

Lumbar Extradural Synovial Cyst: An Uncommon Cause of Cauda Equina Syndrome

Abstract

Synovial cysts (SC) of the spine are cystic dilatations of the synovial sheaths commonly found in the lumbar spine region. Most of the patients with lumbar synovial cysts (LSC) tend to occur in their fifth to sixth decade of life with a slight female predominance. The etiology of LSC is still unclear, but underlying spinal instability, facet joint arthropathy and degenerative spondylolisthesis has a strong association for worsening symptoms and formation of spinal cysts. These can cause myeloradiculopathy depending on the level of compression to the spinal cord or the peripheral nerve roots. LSC resistant to conservative therapy should be treated surgically. Surgical excision and decompression with or without fusion and spinal instrumentation remains debatable. SC may recur following surgery. This fact collaborates with the aim of this report presentation of an elderly with LSC complicated with progressive cauda equina syndrome. Magnetic resonance imaging (MRI) revealed a single extradural LSC at L4 level and L4/5 spinal canal stenosis. We performed complete excision biopsy and posterior instrumentation with decompression for this patient. The neurological status of the patient was improved on follow-up examination postoperatively.

Keywords: *Lumbar synovial cyst, Cauda Equina syndrome, Posterior instrumentation and fusion*

Introduction

Extradural cysts arise from a diverticulum of arachnoid, which has herniated through a dural defect [6]. There appear to be two distinct clinical pictures associated with spinal extradural cysts [7]. The first type was defined by Elsberg, Dyke, and Brewer (1934), whereby the patient is an adolescent with the history and symptoms of progressive spastic paraplegia, while the second type occurs in adults, usually in the lumbo-dorsal spine, whereby the cyst is not associated with dorsal kyphosis [2]. The most frequent presentation of a LSC is with intermittent low back pain in the absence of motor or sensory impairment, classical radiculopathy and acute exacerbation of symptoms because of hemorrhage. They rarely occur after the injury of the back [4]. The origin of extradural cysts may be spontaneous or post traumatic [4]. Intraspinal synovial or ganglion cysts are widely recognized. Extradural SC may be asymptomatic or may cause compression of neural structures and hence associated clinical symptoms. SC formation is commonly associated with osteoarthritis, particularly in the knee and wrist. Cysts associated with the hip joint are uncommon but have been previously documented [3]. They occasionally occur after trauma and may cause femoral nerve palsy. Most of the patients present with radicular pain and neurological deficits. They may be unilateral or bilateral and at one or multilevel. MRI is considered for the characterization of synovial cysts and for preoperative planning.

Case Report

73-year-old retired woman presented with low dull aching back pain worsening upon coughing, sneezing or prolonged standing, associated with bilateral painful radiculopathy for a period of two months. She also had weakness and neurogenic claudication of both legs. There were no urinary or bowel incontinence. The symptoms affected her much as she preferred to stay at home rather than doing outdoor activities. On examination, there was right calf muscle wasting with spasticity. The power of right lower limb is 4 over 5. There was diminished sensation to light touch in the distribution of the L3 and L4 dermatomes. The straight-leg-raise test shows positive at 50 degrees on the right side. MRI of his spine showed an obvious L4 intracanal synovial cyst with L1/2 to L4/5 posterior disc bulge with L3/4 & L4/5 bilateral exit foramina stenosis and L4/5 spinal canal stenosis (Figure 1). Intraoperatively, posterior elements from L3 to L5 were exposed and a 3 cm x 3 cm synovial cyst was visualized at the right lateral aspect of the spinal cord (Figure 2). Posterior instrumentation and decompression was done (Figure 3). It was excised and subsequent histopathological examination is consistent with synovial cyst (Figure 4). Post-operatively, her symptoms were greatly improved in conjunction with regular physiotherapy. After one year of being followed up at our clinic, she was discharged without any complications.



Fig. 1: Preoperative T2 weighted MRI showing L4 intracanal synovial cyst with L1/2 to L4/5 posterior disc bulge with L3/4 & L4/5 bilateral exit foramina stenosis and L4/5 spinal canal stenosis

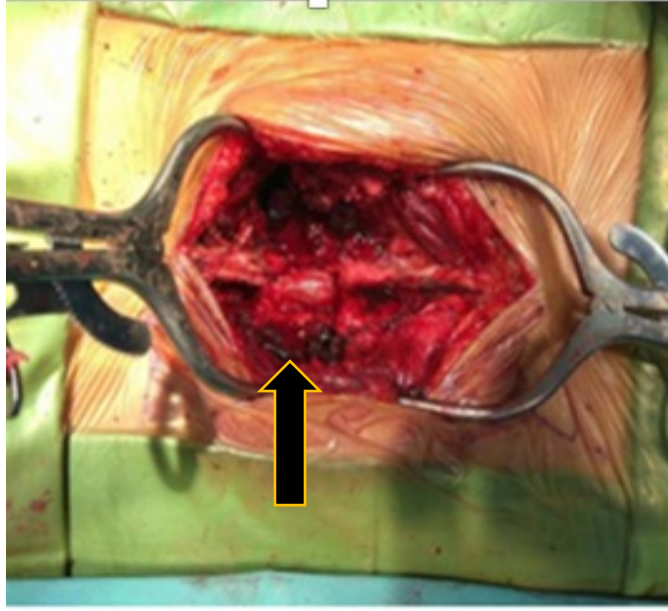


Fig. 2: Intraoperative photograph showing 3cm x 3cm synovial cyst at right lateral spinal cord of L4 level



Fig. 3: Post-operative x-ray showing decompression and posterior instrumentation of L4/5 was done

