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"DISHphagia" - AN UNUSUAL CAUSE OF DYSPHAGIA IN A PATIENT WITH DIFFUSE IDIOPATHIC SKELETAL HYPEROSTOSIS: A CASE REPORT AND LITERATURE REVIEW

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ABSTRACT

Background: Diffuse idiopathic skeletal hyperostosis (DISH) is a non-inflammatory, chronic, systemic disorder characterized by ossification of entheses, primarily affecting the spine. DISH is mostly asymptomatic but can manifest with chronic pain, limitation of spinal mobility, and rarely dysphagia.

Aim: Our aim is to highlight the significance of DISH and its prevalence in the general population, as well as to raise awareness among clinicians of its role in the differential diagnosis of dysphagia, given that few similar cases have been reported and that surgical management is associated with a good prognosis.

Description of the case: A 66-year-old male was admitted to the Department of Neurosurgery with a nine-year history of dysphagia and neck stiffness, which worsened over the preceding two years. CT and MRI scans revealed diffuse calcification of the anterior spinal ligament consistent with a diagnosis of DISH. The patient underwent surgical removal of osteophytes at the C4–C5–C6 levels. Postoperatively, the patient showed no neurological deficits, with only mild intermittent swallowing difficulties that considerably improved.

Conclusions: DISH should be considered in the differential diagnosis of chronic dysphagia in elderly patients, particularly when associated with cervical pain or reduced neck mobility. Surgical removal of osteophytes may provide substantial symptomatic relief in selected patients with severe or progressive symptoms. Increased awareness of this uncommon presentation may facilitate earlier diagnosis and treatment.

KEYWORDS

Diffuse Idiopathic Skeletal Hyperostosis, DISH, Dysphagia, Cervical Osteophytes, Forestier Disease, Case Report, Spine Surgery

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Introduction

This report presents a patient with long-standing dysphagia caused by extensive cervical DISH successfully treated surgically. Additionally, we discuss the current evidence regarding epidemiology, diagnosis, symptomatology, differential diagnosis, and treatment strategies.

Diffuse idiopathic skeletal hyperostosis (DISH) has several synonyms used previously in the literature, including ankylosing hyperostosis, ankylosing spondylosis, spondylosis hyperostotica, senile ankylosing spondylitis, Forestier's disease, and disseminated idiopathic skeletal hyperostosis [5,6]. The entity was first comprehensively described by Forestier and Rotes-Querol in 1950 and is a systemic condition characterized by abnormal ossification patterns, primarily affecting the spine and peripheral entheses [1,2]. This remains the most accurate definition that reflects the systemic nature of the condition and the paucity of knowledge regarding its etiology [4,17]. The disease predominantly affects the spine, especially the thoracic region, where flowing ossifications along the anterior longitudinal ligament are typically observed [3]. Despite being considered a non-inflammatory disorder, DISH may lead to substantial morbidity through mechanical complications and reduced spinal mobility [3].

Epidemiology

The overall prevalence of DISH in the general population is estimated at 11.9% (95% CI, 8.68%–15.59%), increasing from 2.67% in individuals <50 years of age to 19.75% in those ≥80 years [20]. Despite this high frequency, the condition is largely asymptomatic, and most affected individuals remain unaware of their condition; consequently, it has received relatively little clinical attention and remains underdiagnosed [4,6].

Risk factors associated with DISH include advanced age, male sex (with an approximately 2:1 male-to-female ratio), obesity, type 2 diabetes mellitus, metabolic syndrome, hypertension, and hyperinsulinemia [3,8,20].

To assess the frequency of dysphagia described in the literature, we used the following query filtered for case reports and clinical studies, which yielded 332 results in the PubMed database over the past 60 years. Given the common nature of DISH, dysphagia is a rare presentation.

Search query: ((Forestier) OR (disseminated idiopathic skeletal hyperostosis) OR (cervical hyperostosis) OR (osteophyte) OR (osteophytes) OR (spondylophytes) OR (anterior hyperostosis) OR (anterior longitudinal ligament)) AND ((dysphagia) OR (DISHphagia) OR (phagia) OR (deglutition) OR (swallow) OR (swallowing))

Diagnosis

The diagnosis of DISH is based primarily on radiological criteria [3]. The most widely used Resnick and Niwayama criteria, first introduced in 1976, are based on three mainstays:

(a) The presence of "flowing" calcification and ossification along the anterolateral aspects of at least four contiguous vertebral bodies, with or without associated localized pointed excrescences at the intervening vertebral body-disc junctions [3,7].

