A patient with midthoracic back pain and dysphagia: a case report

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This case study reports on complaints of midthoracic back pain and dysphagia in a patient with significant osteophytes in the context of Diffuse Idiopathic Skeletal Hyperostosis (DISH). The clinical and radiologic phenomena of DISH are discussed. Despite the presence of important structural radiologic abnormalities in the thoracic spine in our patient, there was a good clinical recovery after exercise and manual therapy aimed at improvement of posture, functional scapulothoracic stability, strength of the interscapular muscles, length of the pectoral muscles, and mobility of the cervicothoracic and upper thoracic spine. We suggest that functional factors rather than structural abnormalities played a causal role in the genesis of midthoracic back pain in our patient.

Key words: ■ Diffuse Idiopathic Skeletal Hyperostosis ■ back pain ■ dysphagia

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We frequently see patients with midthoracic back pain in our outpatient clinic. Often these complaints are caused by insufficiency of interscapular musculature, insufficient scapulothoracic stability, and a poor posture, sometimes in combination with Scheuermann's disease. Most patients with thoracic kyphosis-related back pain recover after exercise therapy directed at improvement of posture, relief of lower extremity contractures, and strengthening of abdominal musculature (Pizzutillo, 2004). Recently, we saw a 46-year old woman with midthoracic back pain in combination with dysphagia, referred by the gastroenterologist. Upper endoscopy revealed no disorders of the oesophagus and stomach, but on an X-ray of the thoracic spine osteophytes were imaged on the ventral side of the midthoracic vertebrae. These radiologic findings seemed to fit the diagnosis Diffuse Idiopathic Skeletal Hyperostosis (DISH) (Forestier and Rotes-Querol, 1950; Mader, 2003). The gastroenterologist advised symptomatic relief of pain with analgesics and amitriptyline. In this case report we will discuss the place of exercise therapy and manual therapy in DISH.

CASE DESCRIPTION

The patient is an otherwise healthy 46-year old woman, working at the desk of the post office. She consulted a gastroenterologist with complaints of dysphagia and midthoracic back pain. The patient's complaints started two years earlier, after a period of intentional weight loss of 32 kg. Since then, she reported gradually progressive symptoms of interscapular back pain in combination with dysphagia. Shortly after swallowing, she felt food passing through the oesophagus. This provoked pain in the midthoracic part of her back, without radiation to the lower back or the arms. The midthoracic back pain also occurred during her work at the post office, where she sat at the desk. During the course of the day her pain became worse such that she was not able to work fulltime anymore. During the night she often woke up with pain in her thoracic spine. It should be noted that during her pubertal growth spurt she did not have midthoracic back pain. Complaints of low back pain or pain in the peripheral joints were absent. Global Disability Rating Index—measured with visual analogue scales, ranging from 0 (no pain or problem) to 100 (maximum pain or problem)—was 44; the score on items concerning daily physical activities was 76 (Salen et al, 1994).

Clinical examination revealed a poor posture with a markedly increased thoracic and thoracolumbar kyphosis, together with protraction of the shoulders, tight pectoral muscles and slight anteroposition of the head (*Figure 1*). Examination of the cervicothoracic junction showed limited passive rotation of the segments C7-Th3 and limitation of abduction-elevation

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Figure 1. Posture before start of exercise therapy

of both arms. Rotations of the thoracic spine were limited especially in the segments Th8–11. Palpation of and posteroanterior compression on the thoracic spine in prone position was most painful at segments Th4–5 and Th5–6, especially at the right side of the costotransverse joints. Mobility of both glenohumeral joints was not impaired. Upper limb tension tests and slump test were carried out and did not provoke pain, ruling out neurological impairment in the patient.

X-ray examination of the thoracic spine

Figure 2. X-thoracic spine: osteophyte formation of the thoracic spine, with a giant osteophyte at the level of Th8–9

revealed a giant thoracic osteophyte localized at the anterior side of the spine at the level of Th8–9, extending 17 mm anteriorly from the intervertebral junction (*Figure 2*). This finding was confirmed by a CAT-scan of the thoracic spine (*Figure 3*). On the adjacent segments between Th5 and Th11, additional osteophytes were visible on the ventral side of the intervertebral junctions, although less profound. The vertebral corpora of the thoracic spine were normal and there were no signs of apophyseal joint ankylosis. Intervertebral disk heights were also normal.

