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CALCIFIED THORACIC SYNOVIAL CYST CAUSING MYELOPATHY: A CASE REPORT

MİYELOPATİYE NEDEN OLAN TORAKAL KALSİFİYE SİNOVİYAL KİST: OLGU SUNUMU

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SUMMARY

Synovial cysts are covered with epithelium and cause degenerated facet joints. They may cause radiculopathy through nerve root compression, or they may enlarge towards the vertebral canal, causing myelopathy. The lumbar spine is the most commonly affected site, and the cervical spine is the next most common location. Thoracic synovial cysts, particularly calcified ones causing myelopathy, have been rarely reported. In this manuscript, we report the surgical management of a calcified thoracic synovial cyst that caused myelopathy in a 58-year-old woman. The importance of diagnosis and surgical management of this rare entity is discussed. Thoracic cord compression should be considered in the differential diagnosis of synovial cysts. Surgical treatment should be considered as the initial treatment modality, especially in patients with neurological signs, and is associated with a favorable outcome.

Key words: calcification, myelopathy, synovial cyst, surgical treatment, thoracic spine

Level of evidence: Case report, Level IV

ÖZET

Sinoviyal kistler dejenere olmuş faset eklemlerden kaynaklanan epitel doku ile kaplı oluşumlardır. Spinal kök basısına bağlı radikülopatiye yol açtıkları gibi vertebral kanala doğru büyüyerek miyelopatiye de neden olabilirler. Lomber omurga en sık etkilenen bölgedir ve servikal bölge de en sık kaynaklandıkları ikinci yerdir. Torakal sinovial kistlere ve özellikle miyelopatiye yol açmış kalsifiye olanlarına çok nadiren rastlanır. Bu yazıda 58 yaşında bir kadın hastada myelopatiye neden olmuş bir torakal kalsifiye sinoviyal kistin cerrahi tedavisi sunulmaktadır. Bu nadir lezyonun teşhis ve cerrahi tedavisinin önemi tartışılmaktadır. Sinovial kistlerin torakal omurilik basısı ayırıcı tanısında akılda tutulmalıdır. Özellikle nörolojik bulgu ile başvuran hastalarda cerrahi tedavi iyi klinik sonuçlarla beraberdir ve ilk planda düşünülmelidir.

Anahtar Kelimeler: cerrahi tedavi, kalsifikasyon, miyelopati, sinoviyal kist, torakal omurga

Kanıt Düzeyi: Olgu Sunumu, Düzey IV

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INTRODUCTION

Synovial cysts (SCs) are covered with epithelium, and form on the facet joints in the spine, enlarging towards the postero-lateral part of the spinal cord canal[6,8,11]. They usually occur between the fifth and sixth decades of life, and incidence is not dependent on gender[6,11]. They are commonly seen at the L4–5 levels of the spine, and in the lumbar and cervical regions[8]. Thoracic SCs, particularly calcified ones, are rarely seen[1,3,5]. In this article, the diagnosis and surgical management of a rare SC causing myelopathy in the thoracic region will be discussed. This study shows that this rare pathology should be considered in the differential diagnosis of patients admitted due to myelopathy, and emphasizes the importance of surgery in the treatment.

CASE PRESENTATION

A woman aged 57 was admitted due to leg pain and strength loss, lethargy, gait disorder and urinary incontinence, which started acutely two weeks previously and had begun to increase. In her neurological examination, global hypoesthesia in both lower extremities, paresis with 3/5 motor force, and upper motor neuron signs accompanied by increased reflexes were detected. In the medical history of the patient, she had received surgery with laminectomy at the L4–S1 level and posterior spinal fusion eight years previously, and C6 corpectomy and anterior cervical fusion six years previously. In CT and myelography of the whole spine, a large central disc-osteophyte complex causing midlevel spinal stenosis was detected at the T5–6 level, and a lesion causing advanced spinal stenosis on the right facet was detected at the T9–10 level. At this level, signal changes compatible with myelopathy in the spinal cord were present in MRI (Figure-1.a-e).

In a thorax CT of the patient taken ten years previously, taken from the radiology database at the hospital, it was observed that the lesion at the T9–10 level was smaller and did not cause any symptoms (Figure-1.f).

With these clinical and radiological signs, it was decided to apply decompressive surgical treatment to both levels.

Before operation, sign nails were placed between the right transverse projections of the T5 and T9 vertebrae and laminae under CT. The operation was performed under neuromonitorization using excited motor (MEP) and somatosensory (SSEP) potentials.