(b) Relative preservation of disc height in the involved areas and absence of extensive radiographic changes of "degenerative" disc disease, including vacuum phenomena and vertebral body marginal sclerosis [3,7].

(c) Absence of apophyseal joint bony ankylosis and sacroiliac joint erosion, sclerosis, or bony fusion [3,7].

Manifestations

Diffuse idiopathic skeletal hyperostosis (DISH) is predominantly an asymptomatic condition and is frequently diagnosed incidentally on imaging studies performed for unrelated indications [8]. Consequently, many affected individuals remain unaware of the disease, contributing to its underrecognition in clinical practice despite its relatively high prevalence [4,5,20].

When symptoms occur, they are usually related to progressive ossification of spinal ligaments and entheses and include spinal stiffness, chronic axial pain, reduced range of motion, and extraspinal enthesopathies. The thoracic spine is most commonly involved, followed by the lumbar and cervical regions [3,4,9].

Radiographic studies by Resnick and Niwayama demonstrated thoracic involvement in 97% of patients with DISH, lumbar involvement in 93%, and cervical involvement in 78%, emphasizing that cervical disease is common radiologically but often remains clinically silent [3].

Symptomatic cervical involvement may lead to compression of adjacent anatomical structures, resulting in dysphagia, dysphonia, hoarseness, dyspnea, aspiration, sleep apnea, or, in rare cases, acute airway obstruction [6,8,13,16].

Dysphagia secondary to cervical DISH, commonly referred to as "DISHphagia," is an uncommon but clinically important manifestation. Population-based studies estimate that only approximately 0.1–6% of patients with cervical DISH develop clinically significant dysphagia, although higher frequencies have been reported in surgical and referral cohorts due to selection bias [8,19,21].

The pathophysiology of dysphagia is multifactorial. The principal mechanism is direct mechanical compression of the pharynx or esophagus by large anterior cervical osteophytes. Additional contributing factors include local inflammatory edema, fibrosis, impaired epiglottic inversion, restriction of laryngeal elevation, recurrent laryngeal nerve irritation, and cricopharyngeal spasm, all of which may impair the normal swallowing process [6,13,16,19].

Osteophytes located at the C3–C5 levels are particularly likely to produce swallowing disturbances because they interfere with epiglottic movement during deglutition. A systematic review by Verlaan et al. demonstrated that the C4 and C5 vertebrae are the most frequently affected cervical levels in patients presenting with dysphagia and/or airway obstruction [6,13].

Because dysphagia usually progresses gradually from difficulty swallowing solid foods to impairment of semisolid and liquid intake, affected patients may develop malnutrition, weight loss, dehydration, recurrent aspiration, and a marked reduction in quality of life if diagnosis and treatment are delayed [6,8,14,21].

The mean duration of symptoms before diagnosis was approximately 500 days, illustrating the frequently delayed recognition of this condition [6].

Differential Diagnosis

The differential diagnosis of DISH primarily includes ankylosing spondylitis (AS), degenerative spondylosis, and other causes of chronic dysphagia, including esophageal malignancy, motility disorders, neurological diseases, Zenker diverticulum, and cervical tumors [3,4,14,15,26].

Table 1. Differential diagnosis of DISH, ankylosing spondylitis, and osteoarthritis of the vertebral column