The gastroenterologist prescribed amitriptyline 25 mg ante noctem, which resulted in a slight relief of pain in the thoracic spine during the night, but did not diminish her complaints during the course of the day. Based on the reported increasing pain during sitting work in combination with our findings at clinical examination, we proposed to start her on an exercise programme. We explained to her that physiotherapy would not solve the structural abnormalities in her back. But improving posture and load might have a beneficial effect on the pain. She agreed with our proposal and she started with an exercise programme aimed at improvement of her pos-

ture, functional scapulothoracic stability, strength of the interscapular muscles, and length of the pectoral muscles. She came twice a week to the clinic for mobilization of the cervicothoracic and upper thoracic spine. Because of the multilevel structural defects on the ventral side of the thoracic spine, we did not perform high velocity manipulation techniques of the thoracic spine, but we chose to use guided active mobilization techniques of the thoracic and cervicothoracic segments. This approach was combined with passive mobilizations of the thoracic costotransversal junctions. After each mobilization session, the clinical examination was repeated and after four sessions cervicothoracic and thoracic rotations were improved. After six treatment sessions, the patient reported a marked decrease in the nocturnal pain and she was less frequently waking from pain. She was subsequently encouraged to continue her exercise programme at home with the aim of improving her posture by muscular endurance training of interscapular and scapulothoracic stabilizing muscles in combination with stretching of the pectoral muscles. Two months after the start of therapy, a repeat clinical examination revealed marked improvement of her posture and of the strength of the lower part of the trapezoid, anterior serrated, and rhomboid muscles (*Figure 4*). She noticed that she was able to carry on better during her working day. She still could feel the food passing through the oesophagus, but swallowing was not coupled with thoracic pain anymore. In consultation with her medical officer, she gradually expanded her working hours. Three months after starting exercise therapy, she was able to resume her work fulltime again, and she was satisfied with her situation. A repeated Disability Rating Index showed improvement from 44 to 23 (all questions) and from 76 to 36 on the questions concerning daily physical activities.

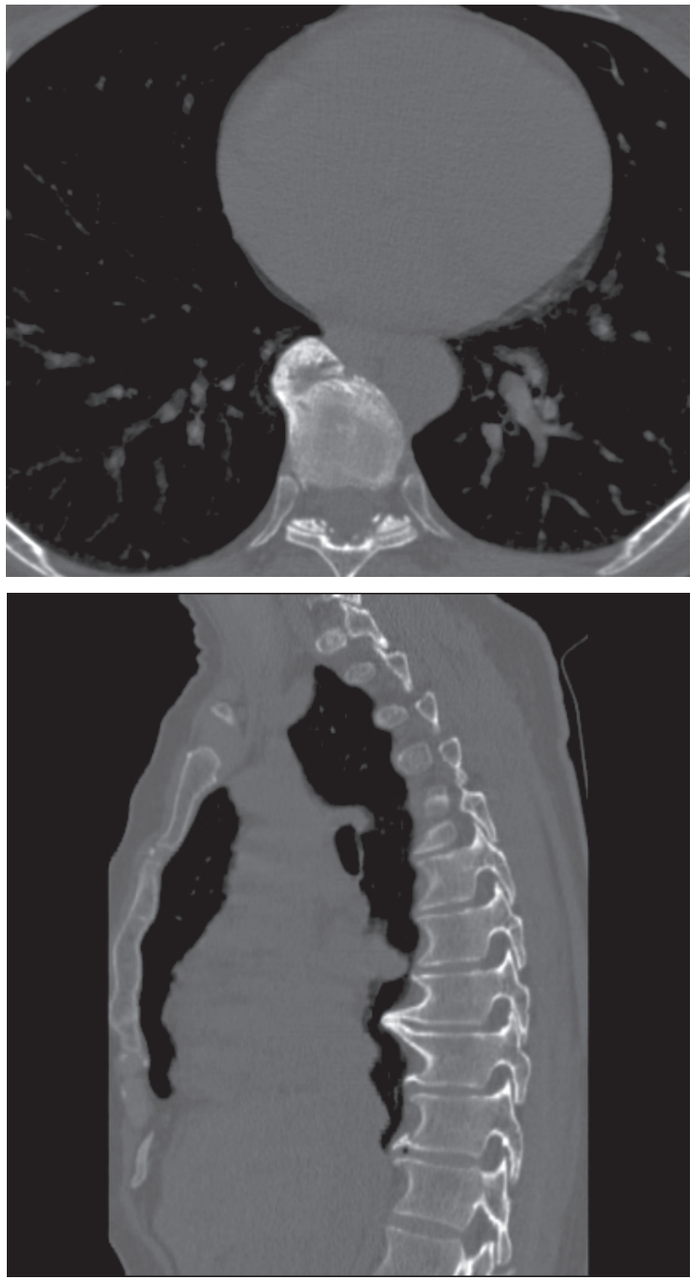

Figure 3. CAT-scan of the osteophyte at the level of Th8/9
Panel 3a (top). transversal plane
Panel 3b (bottom). saggital plane