In a prone position, after a midline incision between T4–12, pedicle screws were placed at the T4–12 levels after the paravertebral muscles were moved away,

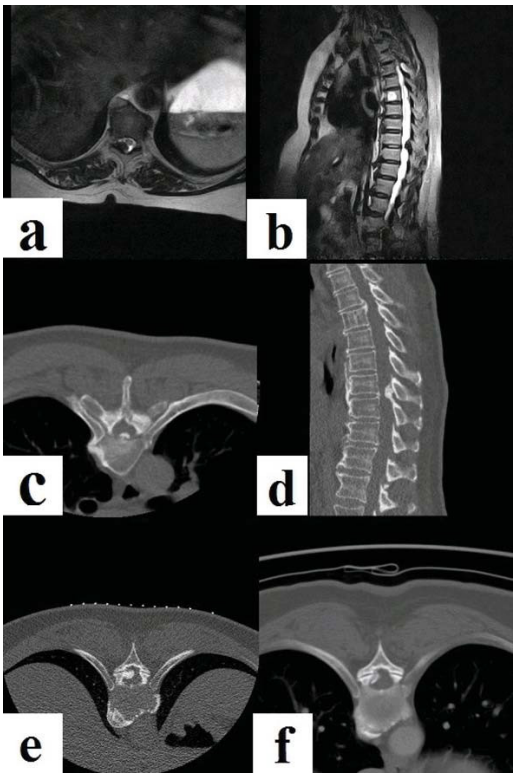

Figure-1. a. and **b.** Axial and sagittal MRI sections showing the lesion on the right facet, causing advanced spinal stenosis at the T9–10 level; **c.** Axial thoracic spine CT showing central disc-osteophyte complex causing midlevel spinal stenosis at the T5–6 level; **d.** Sagittal and **e.** Axial CT sections of the calcified synovial cyst at T9–10 level; **f.** In a thorax CT taken ten years previously, it seems that the lesion at T9–10 was smaller.

and the screw positions were controlled by fluoroscopy. First the T5–6 and then the T9–10 levels were decompressed with a high speed TUR and thin Kerrison rongeur. The left lamina was thinned with TUR, because the large calcified cyst was on the right at the T9–10 level, and hemilaminectomy was performed with the use of a thin Kerrison rongeur. Then the right facet and lamina were thinned by drilling. The calcified lesion was lifted towards the right lateral as a cover with a thin hook, broken, and removed. The spinal cord was adequately relaxed. Dural rupture of about 0.5 cm occurred during dissection because the calcified cyst had indented the dura, and this defect was primarily sutured. Then, rods suitable for thoracic kyphosis were placed and the system was stabilized. The posterior elements were decorticated and the operation was ended after posterior arthrodesis. In postoperative CT and direct X-rays, the distances were sufficiently decompressed and no problems in the instrument system were detected (Figure-2 a-c).

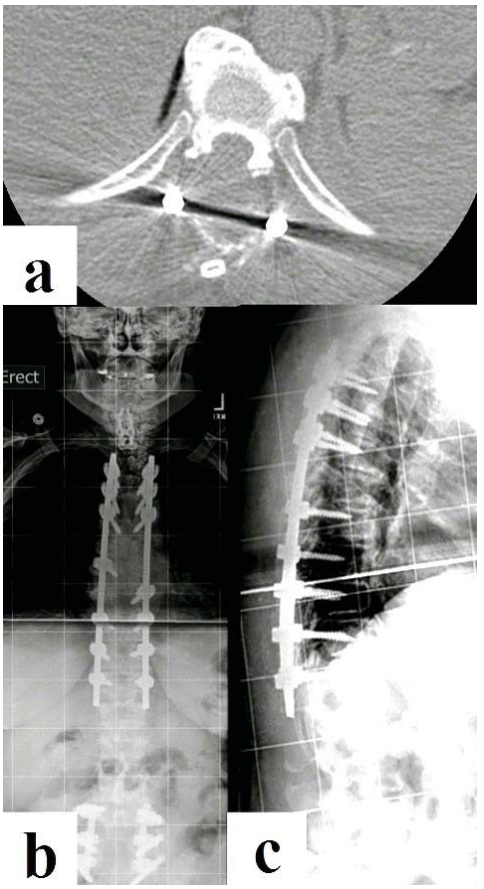

Figure-2. In postoperative **a.** axial CT sections, complete removal of the lesion and decompressed spinal cord is seen; in postoperative **b.** AP and **c.** Lateral direct X-rays, the thoracolumbar spine kypholordosis is natural and the coronal balance is normal.

Histopathological evaluation of the lesion was compatible with an SC covered with synovial epithelium, including dense calcification and fibrosis regions. The pain and incontinence symptoms of the patient completely disappeared, and there were no problems in the postoperative period. In the early period, physiotherapy was begun for the patient, who showed improvements in other myelopathy signs, and the patient was subsequently transferred to the rehabilitation service.

