A Case of Epidural Lipomatosis With Lumbar Canal Stenosis
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Summary

Objective: Idiopathic symptomatic spinal epidural lipomatosis is not a common clinical condition. There are a few cases reported in the literature discussing the magnetic resonance imaging (MRI) findings of epidural lipomatosis. Characteristic imaging findings of this clinical condition is represented.

Methods: Evaluation of epidural fat and thecal sac is ideal with MRI. Involved vertebra level is seen optimal as well. Literature suggests decompressive surgery with fat debulking for symptomatic relief for patients with neurological deficits diagnosed with epidural lipomatosis and lumbar canal stenosis if conservative therapy fails to respond.

Results: A severe case of spinal epidural lipomatosis with lumbar canal stenosis is presented. Characteristic MRI and CT findings of lumbar canal degeneration, dural sac compression, deformity and significant fat deposition are demonstrated.

Conclusion: Epidural lipomatosis may cause neurological complications and deficits such as neurogenic claudication or radicular symptoms. Weight reduction should be attempted for symptomatic relief. Symptoms and neurological findings should determine therapeutic paradigm.

Key words: Magnetic resonance imaging, neurological deficit, fat, epidural, lumbar spine

Lumbar Kanal Stenozu ile Birlikte Olan Bir Epidural Lipomatosis Vakası

Özet

Amaç: İdiopatik semptomatik spinal epidural lipomatosis vakalarına ve manyetik resonans görüntüleme (MRG) bulgularını tartışan makalelere literatürde az rastlanmaktadır. Yazımızda epidural lipomatozisin karakteristik görüntüleme bulgularını sunduk.

Yöntem: MRG epidural yağ ve tekal kese, tutulan vertebra seviyelerini değerlendirirken idealdir. Epidural lipomatosis ve lomber kanal stenozu olan hastalarda nörolojik hasar varsa semptomların iyileşmesi için literatür dekompresif cerrahi ve yangın o bölgeden mümkün olduğuna uzaklaştırılmasını önermektedir.

Sonuçlar: İleri derecede spinal epidural lipomatosis ve lomber kanal stenozu olan vakada lomber kanal dejenerasyonu, dural kese bası, deformite ve yoğun yağ birikimini karakteristik MRG ve bilgisayarlı tomografi görüntüleri ile sunduk.


Anahtar Kelimeler: Manyetik resonans görüntüleme, nörolojik hasar, yağ, epidural, lomber
INTRODUCTION

Epidural lipomatosis of the lumbar spine is a rare condition which is described as accumulation of fat in the extradural territory. This is usually secondary to an uncommon complication of long term iatrogenic corticosteroid administration or endocrinologic disorder or obesity\(^{(4,2)}\). If neurological deficits develop it is usually in the thoracic spine more than the lumbar spine\(^{(4)}\). In this case report we represent clinical and imaging findings of a lumbar spine idiopathic epidural lipomatosis along with review of previous cases in literature.

MATERIAL AND METHODS

This study was approved by the Institutional Ethical Committee. 79 old gentleman presented with clinical symptoms of neurological deficits, intermittent claudication, findings of lumbar stenosis, frequent severe low back pain increase with walking, leg pain and numbness. The patient admitted that he used to walk for hours until recently. However nowadays his walking capacity became 50 meters before he complained of severe low back pain and claudication. Straight leg raising test was 50 degree. Evaluation using manual muscle testing for motor function, revealed slight weakness of both legs. Bladder function was normal. He was not obese, and there was no history of corticosteroid therapy, or Cushing disease or diabetes mellitus.

MRI examination was performed with 1.5 Tesla units (Siemens, Germany.) consisted of T1 axial and sagittal images with following parameters:

- T1 axial TR/TE 564/9, 4 mm slice thickness, intersection gap 0.8 mm, matrix 205x320, FOV 184x230.
- T2 axial TR/TE 3720/107, 4 mm slice thickness, intersection gap 0.8 mm, matrix 245x384, FOV 183x230.
- T1 sagittal TR/TE 380/11, 3 mm slice thickness, 0.9 mm intersection gap, matrix 230x320, FOV 270x270.