	Diffuse Idiopathic Skeletal Hyperostosis (DISH)	Ankylosing Spondylitis (AS)	Osteoarthritis of vertebral column (Spondylosis)
Age & Gender	Predominantly male >50 years (M:F ≈ 2:1). Prevalence peaks at 19.75% in ≥80 years.	Onset typically <40 years (M:F ≈ 3:1). usually starts in the lower back and SIJ then progresses to the entire spine	Progressive with age; M:F ≈ 1:1.; lumbar ~50-76% (age ≥60, radiographic, KL-graded); cervical symptomatic prevalence, general population ~13-14%; disc degeneration prevalence over the entire spine ≈ 90% > 50
Symptoms	Mainly asymptomatic, symptoms correlated with radiographic severity	Causes considerable signs and symptoms	High structural prevalence without a consistent pain association
Vertebral bodies	"Flowing" ossification and hyperostosis; large, coarse, vertical, and bridging osteophytes; minimal degenerative disc disease, facet arthropathy, absent facet ankylosis; thoracic spine (100%) > cervical (65-80%); lumbar spine (68-90%); ankylosis frequent radiographically, less frequent pathologically	Thin syndesmophytes; osteitis with "squaring"; extensive bony ankylosis radiographically and pathologically; slender, vertically oriented bony bridges connecting adjacent vertebral bodies	Sclerosis of superior and inferior surfaces; osteophytes are usually transverse; Lumbar > Cervical >> Thoracic, with lumbar and cervical together representing ~80% of clinically presenting degenerative spinal disease
Intervertebral discs	Normal or mild decrease in height	Normal or convex in shape	Moderate to severe decrease in height; "vacuum" phenomena
Apophyseal joints	Normal or mild sclerosis; occasional osteophytes	Erosions, sclerosis, and bony ankylosis	Normal
Sacroiliac joints	Para-articular osteophytes	Erosions, sclerosis, and bony ankylosis	Normal

Treatment

Management depends on symptom severity and the degree of mechanical compression. Conservative treatment is recommended as first-line therapy in patients with mild or moderate symptoms [1,18,21,24,27].

Conservative measures include dietary modification, swallowing rehabilitation, postural techniques during swallowing, non-steroidal anti-inflammatory drugs, muscle relaxants, corticosteroids when appropriate, and antireflux therapy. These interventions may alleviate symptoms but often provide only temporary relief in patients with significant osteophyte-related compression [8,14,18,21,24].

Surgical osteophytectomy is indicated in patients with progressive dysphagia, weight loss, airway compromise, recurrent aspiration, or failure of adequate conservative treatment [7,8,21,24].

Anterior cervical osteophytectomy has consistently demonstrated favorable outcomes, with most patients experiencing marked improvement or complete resolution of swallowing symptoms. In the series reported by Carlson et al., eight of nine patients resumed an unrestricted diet following surgery [8].

Spinal fusion remains controversial. While some authors advocate concomitant fusion to reduce recurrence or postoperative instability, others report excellent outcomes following isolated osteophytectomy when spinal stability is preserved, as in the present case [6,7,24].

Prognosis

The prognosis following surgical treatment is generally favorable, with most patients experiencing rapid improvement in swallowing function and quality of life [7,8,24].

Despite excellent short-term outcomes, recurrence of anterior cervical osteophytes may occur because DISH is a progressive systemic ossification disorder [6,7].

In a long-term follow-up study by Miyamoto et al., recurrent osteophyte formation occurred at a mean rate of approximately 1 mm per year. Radiographic recurrence was observed in seven patients, although five remained asymptomatic, while only two developed recurrent dysphagia after more than 10 years of follow-up [7].

Similarly, Verlaan et al. reported recurrence requiring repeat osteophyctomy in two patients and gastrostomy in one patient, although symptomatic recurrence remained uncommon overall [6].

These findings suggest that long-term clinical and radiological follow-up is advisable, particularly in younger patients or those with persistent metabolic risk factors for progressive ossification [6,7].

Case Presentation

A 66-year-old male with a history of chronic obstructive pulmonary disease, benign prostatic hyperplasia, and chronic superficial gastritis was admitted to the Department of Neurosurgery due to progressive dysphagia and cervical stiffness. Symptoms had persisted for approximately nine years and had significantly worsened over the previous two years. Initially, the patient experienced difficulty swallowing solid food, which gradually progressed to intermittent impairment with semisolid meals. He additionally reported chronic neck stiffness, mild cervical pain especially during extension movements, and weight loss of approximately 25 kg over the preceding two years due to difficulty swallowing.

The patient had no prior history of trauma, malignancy, neurological symptoms, or previous cervical surgery. His medical history was otherwise unremarkable, with no diagnosed rheumatologic or neuromuscular disease.

Physical examination revealed reduced cervical spine mobility, predominantly in extension and rotation. No focal neurological deficits were observed. Cranial nerve examination was normal, and there were no signs of upper motor neuron involvement.

Laboratory investigations showed no evidence of systemic inflammation or infection. Routine hematological and biochemical parameters were within normal limits.

