient (Case No. 3) had superficial wound infection which was improved with antibiotics after culture and sensitivity testing and repeated dressing.

Table 1. Summary of patient's demographic data and management.

Case	Age	Sex	Presentation	Dysphagia	Duration	Affected Level	Management
1	60	Male	Dysphagia	G 3	5m	C3-4	Surgical
2	64	Male	Dysphagia	G2	3m	C2-3	Conservative
3	75	Female	Dysphagia	G2	12m	C3-4	Surgical
4	70	Male	Stridor	G0	6m	DISH syndrome	Tracheostomy
5	69	Female	Dysphagia	G2	7m	C5-6	Surgical
6	68	Male	Dyspnea	G0	9m	C3-4	Conservative
7	58	Male	Dyspnea & Dysphagia	G3	8m	DISH syndrome	Surgical
8	53	Female	Dyspnea	G0	6m	C4-5	Conservative
9	72	Male	Dysphagia	G2	18 m	C5-6	Surgical

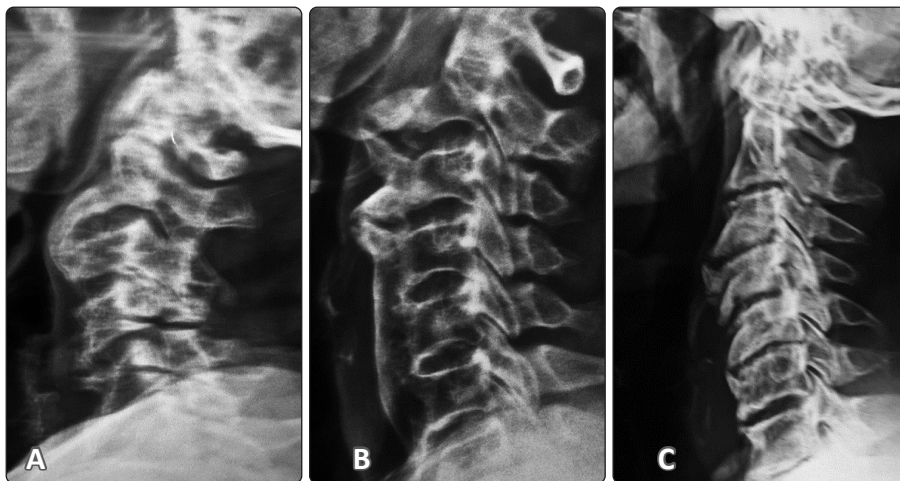


Figure 1. X-ray cervical spine lateral view showing (A) large C2-3 osteophyte (Case No.2) (B) DISH syndrome with large C2-3 and C3-4 osteophytes (Case No.4) (C) C3-4 and C5-6 osteophytes (Case No. 6).

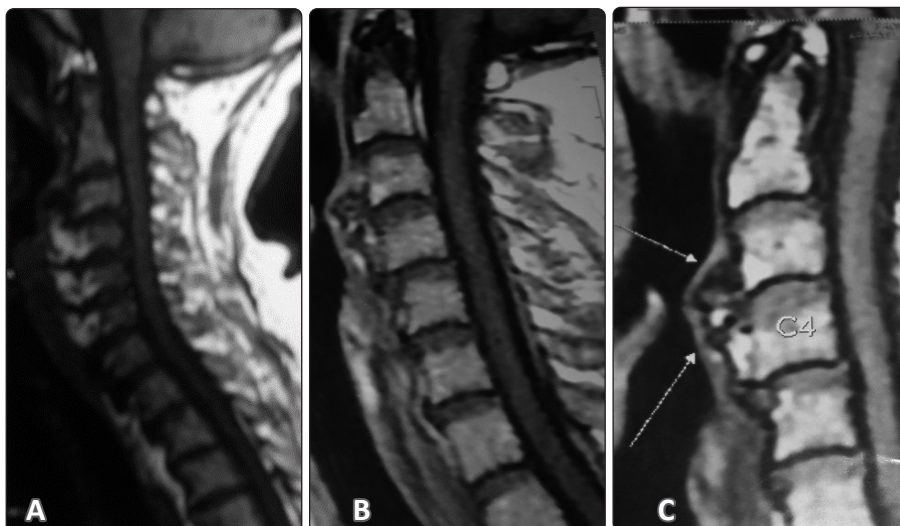


Figure 2. MRI T1 weighted images showing styles of osteophytes (A) DISH syndrome with multiple anterior osteophytes (Case No.7) (B, C) T1 images show large anterior C3-4 osteophyte.