CT scanning was performed with 128 multislice equipment (Siemens, Germany). CT showed high grade thecal sac compression, lumbar canal degeneration, and significant fat deposition. Extensive arterial atherosclerotic calcifications were also noted.

RESULTS

Spinal epidural lipomatosis involved the levels of L4, L5 and S1 levels but not seen more cranial or caudally. Lumbar spinal canal was significantly narrow at these levels secondary to degenerative changes. There was also L4 on L5 level grade 1 anterior spondylolisthesis. (Figure 1 and 2).

Regarding patient's severe symptoms, neurological deficits, intermittent claudication, lumbar stenosis, frequent severe low back pain, significant decrease of walking capacity, but not being obese, no history of corticosteroid therapy, or Cushing disease he was recommended debulking neurosurgery for lumbar stenosis after 4 weeks of conservative therapy which did not respond any symptomatic relief. The patient admitted that his lifestyle and daily activities are deteriorating however, he refused surgery.
**Figure 1-a:** Sagittal T1 weighted MR image of lumbar spine demonstrates abundant epidural fat compressing thecal sac. **Figure 1-b.** Axial T1 weighted MR image of lumbar spine showing tapering off thecal sac due to excessive epidural fat accumulation. **Figure 1-c.** Axial T2 weighted image from same level demonstrates ‘Y’ sign indicates high grade thecal sac compression.

**Figure 2:** Axial CT image of lumbar spine from same level as in MR images. This image shows excessive amount of hypoattenuating fat surrounding and compressing the thecal sac.
DISCUSSION

Epidural lipomatosis of the lumbar spine is a rare condition. Geers et al observed in approximately 0.8% of patients undergoing lumbar spine MRI in a 2 year study. Fat shows demonstrative high signal intensity on T1-weighted MR images. This enables detection of abnormally accumulated extradural fat. MR images usually show a polygonal spiculated Y shaped, or stellar deformation of the dural sac in association with epidural fat overgrowth. Geers et al indicated that this could be explained by the presence of structures connecting the outer surface of the dura mater to the osteofibrous walls of the lumbar spinal canal and location and compression of continuous meningocephal ligaments in the epidural space. Thecal sac collapsed because of posterior or anterior to move after or toward one by applying continuous force of dura mater. Spiculations of polygonal sections correspond to the dural insertion site of the ligaments and the intervening depressions correspond to the mass effect of the excessive epidural fat which narrows spinal canal and makes nerve roots vulnerable in these patients. Continuity of the ligaments might explain random problems in epidural anesthesia, such as inhomogeneous spread of the injected anesthetic drugs, failure of catheter introduction, or deviation of the ascending guide that stumbles over resistant connective bands, leading to lateral positioning of the catheter. Excessive manipulations of the catheter may cause iatrogenic dural leakage or epidural hemorrhage by injury of the epidural vessels running in close anatomic relationship with the ligaments.

Naka et al used grading system from 1 to 3 for epidural lipomatosis evaluation according to severity of dural compression. When one level show ‘Y’ sign axial grading this indicates a specific sign of lumbar thecal compression on axial MR images and was considered to be grade 3 as in our patient.

Weight reduction should be attempted in case of no acute progression of symptoms. Borstlap et al indicated reversibility of some cases of epidural lipomatosis after weight reduction diet. Male preponderance was identified with previous reports. Symptoms and neurological findings should determine therapeutic paradigm. If diet therapy is not successful, or if the patient is in acute neurological deterioration decompressive surgery with debulking should be considered. Yoshinori et al presented all of their seven patients achieved symptomatic relief after lumbar surgery.

We should be careful not to completely rely on the grading of imaging findings since presence of fat is correlative with symptoms however, may not be predictive of the extent of neurological deficit which determines therapeutic indications.

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