Computed tomography (CT) of the cervical spine demonstrated extensive ossification of the anterior longitudinal ligament with bridging osteophytes extending from C2 to C6, with the most prominent bone outgrowths causing a mass effect on adjacent soft tissues on the posterior wall of the pharynx and esophagus at C4–C6. Intervertebral disc spaces were relatively preserved.

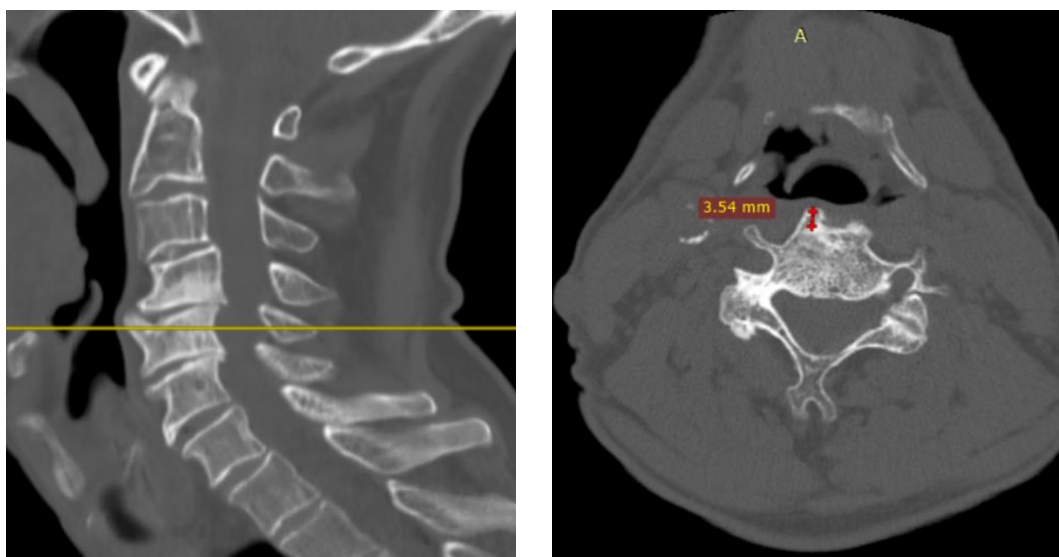


Fig. 1. Preoperative computed tomography demonstrating extensive anterior cervical osteophytes at the C4–C6 levels.

Magnetic resonance imaging (MRI) confirmed the presence of extensive anterior cervical ossification without significant spinal cord compression or intramedullary signal abnormalities.



Fig. 2. *Sagittal magnetic resonance imaging showing ossification of the anterior longitudinal ligament without significant spinal cord compression.*

Based on the clinical presentation and imaging findings, the patient was diagnosed with diffuse idiopathic skeletal hyperostosis involving the cervical spine.

Given the severity and progression of dysphagia, surgical treatment was recommended. The patient underwent anterior cervical osteophyctomy through a standard left-sided anterolateral cervical approach. Osteophytes at the C4–C5–C6 levels were removed without discectomy or spinal instrumentation because spinal stability was preserved intraoperatively.

The postoperative course was uneventful. No neurological deficits, wound complications, or respiratory impairment occurred. Oral intake was gradually reintroduced. The patient reported significant improvement in swallowing function and reduction of neck discomfort. At follow-up, the patient presented with nearly total remission of presenting symptoms.



Fig. 3. Postoperative imaging demonstrating successful decompression of the anterior cervical region.

Discussion

Dysphagia is a relatively uncommon but clinically significant manifestation of cervical DISH [6,12]. While cervical osteophytes are frequently identified radiologically in elderly populations, only a minority of patients develop symptomatic swallowing impairment [6]. The pathophysiology of dysphagia in DISH remains multifactorial [6,12].

Mechanical compression of the esophagus by anterior cervical osteophytes is considered the principal mechanism [12]. However, local inflammation, fibrosis, recurrent laryngeal nerve irritation, impaired laryngeal elevation, and cricopharyngeal spasm may also contribute [6,12]. Osteophytes located at the C3–C5 levels are particularly likely to produce dysphagia because they interfere with epiglottis inversion and normal swallowing biomechanics [12].

The differential diagnosis of chronic dysphagia is broad and includes esophageal tumors, motility disorders, neurological diseases, Zenker diverticulum, cervical malignancies, and degenerative spinal disorders [14]. Consequently, diagnosis may be delayed, especially in patients without known rheumatologic disease [5]. In the present case, symptoms persisted for nearly a decade before definitive surgical management was undertaken.