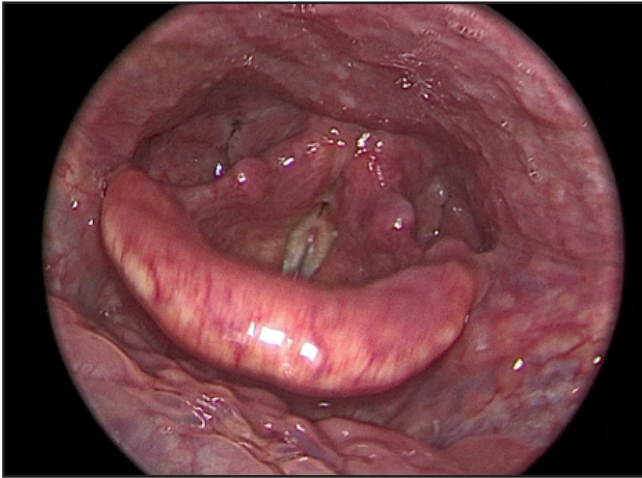


Figure 3. Fiber optic nasendoscopy showing osteophyte bulging into posterior pharyngeal wall and was taken by our colleague in ENT colleague (Case No 1)

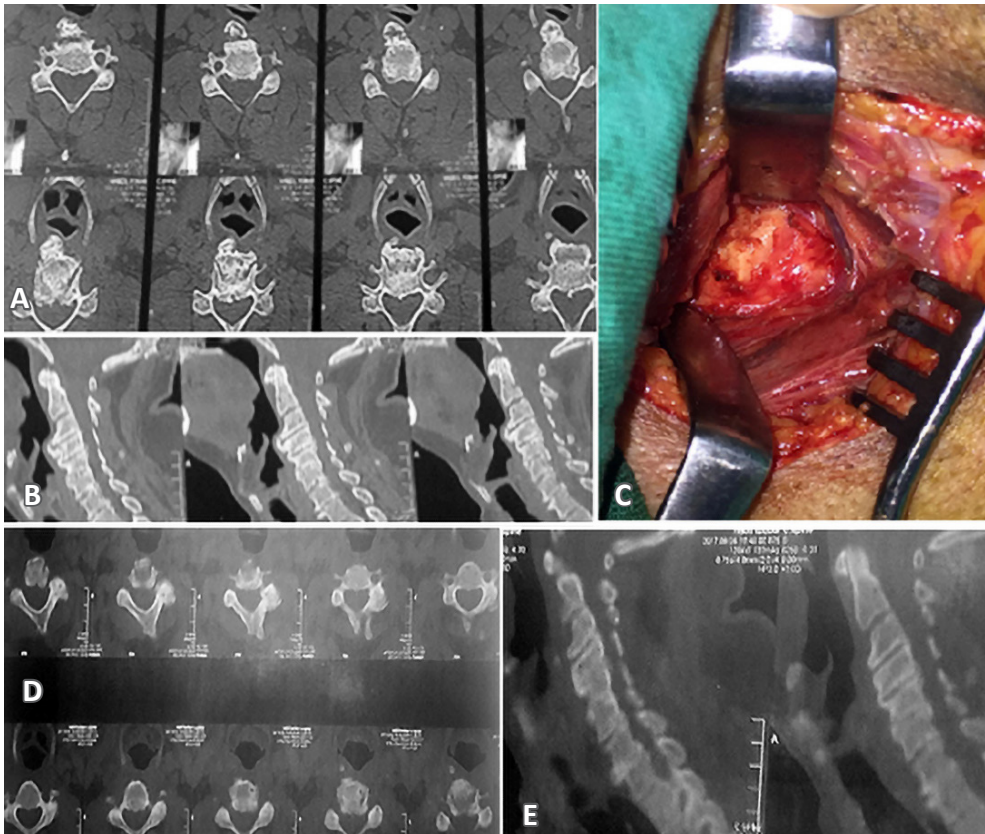


Figure 4. Preoperative CT cervical spine showing the osteophyte compressing the esophagus. (A) Axial cuts. (B) Reformating of CT cervical spine. (C) Intraoperative view of the osteophyte). Postoperative CT cervical spine after osteophyte removal. (D) Axial cuts. (E) Reformating of CT cervical spine. (Case No.1).

DISCUSSION

Degenerative process affecting cervical spine usually leads to radiculopathy or myelopathy with formation of posterior osteophytes. Formation of these osteophytes in the anterior part of the vertebrae commonly leads to swallowing difficulties caused by extra pressure on the esophagus or the larynx, which is usually manifested by dysphagia or dyspnea.⁹

Many mechanisms have been described to explain the occurrence of dysphagia in cases of enlarged anterior cervical osteophytes. These mechanisms include mechanical distortion of the esophagus secondary to the mass effect of a large anterior osteophyte or the presence osteophytes which induce inflammation around the esophagus with subsequent edema and cricopharyngeal spasm. Presence of osteophytes opposite to a fixed point of the esophagus like at the level of the cricoid cartilage (C6 level) is also a common cause of dysphagia. According to this, many authors have recommended the trial use of steroid as a first-line treatment in cases of osteophytes before the surgical approach.¹³

Some other authors assume that ventral osteophytes can cause defective swallowing through four mechanisms: defective protection of the upper airways by limited motion of the epiglottis; partial glottal closure during deglutition when osteophytes limit the motion of the vocal fold; limited upward and anterior movement of the larynx; bulging in the wall of hypopharynx and hindering the transport of the food.¹³

