Case Report

Long-term results of surgical treatment of dysphagia secondary to cervical diffuse idiopathic skeletal hyperostosis

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Abstract

BACKGROUND CONTEXT: Large, prominent osteophytes along the anterior aspect of the cervical spine have been reported as a cause of dysphagia. Improvement of swallowing after surgical resection has been reported in a few case reports with short-term follow-up. The current report describes outcomes of a series of five patients with surgical treatment for this rare disorder, with a long-term follow-up.

PURPOSE: To study the clinical and radiographic outcomes of a case series of patients surgically treated for dysphagia secondary to cervical diffuse idiopathic skeletal hyperostosis (DISH).

STUDY DESIGN: Retrospective review of a case series.

PATIENT SAMPLE: Five cases from a University Hospital.

OUTCOME MEASURES: Clinical and imagenological follow-up.

METHODS: The records of five patients with dysphagia who had undergone anterior surgical resection of prominent osteophytes secondary to DISH were reviewed. Extrinsic esophageal compression secondary to anterior cervical osteophytes was radiographically confirmed via preoperative barium esophagogram swallowing study. All patients underwent anterior cervical osteophytes resection without fusion. Postoperatively, patients were followed-up clinically and radiographically with routine lateral cervical radiographs.

RESULTS: Preoperative esophagogram showed that the esophageal obstruction was present at one level in three cases and two levels in two cases. The C3–C4 level was involved in three cases, C4–C5 in three cases, and C5–C6 in one case. There were no postoperative complications, including recurrent laryngeal nerve palsy, wound infection, or hematomas. All patients had resolution of dysphagia soon after surgery (within 2 weeks). Postoperative radiographs demonstrated complete removal of osteophytes. At final follow-up, ranging from 1 to 9 years (average 59.8 months, median 53 months), no patients reported recurrence of dysphagia. Final radiographic examination demonstrated minimal regrowth of the osteophytes.

CONCLUSIONS: Although rarely indicated, surgical resection of anterior cervical osteophytes from DISH causing dysphagia produces good clinical and radiographical outcomes. After thorough evaluation to rule out other intrinsic or extrinsic causes of swallowing difficulty, surgical treatment of this uncommon condition might be considered.

Keywords: Diffuse idiopathic skeletal hyperostosis (DISH); Cervical spondylotic dysphagia; Cervical osteophytes; Surgical treatment

Introduction

Diffuse idiopathic skeletal hyperostosis (DISH), also known as Forestier’s disease, is a noninflammatory enthesopathy of unknown etiology. Affecting predominantly men, it results in flowing, robust ossification of the anterior longitudinal ligament of the spine [1]. In contrast to ankylosing spondylitis, the disc space itself is usually spared, and, by definition, it affects four or more intervertebral levels [1–3].
Notwithstanding postoperative complications, dysphagia, presenting as swallowing difficulty, is an uncommon symptom intrinsically associated with a cervical spine disorder. Despite its rarity, large anterior cervical osteophytes can be a primary cause of swallowing difficulty [4,5]. Osteophytes can develop secondary to degenerative spondylitis or DISH, with the latter usually resulting in larger prominences [6,7].

Dysphagia secondary to anterior cervical osteophytes have been frequently documented, primarily in isolated case reports [4,5,8–26]. Nonoperative management, including diet modification and medications, are the mainstay of treatment [27,28]. However, in those cases in which nonoperative modalities have failed and intrinsic esophageal dysfunction has been ruled out, surgical resection of the osteophytes has been suggested as an effective, albeit last resort, treatment [4,5,27,29–33].

Previous surgical reports have detailed good results in a limited number of cases [4,5,27,29–33], most them on short follow-up. The authors present a case series with the results of surgical excision of anterior cervical osteophytes for dysphagia in a homogenous group of patients with DISH, with a long follow-up.

Material and methods

In a retrospective review of the authors’ operative records at his institution between 1998 and 2008, five patients were identified has having undergone surgical resection of anterior cervical osteophytes for dysphagia with DISH. Institutional review board approval was obtained before conducting this study. The average age of the patients was 71 years (range, 62–79) and all were men.

In each case, the patient had been previously seen by a gastroenterologist and an otolaryngologist (Ears, Nose, and Throat specialist) as part of a comprehensive diagnostic and therapeutic evaluation of dysphagia. Importantly, other causes of dysphagia were ruled out, including intrinsic esophageal dysfunction. Patients underwent diagnostic endoscopy, which did not show evidence of any inner esophageal luminal abnormality, but did demonstrate extrinsic compression in each case. In addition, a barium contrast esophagram was made, which confirmed esophageal compression secondary to anterior cervical osteophytes (Fig. 1). Nonoperative management was attempted in all patients, including diet modification, medication, and other modalities. Patients were then referred to the authors’ spine clinic for possible spine surgical evaluation.

Cervical spine evaluation was performed, including a detailed history, physical examination, and anteroposterior and lateral radiographs (Fig. 2). The diagnosis of DISH was based on inspection of these radiographs, using the following definition: flowing, nonmarginal bridging osteophytes involving four or more levels (Fig. 3). Other diagnoses, such as ankylosing spondylitis, inflammatory arhritides, and degenerative spondylitis were ruled out using these radiographs, among other tests (eg, blood tests, pelvic X-rays). Notably, disc spaces and the sacroiliac joints were spared. Before presentation to the authors’ spine clinic, patients had not been previously diagnosed with DISH.

Preoperative counseling included an in-depth discussion of the potential risks and benefits of surgery with each patient. Upon consenting to surgery, the preoperative esophagogram was used to determine which spinal levels were causing extrinsic luminal compression.

