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Review Article

Spinal Epidural Lipomatosis-An Enigmatic Cause of Back Pain

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Abstract: Spinal epidural lipomatosis is a disease involving excessive deposition of adipose tissue within epidural space of spinal canal, most commonly associated with exogenous steroid usage. Patients may be asymptomatic or may present with a low backache, weakness, and claudication. Diagnosis is usually made on MRI showing compression of dura by excessive epidural fat. Severe cases may show stellate or 'Y' sign. Increasing incidence of obesity and more common use of steroids has led to increased incidence of SEL over years. The main mode of treatment is conservative with surgery reserved for refractory cases**.**

Keywords: SEL / Spinal epidural lipomatosis, steroids, adipose tissue, epidural.

INTRODUCTION

Spinal epidural lipomatosis (SEL) is a rare disease characterised by pathological non-neoplastic overgrowth of mature unencapsulated adipose tissue within epidural space of spinal canal [1]. It is most commonly seen in patients chronically using exogenous steroids (55%) [2]. Usually, SEL develops in patients with moderate to high dose of steroids for years. Other causes include obesity (25%), endocrinopathies such as Cushing syndrome (3%) and idiopathic (17%) [2].

DISCUSSION

Gradual onset mono/polyradiculopathy is usual presenting complaint. Males are more commonly affected than females, 70% of affected cases being males [3, 4]. Mean age of occurrence is approximately 43 years [5]. Fat deposition leads to the gradual development of signs of neural compression and cauda equina syndrome. Neurological symptoms are more commonly associated with thoracic involvement which may present with multiple neurological deficits. The most common presentation includes a low backache with gradually increasing weakness in lower limbs, sensory symptoms such as paresthesia, numbness and radiculopathy. Bladder and bowel incontinence may occur in rare cases [6]. Some patients may be asymptomatic [7-9]. Physical examination reveals reduced sensations such as pinprick and altered reflexes, other than weakness in the lower extremity [10]. SEL may involve spinal cord / conus medullaris / cauda equina. Thoracic involvement is most common, followed by lumbar. Cervical SEL has never been reported [11].

The level of canal involvement determines the type of presentation. Patients with thoracic involvement present with progressive myelopathy while those with lumbar involvement present with radiculopathy. SEL is classified into three grades (I to III) depending on the amount of epidural fat.

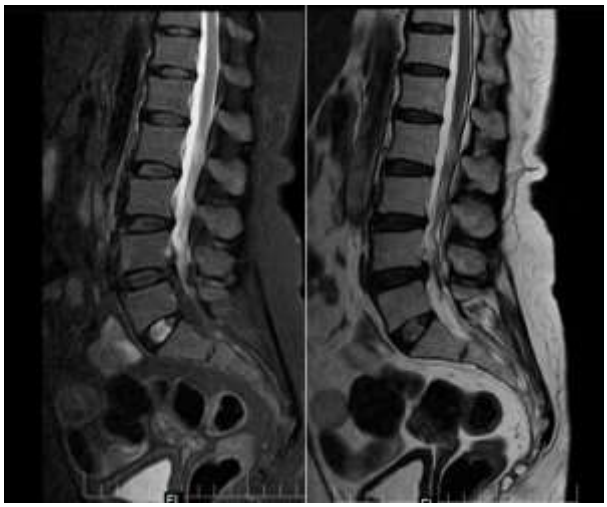

Fig-1: STIR sagittal and T1 sagittal images reveal narrowing of dural sac due to widened adipose tissue showing hypointensity

A radiograph is usually done to rule out other causes of a backache – like tumours, degenerative

disease. CT scan, though not usually performed, can measure the attenuation of adipose tissue (80-120 HU) in epidural space [12, 13]. Myelography was used in earlier days when MRI was not available and showed obstruction at the level of compression with hourglass configuration, thus, differentiating epidural mass from the intradural lesion. MRI is an investigation of choice and shows dural compression by excessive adipose tissue leading to obliteration of CSF space and stenosis of the spinal canal , showing hyperintensity on T1W & intermediate to low signal intensity on T2W images [3]. Diagnostic criteria of SEL are the thickness of adipose tissue > 7 mm. Y sign / stellate sign can be seen in grade–III SEL on axial images [14].