Imaging studies play a central role in diagnosis [3,11]. Plain radiographs may demonstrate characteristic flowing anterior ossifications; however, CT provides superior visualization of osteophyte morphology and degree of esophageal compression [5]. MRI is particularly useful for assessing spinal canal compromise, soft tissue inflammation, and exclusion of alternative pathologies [5].

Conservative treatment is generally recommended initially in patients with mild symptoms [5,14]. Management may include dietary modification, anti-inflammatory medication, muscle relaxants, proton pump inhibitors, swallowing rehabilitation, and postural therapy [5,14]. Nevertheless, conservative treatment often provides only temporary benefit in patients with severe mechanical compression [5].

Surgical osteophytectomy remains the treatment of choice in patients with progressive dysphagia, airway compromise, weight loss, or failure of conservative management [5,7]. Multiple studies have demonstrated significant postoperative improvement in swallowing function in most patients [5,7]. Some authors advocate concomitant spinal fusion to reduce the risk of recurrence and instability, whereas others report satisfactory outcomes following isolated osteophytectomy [6,7].

In the present case, surgical removal of anterior osteophytes resulted in marked clinical improvement without the need for fusion. Preservation of disc integrity and spinal stability allowed avoidance of instrumentation-related complications.

Recurrence following surgery has been described in the literature and may occur years after intervention due to continued ossification processes [6]. Long-term clinical and radiological follow-up is therefore advisable [6].

From an evidence-based medicine perspective, available literature on dysphagia secondary to DISH consists predominantly of case reports, retrospective cohorts, and narrative reviews [3,5]. Despite the low level of evidence, consistent findings across published studies support surgical intervention in carefully selected symptomatic patients [5,7]. Verlaan et al. reported substantial symptomatic improvement in the majority of surgically treated patients with cervical DISH-associated dysphagia [5]. Similarly, Miyamoto et al. demonstrated durable postoperative relief, although osteophyte regrowth was observed during long-term follow-up [6].

The present report contributes additional evidence supporting surgical decompression as an effective treatment strategy in selected patients with severe "DISHphagia." Increased awareness among neurologists, otolaryngologists, gastroenterologists, and spine surgeons may facilitate earlier diagnosis and management.

Cervical anterior osteophytes accompanying DISH are most frequently asymptomatic. Large osteophytes, however, do cause swallowing disorders through a variety of mechanisms, including: (1) direct mechanical compression of the pharynx and esophagus [9], (2) disturbances of normal epiglottis tilt over the laryngeal inlet by osteophytes at the C3–C4 level [5,14], (3) inflammatory reactions in the tissues around the esophagus [1,16], and (4) cricopharyngeal spasm [2].

While five out of seven patients with radiological recurrence remained asymptomatic, two of seven who were followed for more than 10 years complained of recurrent dysphagia. The five asymptomatic patients require longer-term follow-up to provide conclusive evidence of the presence or absence of symptomatic recurrence. The mean postoperative increase in size of the largest recurrent osteophyte in each patient was approximately 1 mm/year [7].

Because DISH is a largely asymptomatic condition, with most affected individuals unaware of its presence, it has not received much attention from clinicians and researchers and still remains underdiagnosed despite its high prevalence [4,6]. This highlights the importance of bringing this entity to common knowledge.

Conclusions

Diffuse idiopathic skeletal hyperostosis should be considered in elderly patients presenting with chronic dysphagia accompanied by cervical pain or restricted neck mobility [5,12]. Because symptoms are often non-specific and slowly progressive, diagnosis may be delayed for years [5].

Radiological evaluation is essential for diagnosis, with CT imaging offering excellent visualization of anterior cervical osteophytes [5]. Although conservative therapy may be effective in mild cases, surgical osteophytectomy can provide substantial symptomatic improvement in patients with severe or progressive dysphagia [5,7].

Early recognition of cervical DISH may improve patient quality of life and prevent prolonged diagnostic uncertainty.

Disclosure:

The authors declare that this manuscript is original, has not been published previously, and is not under consideration for publication elsewhere. All authors have reviewed and approved the final version of the manuscript and agree to its submission to the Journal of Education, Health and Sport.

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