DISCUSSION

Thoracic SCs are generally asymptomatic slow-growing lesions. Symptoms appear and show an increase over months, or even years. Patients can be admitted due to complaints such as back and lateral pain and force, and sense and reflex disorders in the lower extremities can be observed in about 50% of patients[4,8]. Myelopathy accompanied by loss of bowel and bladder function can also develop[4-5]. A rapid increase in symptoms can develop in traumatic cases, caused by bleeding in the cyst. When a thorax CT of this case taken ten years previously was compared with the preoperative evaluations, a small calcified SC at the T9–10 level was observed, so the cyst had been present in the patient for a long time. This supports the hypothesis that calcified synovial cysts grow, and symptoms and signs can be revealed over time. It is not known why the complaints started when they did, because there was no trauma history of the patient, and the lesion did not grow by internal bleeding.

The pathogenesis of SCs is still controversial, and some hypotheses have been reported in the literature[7,11]. One suggestion is that an SC develops as a result of chronic mechanical pressure on the facet joint, and an increase in inflammatory factors produced in the joint and locally released to the environment[11]. In addition, it has been suggested that synovial tissue exiting the secondary joint capsule due to trauma or instability can develop SCs[7]. The reason for the rare development of SCs in the thoracic region relative to the lumbar and cervical regions is thought to be because the thoracic vertebrae are relatively more stable and immobile[3,5].

Diagnosis of thoracic SCs can be difficult, particularly for patients who have multiple degenerative changes in the vertebrae. By spinal CT, SCs can be observed at low density in the neighborhood of the facet joint, and sometimes as calcified lesions, as in our case[10]. MRI is a gold-standard radiological examination for diagnosis of SCs[6,8]. Spinal SCs are observed as being hypointense in T1-weighted sections and hyperintense in T2-weighted sections by MRI[6]. The cyst wall can demonstrate regular environmental enhancement. SCs with internal bleeding are observed as hyperintense in T1-weighted sections and hypointense in T2-weighted sections by MRI, due to hemoglobin products[6]. In a differential diagnosis, extramedullar lesions such as arachnoid cysts, perineural (Tarlov) cysts, neurinoma, and meningioma, which are commonly seen in this region, should be considered[6].

For patients with pain and facet cysts, conservative treatment should be applied primarily. Bed rest, analgesic and anti-inflammatory drugs, corset use, and physiotherapy are among the conservative treatment options[2]. Percutaneous cyst aspiration or epidural/intra-articular steroid injection can be attempted, particularly for elderly patients for whom surgery presents a high risk. Although conservative treatment is primarily suggested for SC treatment, patient satisfaction has been shown to be unsatisfactory in a clinical series with more than six months of follow-up in the literature[2,10]. Therefore, surgical treatment should be considered for patients with neurological signs or who receive no benefit from conservative treatment. Total removal of the cyst is the only factor improving the clinical result[2]. Therefore, the main aims of surgery are total cyst excision and removal of other current pathologies without any damage to the patient. Although partial hemilaminectomy

with medial facetectomy is generally sufficient, wider decompression is required for cysts that are large, calcified and/or adhered to the dura. In the present case, total laminectomy was applied to both levels, for a calcified cyst adhered to the dura at the T9–10 level and a large central disc-osteophyte complex at the T5–6 level, and sufficient decompression was provided. This process should be meticulously and carefully performed with neuromonitorization, due to the possible postoperative complications. With this technique, extra area was first gained by decompression performed on the left of the calcified SC with TUR during surgery, and then the lesion was left as a 'floating island' on the spinal cord by decompression of the right side. As the lesion was removed with the next step of this technique, the pressure on the spinal cord was minimized. Calcified SCs tend to indent the dura, and dural injury can occur during dissection. As a result, in patients with neurological signs in particular, surgical treatment is associated with good clinical results, as in this case, and should be considered first.

The application of posterior spinal fusion after surgical excision is controversial. Although there have been articles in the literature reporting that the clinical results of patients who received spinal fusion after laminectomy were better than for patients who received only laminectomy[9], there are also articles suggesting that there is no difference between the results[12].

In our case, fusion was performed between T4–12 with posterior spinal instrumentation because a two-level total laminectomy was performed. Therefore, development of any symptoms due to possible instability was avoided, and it was possible to start the rehabilitation period early. In addition, we think that the fusion decision should be made according to the evaluation of every patient independently.

In conclusion, thoracic SCs should be considered in the differential diagnosis of lesions causing myelopathy, especially in adult patients with degenerative processes in other regions. Surgical treatment should be considered primarily, especially in the presence of neurological signs, and is associated with good clinical results. The surgical approach to be performed and the decision regarding fusion should be made according to an evaluation of every patient independently, and the aim should be total cyst resection and to provide sufficient and safe decompression.

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