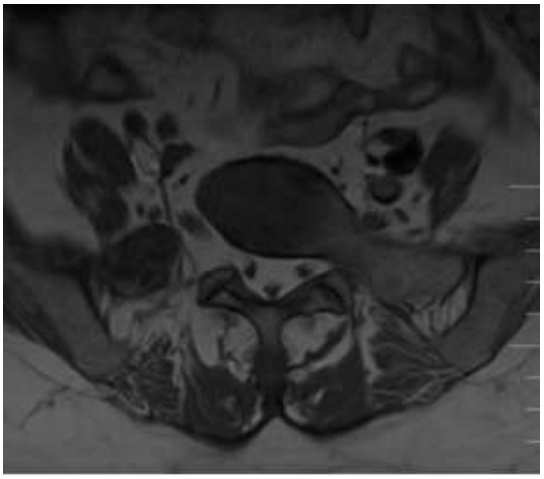

Fig-2: Axial T1 weighted images reveal Y / stellate sign caused by excessive compression of dural sac at anL5-S1 level in grade III SEL

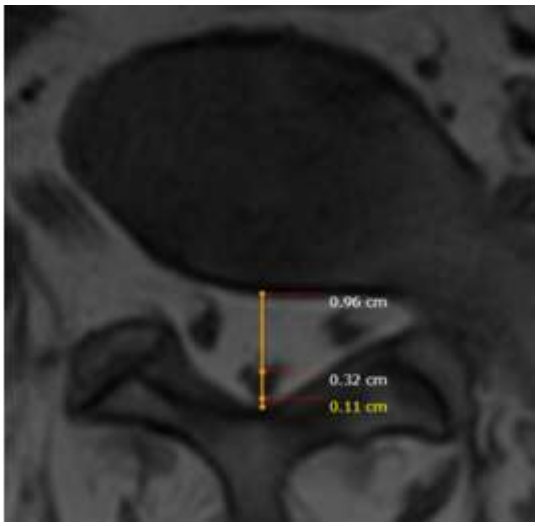

Fig-3: Dural sac: Epidural fat index= 0.29 and Epidural Fat : Spinal canal index = 77 % suggestive of grade III SEL

MRI rules out other causes of a backache and also rules out other causes of epidural compression such as lipoma. Naka *et al* gave grading system from 1 to 3 for evaluation of SEL [15]. Bore etal classified SEL into 4 grades (0, I, II and III) based on a percentage of adipose tissue.

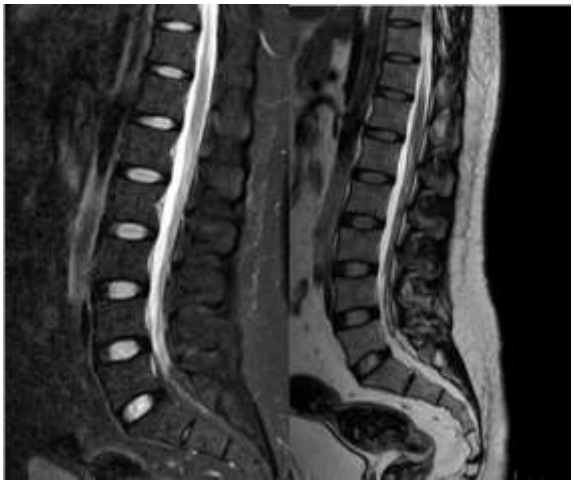

Fig-4: STIR and T1 sagittal images reveal increased amount of epidural fat leading to compression of dura

SEL can be treated by conservative treatment or surgery. Conservative treatment includes analgesics and caudal block. In cases associated with obesity, primary treatment is weight loss (15 Kg or more weight loss is recommended) [16]. In those associated with steroid usage, primary treatment is a reduction in steroid dose / stopping steroids. Those not receiving steroids should have a workup for causes of endogenous steroid production. Patients should be thoroughly evaluated for multifactorial causes of a backache. Patient with lumbar involvement responds better than those with thoracic involvement.

Surgical management includes decompressive laminectomy and debulking of adipose tissue. Multiple surgeries may be rarely required [17]. Surgery is done only if conservative treatment fails or symptoms are rapidly progressive. Very rarely, the patient may require multiple surgeries due to re accumulation of fat in epidural space. Interventional pain management is absolutely contraindicated in these patients as it is ineffective due to epidural fat deposition and epidural steroids worsen patient's symptoms.

Judicious use of MRI in patients on exogenous steroids helps in early diagnosis and hence, less morbidity. Since gradual neural compression leads to the disease process, rapid decompression with surgery may not relieve symptoms. Conservative approach is generally favoured, particularly in patients with comorbidities. Conservative treatment with steroid withdrawal and weight loss usually result in a reduction of epidural fat with reversal of compression and gradual improvement of symptoms. Surgery may be considered in patients with acute neurological deterioration. Though surgery itself has a good outcome, long-term increase in morbidity has been reported.

Patients on lower pre-treatment steroid dosage respond better to surgery. Idiopathic SEL has are latively better prognosis. Surgery should be preceded with correction of the cause of endogenous steroid overproduction.

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