DISCUSSION

This patient with radiologic signs suggesting DISH, had complaints of dysphagia and midthoracic pain. Reports in the literature on the combination of ventral thoracic osteophytes and dysphagia are scarce (Resnick and Niwayama, 1976; Willing et al, 1983; Cai et al, 2003). DISH is defined by calcification and ossification of soft tissues, ligaments, and tendon insertions. Forestier and Rotes-Querol originally described it as senile ankylosing hyperostosis in 1950 (Forestier and Rotes-Querol, 1950). Resnick and Niwayama changed the name of this diagnosis to Diffuse Idiopathic Skeletal Hyperostosis (DISH) because, as well as the spine, the peripheral joints can be involved (Resnick and Niwayama, 1976). Validated clinical criteria to make this diagnosis are currently lacking. Radiographic criteria for DISH are right-sided, flowing, coarse osteophytes of the thoracic spine, connecting at least four contiguous vertebrae, or ossification of the anterior longitudinal ligament. Intervertebral disk height in the involved segment must be preserved, and signs of apophyseal joint ankylosis and sacroiliac

Figure 4. Posture two months after the start of exercise therapy

joint involvement must be absent (Resnick and Niwayama, 1988). With these radiologic criteria, DISH can be seen as a separate clinical entity, which has to be distinguished from inflammatory spondylarthropathies and osteoarthritis. In contrast to osteoarthritis, DISH affects more males than females (Mader, 2003). Prevalence of DISH differs in literature and varies from 10–35% in patients over 70 years of age. DISH is more frequently seen in younger patients than osteoarthritis, which suggests a different pathophysiologic mechanism than osteoarthritis (Mader, 2003). Osteoarthritis is primarily a problem of cartilage, while in DISH there is thickening and calcification of ligaments and tendon insertions. The exact pathophysiologic mechanism of DISH is not clear. However, DISH is associated with various metabolic conditions like hyperinsulinemia, obesity, gout, dyslipidemia, and prolonged use of isoretinol (Mader, 2003). In this case report, obesity could have played a role in the development of the disease, given that the symptoms started after a period of substantial weight loss.

DISH is often asymptomatic and accidentally found on a chest X-ray. If symptomatic, a conservative treatment suffices to relieve symptoms in most cases. Surgical removal of osteophytes is seldom necessary (Underberg-Davis and Levine, 1991). In this case, the complaints of dysphagia can plausibly be attributed to the mechanical compression of the oesophagus by the thoracic osteophyte. The question is, however, whether there is a causal relationship between the patient's thoracic pain and the radiologic impediments. The fact that the most severe pain was provoked by posterioranterior compression of the thoracic segments proximal of the osteophytes makes this less likely. In addition, good clinical response to exercise therapy is also suggestive of a more functional cause of the thoracic pain. According to the model proposed by Gifford and Butler in 1997 and developed by Gifford in 1998, pain dynamics are influenced by different factors (Gifford and Butler, 1997; Gifford, 1998). Chronic pain syndromes can be explained not only as caused by tissue damage, but as a result of peripheral and central sensitization and altered information processing in the body. Furthermore, postural abnormalities in the thoracic region are common and are associated with a higher incidence of interscapular pain (Griegel-Morris et al, 1992). We feel that the patient's poor posture combined with weakness of the interscapular muscles and shortening of the pectoral muscles played a crucial role in the genesis of the pain, rather than the structural abnormality of DISH. Given the long duration of the symptoms in this patient, processes of peripheral and central sensitization could also have played a role in pain perception.

CONCLUSION

In conclusion, we reported on a patient with complaints of thoracic pain and an abnormal radiologic appearance of the thoracic spine. Although it is tempting to attribute symptoms to structural abnormalities, it is important to keep an eye open for functional causes of pain and impairments that can be treated by conservative exercise and manual therapy. IJTR

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COMMENTARIES

From a practitioner's perspective, a proper evaluation to exclude those clinical entities that would contraindicate our proposed interventions is one of the most important aspects of the pre-treatment stage of patient care (Troyanovich, 2001). In regards to diffuse idiopathic skeletal hyperostosis (DISH), the authors of this case report have done an adequate job of describing the patient's history, imaging findings and aspects of their physical examination findings.