Surgical technique

A standard Smith-Robinson anterior approach to the spine was performed through a longitudinal incision. This longitudinal approach allowed a longer exposure of the cervical spine, avoiding an excessive tension on an already compressed esophagus. The esophagus was gently retracted medially through blunt dissection to prevent any injury. With the anterior aspect of the spine exposed, a marker was placed to identify the operative levels. To help better identify the deformed esophagus, a nasogastric tube was inserted by the anesthesiologist so that it could be palpated during dissection.

Once the correct level(s) were identified, the longus colli muscles were subperiosteally elevated off the anterior spine and retracted laterally. Next, a midline trough was created through the osteophytes using a high-speed burr. Care was taken to differentiate between the relatively avascular osteophytic overgrowth and the more vascular vertebral body. The annulus fibrosis was spared. The lateral aspects of the osteophytes were removed using a Leksell rongeur in piecemeal fashion, while carefully protected the lateral
soft-tissue structures, until flush with the midline trough. Bone bleeding was controlled with the use of bone wax. After final inspection of the esophagus, the wound was closed in layers over a surgical drain.

Postoperative management included mobilization as tolerated on postoperative Day 1 and removal of the drain on postoperative Day 1 as well. A liquid diet was initiated the same day of surgery, and soft diet started on postoperative Day 1. As symptoms resolved, the patients started a regular diet. No cervical collar was used.

Follow-up evaluation

Patients were seen in the clinic after discharge from the hospital at 1 week, 1 month, and yearly after surgery.

Results

Follow-up ranged from 12 to 104 months (nearly 9 years), with an average of 60 months and a median of 53 months. Preoperative esophagogram demonstrated extrinsic luminal compression at one level in three of the patients and two levels in two of the patients. The levels involved were C3–C4 in three cases, C4–C5 in three cases, and C5–C6 in one case.

There were no perioperative or postoperative complications observed. Although in the hospital, patients tolerated a soft puree diet. Complete resolution of dysphagia was reported between 5 and 20 days after surgery, with an average of 10 days, by which time a full, regular diet was well tolerated. This outcome was maintained at latest follow-up.

Immediate postoperative radiographs demonstrated complete removal of the osteophytes at the symptomatic levels as measured by the true anterior vertebral body line (Fig. 4). Radiographs at latest follow-up demonstrated minimal regrowth of the osteophytes (Fig. 5). There were no cases of new onset instability, spondylolisthesis, or deformity.

Discussion

Anterior cervical osteophytes causing dysphagia have been frequently reported in the literature [4,6,9–17,34–39]. However, dysphagia from osteophytic overgrowth from DISH is less common [7,12,34,37,40–45]. In general, most patients can be treated nonoperatively [27–29].
Patients who ultimately elect or require surgical intervention represent the most severe cases, though there are few published series of outcomes [4,5,27,29–33]. Laus et al. [27] published a series of six patients with dysphagia secondary to cervical osteophytes. The three most severe cases underwent surgical treatment that resulted in rapid resolution of symptoms, which was maintained at 1- to 2-year follow-up. Likewise, Goel et al. [29] reported three cases managed by surgical resection of cervical spondylotic osteophytes causing dysphagia, also documenting excellent results at short-term follow-up.

Most reports of surgical treatment have used a standard, Smith-Robinson approach to the anterior cervical spine for osteophytectomy as used by the current authors. Using this technique, Humphreys et al. [6,30] reported good short-term results in three patients in two separately published case reports. Likewise, Yee et al. [33] and Sobol and Rigual [46] published good long-term outcomes of two cases and one case, respectively, with the same approach. Of note, the transoral/transpharyngeal approach has also been used, albeit less frequently, to excise anterior cervical osteophytes [44]. As the relative indications and level of complexity of these two approaches vary considerably, a comparison between them has thus far not been made.

In light of prior reports, the current authors present the outcomes of a larger series of surgical resection of anterior cervical osteophytes causing dysphagia. It carries the additional distinction of being dedicated to a homogenous group of patients with DISH. Though previous reports similarly demonstrated reliable symptom resolution, they included only short-term follow-up. This left in question whether or not, and how quickly, DISH osteophytes can reform and lead to a recurrence of symptoms. In contrast to these previous reports, the current series reported follow-up as long as 8.5 years. This suggests that symptom relief is well maintained over time.

Although the current report may represent the best available evidence, drawing strong conclusions regarding the safety and efficacy of surgical resection of osteophytes causing cervical dysphagia is cautioned. Although the current work, as well as others, reports few or no adverse events, there are a number of complications that can potentially occur and should be discussed with patients preoperatively. As with all retropharyngeal anterior approaches, there is a risk for recurrent laryngeal and superior laryngeal nerve palsies and operatively induced dysphagia, which may be difficult to differentiate from preoperative dysphagia. Although exceedingly rare during elective anterior cervical surgery, the risk of iatrogenic esophageal tear may be higher than usual because of the marked deformity and compression by osteophytes.

Although not used in the current cases, there may be a role for administration of nonsteroidal anti-inflammatory medication to prevent recurrence of osteophyte growth. Indomethacin has been recommended after total hip replacement in patients with heterotopic ossification. Bisphosphonates had, at one time, been considered as prophylaxis after hip replacements in patients with DISH involving the spine, although the necessity of this practice has since been refuted [47,48]. The use of such pharmaceuticals that have the potential to increase bleeding, which might cause a postoperative hematoma, should be carefully considered. Because intervertebral fusion is not an integral part of the described procedure, pseudarthrosis should not be of clinical concern.
References