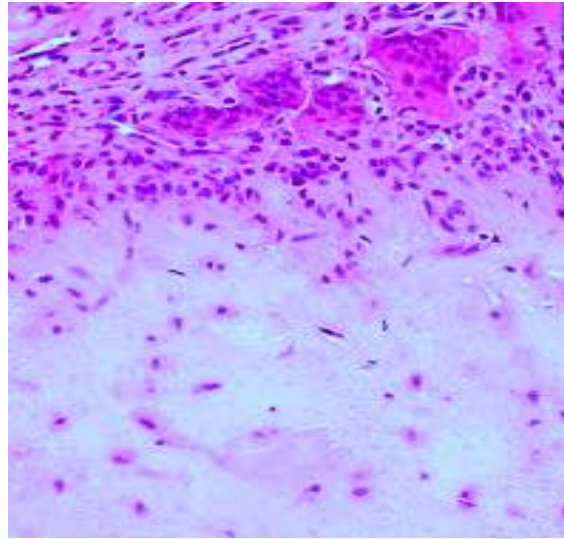


Fig.4: Histopathological examination of synovial cyst showing a benign cystic structure lined by fibrous tissue with synovial lining

Discussion

The incidence of LSC is less than 0.5% of the general symptomatic population. They may be asymptomatic and found incidentally or the epidural growth of cysts into the spinal canal can cause compression of neural structures and hence associated clinical symptoms [1]. Most of the symptomatic LSC patients present with radicular pain and neurological deficits. They may be unilateral or bilateral and at one or multilevel. Spinal SC are commonly found at L4-5 level, the site of maximum mobility [11]. As the lower half of the thoracic column is involved frequently in extradural cyst more common than the upper half of the thoracic region, while the cervical and sacral regions are rare [3].

The symptom varies at different level of pathology. The duration may be as short as a few weeks or as long as few years. It more commonly extends over several years [9]. The main differential diagnoses to be considered are prolapsed intervertebral disc, tumors and Tarlov's perineurial cysts [5]. Patients with extradural cysts may present with dull low backache, which may be aggravated by coughing, sneezing and bending as can see in this patient. Standing and sitting usually precipitates the pain but lying flat often relieves it [5]. Some patients may give a history of a sharp root pains radiating in segmental distribution, relieved by bed rest [9]. Remissions and fluctuation of symptoms with varying positions of the body occur in about one-third of cases [8]. This can be accounted for by a free communication between the cyst and the subarachnoid space or by a valvular mechanism in the cyst allowing emptying or filling according to the strain placed upon the lower spine and the posture of the body [5]. In some cases, temporary or progressive cauda equina compression may give rise to nocturnal enuresis or urinary incontinence [5]. Loss of libido and potency as well as bowel disturbance have been reported by Abbott 1956, Cloward 1968. It would seem that there is a tendency for lumbar extradural cysts to manifest at a later age than dorsal cysts. A likely explanation is that the lumbar canal is spacious; and the cauda equina is readily displaced, so that cysts may grow without giving rise to symptoms for a longer period in the lumbar spine than is possible in the dorsal region [7]. Clinically it is difficult to distinguish between extradural lumbar cyst and prolapsed intervertebral disc as both conditions may present in the same manner. In this particular patient a diagnosis of prolapsed

102 intervertebral disc with spinal stenosis is possible to be considered as patient is above age of 50 years
103 old. Other differential diagnosis such as arachnoid cyst, epidermal cyst, dermoid cyst and teratomatous
104 cyst should be rule out.

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106 Radiographs of the lumbo-sacral spine show erosion of the sacrum but this feature is common to
107 most space-occupying lesions in this area (Camp and Good 1938). MRI appears useful as an initial
108 modality to identify the cystic mass. Myelography and/or CT myelography are essential to reveal any
109 connection between the cyst and the subarachnoid space [10]. The presence of contrast medium within a
110 sac, in conjunction with erosion of bone or widening of the vertebral canal, is strong evidence in favour
111 of an extradural cyst [6]. The only definitive treatment possible is laminectomy as the lesions were
112 always in the posterior, thus giving a good exposure. Surgical treatment is required when neurological
113 symptoms develop due to cyst induced spinal cord or nerve root compression. Although numerous
114 surgical treatment methods have been proposed, the results of surgery were variable [11]. Preoperative
115 myelomalacia and long duration of symptoms have been implicated as being predictive of poor surgical
116 outcome. The operative treatment most commonly advocated has been total excision of the cyst.

117 118 119 **Conclusion**

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121 Most of the reported cases of extradural cyst have shown progressively increasing disability, despite
122 remissions. There is conservative management such as bed rest, analgesic, physiotherapy, corset, steroid
123 injection or direct cyst puncture. Some symptomless cysts will be found incidentally at myelography
124 done to confirm a prolapsed intervertebral disc (Sole-Llenas 1963). Operation should always be
125 considered in synovial cysts, which are resistant to conservative. Surgical excision of extradural cyst
126 often improves morbidity of patients as conservative treatment has limited role in improving their
127 symptoms. As seen in this case, decompression and posterior instrumentation with fusion remains the
128 best option for this patient. We conclude that removal of LSC with subsequent adequate fixation (with or
129 without instrumentation) should be strongly considered to prevent recurrent symptoms and cysts at the
130 site of removal especially if the spine is deemed unstable [1].

131 132 **CONSENT**

133 As per international standard or university standard, patient's written consent has been collected and
134 preserved by the authors.

135 136 **ETHICAL APPROVAL**

137 It is not applicable.

138 139 **COMPETING INTERESTS**

140 Authors have declared that no competing interests exist.

141 142 143 **References**

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