Anterior cervical osteophyte is a common degenerative disease of the cervical vertebrae, and it is mostly manifested in males in the seventh decade of age according to the results of a recent Korean study. The overall prevalence of this condition in adults ranges from 2.9% to 4.1% with tendency to increase with age. The most commonly affected vertebrae are C5 to C6 (40%),

followed by C4 to C5 (23%), C3 to C4 (14%), and C2 to C3 (14%).⁶

These results are very similar to ours as the mean age of our patients was about 65 years and more than 60% of them were males. On the other hand, the most affected levels in our patients were C3-C4 (33.3%), followed by C4-C5 (22.2%). Some authors¹⁵ assume that DISH syndrome is the most common cause of dysphagia due to anterior cervical osteophytes. The prevalence of this disease is 5–15% in the elderly (above 60), 17–28% of them having this disease along with dysphagia. In our results, we also found that most cases were above 60 years (77.78%) and the prevalence of DISH syndrome in our series was 22.2%.

Two main treatment alternatives are available for management of anterior cervical osteophytes; conservative and surgical methods. The conservative management includes the use of antibiotics, anti-inflammatory drugs, steroids, and muscle relaxants. It has been reported that the conservative treatment could reveal good results in mild to moderate cases through reduction in the edema and inflammation, but it is not fundamental treatment of osteophytes itself. Surgical management is indicated in cases of severe reduction in body weight or failure of medical treatment.⁴

This is similar to our attitude: all our patients received a trial of conservative medical measures including anti-inflammatory, antireflux medication, corticosteroids, diet modification, and consultations with specialists in rheumatology and speech and swallowing therapy. Three of our patients (33.3%) improved on these measures which is considerable percentage of success.

Some authors¹² assumed that surgical excision of the offending osteophytes without fixation is recommended if symptoms are severe or if the patient does not show improvement on conservative measures. Follow-up cervical radiography confirmed complete excision. In our series, we also preferred to perform

osteophyctomy only without fusion in patients who failed conservative medical measures.

