



Case Report

Case of the Week: Preoperative MR/CT Diagnosis of Left L2-L3 Disc Surgically Documented As Massive Synovial Cyst

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ABSTRACT

Background: The diagnosis of a lumbar herniated disc, stenosis, and other degenerative findings are typically established preoperatively with MR scans, supplemented with non-contrast CT studies. Here, a 77-year-old female, diagnosed as having L2-S1 stenosis and a large left-sided L2-L3 herniated disc was found at surgery to have a massive left-sided L2-L3 synovial cyst.

Case Description: A 77-year-old female was followed by pain management for 6-months with proximal left lower extremity weakness. The lumbar MR at that time was read as demonstrating a large left L2-L3 disc herniation with inferior migration to the L3 mid pedicle level, accompanied by L2-S1 lumbar stenosis. When she finally consulted neurosurgery, she exhibited severe left iliopsoas and quadriceps weakness (2/5), absent lower extremity reflexes, and profound decreased pin appreciation in the left L2-L3 distributions. The repeat MR and new CT studies confirmed a large left L2-L3 disc accompanied by moderate/marked L2-S1 stenosis. However, at surgery, consisting of a laminectomy L2-S1, the supposed left L2-L3 disc proved to be a massive synovial cyst. Postoperatively, the patient regained normal function, and remained neurologically intact 6 months later.

Conclusion: In this 77 year-old female, the preoperative MR and CT scans were interpreted as showing a “typical” large left L2-L3 herniated disc. This proved at surgery to be a massive left L2-L3 synovial cyst. As demonstrated in this case, older patients with degenerative lumbar disease/stenosis, may have synovial cysts that mimic disc herniations both clinically and on preoperative diagnostic studies.

Key words: Lumbar Disc; Synovial Cyst; Stenosis; MR; CT Diagnosis

INTRODUCTION

Prior to surgery, lumbar herniated discs are frequently diagnosed on MR/CT studies as accompanying spinal stenosis. Here, a 77-year-old female with the classical preoperative diagnosis of a left-sided L2-L3 herniated disc accompanied by L2-S1 lumbar stenosis was found at surgery to have a massive left L2-L3 synovial cyst. In older patients, there should be a greater anticipation that synovial cysts rather than disc herniations may accompany degenerative lumbar disease/stenosis.

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CASE

A 77-year-old female, followed by pain management, presented with 6 months of proximal left lower extremity pain, weakness, and numbness. The 6-month old MR demonstrated significant lumbar stenosis L2-S1, and was interpreted as showing a large left L2-L3 disc herniation with marked inferior migration to the left L3 mid-pedicular level. Two months prior to presentation, she had undergone two epidural steroid injections. When she was finally seen by neurosurgery, she had significant left iliopsoas/quadriceps weakness (2/5), absent lower extremity reflexes, and profound pin loss in the left L2-L3 distributions. The follow-up MR



Figure 1: The parasagittal T2 weighted MR scan documented the massive left L2-L3 synovial cyst extrusion located both dorsolaterally and inferiorly extending to the mid L3 pedicle level, accompanied by multilevel L2-S1 stenosis.



Figure 2: The axial T2 weighted MR showed the massive extruded left L2-L3 synovial cyst extending to the mid left L3 pedicle level. Here it resulted in marked left thecal sac and left L3 root compression.

and new CT studies were similarly interpreted as showing L2-S1 stenosis and a left-sided L2-L3 disc. However, when she underwent a L2-S1 laminectomy, the left L2-L3 lesion proved to be a massive synovial cyst [Figs. 1, 2]. Postoperatively, the patient's symptoms immediately resolved, and she remained neurologically intact 6 months later.

DISCUSSION

Etiology and Location of Synovial Cysts

In 2004, Epstein noted synovial cysts occur as the result of arthrotic disruption of the facet joint. With degenerative spondylolisthesis, (DS), synovial cysts may occur in up to 40% of cases.^[2] Most patients with synovial cysts are in their mid-60's, and the majority of these lesions occur at the following levels (descending order); L4-L5, L5-S1, L3-L4, and L2-L3.

Myth of Successful Synovial Cyst Aspiration

Synovial cysts are typically tough, firm, and tenacious, with large fibrous capsules adherent to surrounding dura/nerve roots. They contain just small amounts of gelatinous tissue and/or thick crank-case fluid. It is, therefore, no surprise that multiple studies reviewed in 2012 by Epstein and Baisden documented a 50-100% failure rate for attempts at percutaneously aspirating these lesions by "pain management specialists" under fluoroscopic or CT-guidance. Rather, surgical excision results in excellent resolution of back and radicular pain (e.g. 91.6-92.5% and 91.1-91.9% recovery respectively).^[3]

Efficacy of Laminectomy Alone for Treatment of Lumbar Synovial Cysts

Multiple studies have documented the efficacy of laminectomy alone for the treatment of lumbar synovial cysts, without the need for fusion. Siu and Stoodley (2018) advocated laminectomy alone for 46 patients with lumbar synovial cysts who were followed an average of 43 mos. (1 month-13 years); only 2 (4.3%) later required fusions.^[6] In 2018, Epstein successfully treated an elderly male with large bilateral L3-L4 synovial cysts filling the canal, along with grade I L3-L4 spondylolisthesis (static on dynamic X-rays), and L2-L4 stenosis; this was successfully treated with L2-L4 laminectomy for decompression of stenosis and bilateral L3-L4 synovial cyst excision without fusion.^[4] When Hohenberger *et al.* (2019) evaluated 5313 patients undergoing decompressive surgery (e.g. laminotomy (93.4%) or hemilaminectomy (6.6%)) for degenerative spinal disease, 61 patients (1.14%) had symptomatic synovial cysts (SCC): notably, 86.9% were located in the lumbar spine.^[5] Postoperatively, 94.4% of patients fully recovered, and only 6 patients (9.8%) later developed postoperative instability warranting fusion.

Few MR Studies Misdiagnose Lumbar Discs As Synovial Cysts or Tumors

Few MR studies have misdiagnosed lumbar disc herniations as synovial cysts or tumors. In 2010, Teufack *et al.* treated a 49-year-old male whose enhanced MR scan showed a dorsolateral peripherally enhancing epidural lesion resulting in marked dural compression.^[7] Although the preoperative differential diagnoses included hematoma, synovial cyst, and epidural abscess, at surgery, this proved to be a large herniated disc. Out of a series of 1153 surgical procedures performed for supposed lumbar disc herniations (2006-2016), Alfonso *et al.* (2018) found that 2 lesions were misdiagnosed on preoperative MR scans as a (1) pseudotumor and (2) meningioma respectively. In the case presented here, the patient had a large left L2-L3 extruded lesion with inferior migration that was originally misdiagnosed as a lumbar disc, but proved intraoperatively to be a massive synovial cyst.^[1]

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

Conflicts of interest

There are no conflicts of interest.

CONCLUSION

On rare occasion, lumbar synovial cysts may mimic herniated lumbar discs that have extruded dorsolaterally [Figs. 1, 2]. Intraoperative confirmation of the correct level of the synovial cyst extrusion may help differentiate this from disc, and avoid additional unnecessary discectomy.

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