Having also stated the importance of the neurologic examination, one may look to the methods reported to assist the patient in the management of her presenting complaints.

Exercise and manual therapy are commonly employed modalities in the treatment of a wide variety of musculoskeletal pain syndromes. There is no shortage of scientific evidence that these methods can be effective in the management of spinal pain and dysfunction (Bigos et al, 1994; Van Middelkoop et al, 2010).

In this case the exercise and manual therapy appear to be instrumental in helping the patient regain function, reduce pain and return to her activities of daily living. The authors speculate as to the mechanisms that may have been involved in this clinical success. Unfortunately, there is no way that we may be certain that the treatment or the proposed mechanisms of action were the cause of this patient's improvement.

There are multiple reasons why patients' symptoms improve. Such reasons may include the natural history of the condition, regression to their mean level of pain, the specific effects of the treatment, or non-specific effects of treatment attributable to factors other than the specific active components (Brody, 1985; Waddell, 1987; Whitney and Von Korff, 1992). In addition, this patient received pharmacologic therapy, and this drug therapy may have had some synergistic effect on her recovery.

In the absence of randomized controlled trials, it is important for clinicians to share their clinical experience with each other as an elemental step toward advancing knowledge and patient care. However, it

> "...there is no way that we may be certain that the treatment or the proposed mechanisms of action were the cause of this patient's improvement"

is important to place our empirical clinical experience in the proper perspective so as not to overstate the significance of an individual case report. Or, as Dr. Buettner and I stated in our case report of a patient treated with exercise, traction, and manual therapy for complaints presumed to be secondary to DISH,

> **"The obvious shortcoming of this case report is that it is a case study of *n*=1. No decisive conclusions may be reached with regard to the methods used regarding the condition of DISH . . . The relative paucity of information on this subject should further serve to encourage the chiropractic community to at least report on empirical experience in managing patients with named pathologic conditions." (Troyanovich and Buettner, 2003)**

The authors should be commended on reporting on their empirical experience in this named pathological condition.

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There is debate as to whether or not diffuse idiopathic skeletal hyperostosis (DISH) is a cause of back pain. Individual physicians are challenged with assessing whether or not the distinct, and often striking, radiographic abnormality of spinal DISH is associated with back pain complaints.

This study

The authors have presented a case study of a middle aged woman with poor posture who presents with thoracic back pain and dysphagia, who also has radiographic evidence of a large anterior thoracic osteophyte. Exercise therapy, aimed at stretching the pectoral muscles and strengthening the interscapular muscles, as well as manual therapy, aimed at mobilizing the thoracic and cervicothoracic regions, were used as treatment. The authors report improvement in thoracic back pain after rehabilitation. This suggests that postural abnormalities may have been contributing to the back pain.

The osteophyte discussed in this case study is consistent with early-stage DISH. There are various clinical presentations of DISH, one of which is classified by anterior flowing ossification connecting ≥4 vertebrae. Once the ossification connects multiple vertebrae, stiffness increases and mobility decreases; although, those with vertebral fusion due to DISH do not report more back pain than those without (Schlapbach et al, 1989; Holton et al, 2011) It is possible that back pain occurs more frequently in those with early stage DISH, before fusion occurs.

It has been well documented in case studies that cervical DISH can lead to dysphagia. Though once believed to be a rare occurrence, it has recently been noted that dysphagia secondary to cervical DISH is actually more common than once believed. (Verlaan et al, 2011) Thoracic DISH can also lead to dysphagia. In the case study, the oesophagus appears to be surrounded by the heart, aorta, and osteophyte, which could be limiting the expansion of the oesophagus and interfering with the passage of food. Postural abnormalities also may have been exacerbating this pressure on the oesophagus.

> “Patients with DISH may be more likely to benefit from exercise intervention early on in the disease process, before multiple vertebral levels have been fused from the flowing ossification”

Conclusions

This case study suggests the importance of postural assessment and that exercise therapy may be effective in the treatment of thoracic back pain. Decreasing kyphosis may increase mobility and decrease anterior loading of the spine. Patients with DISH may be more likely to benefit from exercise intervention early on in the disease process, before multiple vertebral levels have been fused from the flowing ossification. This case study is also a reminder to clinicians on the importance of searching out alternative explanations for back pain in patients presenting with spinal DISH.

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