It is reported that among 30 cases that underwent surgery, 28 cases showed immediate improvement postoperatively, while the remaining 2 cases demonstrated a delayed improvement. The 9 cases who underwent surgery by Oppenlander et al.¹² showed immediate postoperative improvement. McCafferty et al.¹⁰ recorded that the possible explanation of delayed improvement is chronic inflammation or fibrosis of the esophagus. Transient paralysis of the recurrent laryngeal nerve, esophageal fistula, hematoma, and, rarely, infection are the most reported complications after surgical interference.

We performed surgery in five patients; all of them showed improvement early postoperatively. The complications also were accepted as we had a case of intraoperative esophageal injury which was repaired with no further events and these results are comparable to the other reported results.

Although there is still a need to have a study that compares the effectiveness of conservative and surgical treatments, the literature suggests that osteophyte removal is supposed to be highly effective when nonsurgical measures fail.¹⁴

The main limitation of this study was that this condition is rare and the awareness of this cause of dysphagia is not established. The small number of cases included in this study and also in the literature makes it so difficult to have a solid consensus about this condition.

CONCLUSION

Although large anterior cervical osteophyte is a rare cause of dysphagia and dyspnea, it should be checked and excluded especially in elderly patients. Adequate conservative therapy is a valid effective option, yet surgery in some of these patients may be simple, safe, and effective.

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الملخص العربي

صعوبات البلع والتنفس الناتجة عن التواءات العظمية الامامية الكبيرة للفقرات العنقية

البيانات الخلفية: لسوء الحظ تعتبر هذه التواءات العظمية من الاسباب المنسية لصعوبات البلع والتنفس ورغم قدرتها علي احداث تغيير ملحوظ في العادات الغذائية والنشاطات اليومية للمرضي دون ان تسبب الم شديد بالرقبة او الزراع. وهي قد تتكون نتيجة بعض الامراض الروماتيزمية والخشونة والاصابات والجراحات.

تصميم الدراسة: دراسة سريرية بأثر رجعي.

الغرض: ابراز دور هذه التواءات العظمية في احداث صعوبات البلع والتنفس والطرق المختلفة للعلاج.

المرضي والطرق: اجريت هذه الدراسة في مستشفى جامعة المنصورة علي تسعة مرضي ستة زكور وثلاثة اناث يعانون جميعا من وجود التواءات العظمية الامامية الكبيرة بالفقرات العنقية المسببة لصعوبات البلع والتنفس . وقد اجريت لهم جميعا اشعة سينية واشعة مقطعية واشعة رنين مغناطيسي علي الفقرات العنقية لتوضيح هذه العظام. كما تم اجراء فحص للبلعوم والمريء بالمنظار . وقد تلقي كل المرضي فرصة بالعلاج التحفظي بمضادات الالتهاب مضادات الارتجاع والكورتيزون واتبعوا نظام غذائي خاص وتم العرض علي متخصصي الروماتيزم والتخاطب.

النتائج: ثلاثة مرضي تحسنوا بالعلاج التحفظي وخمسة مرضي اجريت لهم جراحة لاستئصال التواءات بدون تثبيت الفقرات وقد رفض احد المرضي الجراحة وهو مريض حذر الي الطوارئ باختناق حاد واجريت له جراحة لتركيب شق حنجري ورفض اي اجراء جراحي اخر. العلاج التحفظي والنظام الغذائي يمكن ان يكون حل فعال لنسبة كبيرة من تلك الحالات ولكن التدخل الجراحي يصبح ضروريا للحالات التي لا تستجيب للوسائل التحفظية ويشجع علي ذلك النتائج الجيدة وقللة المضاعفات.

الاستنتاج: علي الرغم من ان التواءات العظمية الامامية الكبيرة للفقرات العنقية تعتبر من الاسباب النادرة لصعوبات البلع والتنفس يجب علينا وضعها في الاعتبار اثناء علاج هؤلاء المرضي وخصوصا كبار السن.