

Complications of Lumbar Facet Synovial Cyst Rupture

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Myth: Lumbar facet synovial cyst rupture carries a high risk for complications such as acute cauda equina syndrome and epidural hematoma.

Fact: There have been few reports of complications secondary to this procedure. Risks of lumbar facet cyst rupture may include increased pain, infection, and nerve root compression.

Background

Lumbar facet synovial cysts (LFSC) arise from the facet joint capsule and are thought to be part of a degenerative process or increased segmental mobility that impose additional stress on the facet joints. These cysts are benign and, in many cases, cause no symptoms. Depending on size, location, and contents, these cysts can cause nerve root compression, radicular pain, or claudication [1,2]. These should be distinguished from Tarlov cysts or discal cysts.

Using CT or fluoroscopic guidance, LFSC rupture is a commonly used treatment option. After needle guidance into the facet joint, and using contrast medium to confirm intra-articular access, saline, local anesthetic (LA) alone, or a mixture of LA and steroid can be used to rupture the LFSC via pressurization. One retrospective study included 100 patients who underwent LFSC rupture, defined by the authors as a contrast pattern consistent with spill into the epidural space [1]. The study included 81 patients with successful rupture. Fifty-five percent of those patients ultimately required decompression surgery to remove the cyst. Final categorical success rates were not published. There was no mention of complications of the LFSC rupture procedure. Subsequent studies have delineated MRI characteristics of LFSCs that correlate with a greater likelihood of a positive treatment outcome following facet cyst rupture. LFSCs that demonstrate a hyperintense or intermediate signal on T2-weighted imaging are associated with higher rates of successful rupture, possibly due to the fact that such cysts contain a greater proportion of fluid versus viscous or calcified material [2].

Risk of Complications

Data suggest that, while rare, significant complications of LFSC rupture can occur. Two studies did not specifically address or include reports of any complications association with LFSC rupture [1,3]. One study reported complications including worsening pain, epidural hematoma, and infection [4], while other studies have described cases of increased pain that resolved with medication or time alone [5,6]. Cases of worsened pain have required surgical decompression [1,2,7] to relieve the pain. Two cases of symptomatic epidural hematoma requiring surgical decompression have been reported following spontaneous LFSC rupture [8]. In neither case was the epidural hematoma attributed to an intervention. The effect of anticoagulant/antiplatelet medication on developing an epidural hematoma is unknown. There is at least one case of cellulitis after LFSC rupture that resolved with oral antibiotic treatment [4]. An epidural or spinal abscess has never been reported in association with cyst rupture. Other complications include LFSC rupture into an unintended space. Cambron *et al.* reported two cases of rupture of LFSC contents into the subarachnoid space, without any sequelae [2].

Alternative Procedures

The alternative to percutaneous LFSC rupture is decompressive surgery, which carries significant risks. A large systematic review of 82 published studies, including a total of 966 patients, demonstrated that many patients who underwent surgery for the treatment of LFSC continued to suffer from pain (22%) and 2% experienced recurrence of a cyst. The overall surgical complication rate was 4.8%. Complications included deep venous thrombosis, cerebrospinal fluid leak, dural tear, and death [9].

Other interventional procedures have been described to treat lumbar LFSC. One small retrospective study examined intra-articular facet joint injection in combination with a lumbar transforaminal steroid injection and reported no complications [10]. Another study investigated the long-term effectiveness of direct CT-guided aspiration and fenestration of symptomatic lumbar facet synovial cysts [11]. This study did not explicitly address or report on any complications.

Conclusions and Recommendations

- Large studies investigating the safety and effectiveness of LFSC rupture have not been conducted. Patients undergoing LFSC rupture should be advised on effectiveness and risks of the procedure, based on the published evidence, acknowledging its shortcomings.
- As with all interventional spine procedures, universal infection control precautions should be employed.
- There is insufficient data to conclude whether or not concurrent treatment with antiplatelet or anticoagulant medication increases the likelihood of a spinal epidural hematoma.

References

1. Martha JF, Swaim B, Wang DA, Kim DH, Hill J, Bode R, Schwartz CE. Outcome of percutaneous rupture of lumbar synovial cysts: a case series of 101 patients. *Spine J* 2009;9:899-904.
2. Cambron SC, McIntyre JJ, Guerin SJ, Li Z, Pastel DA. Lumbar facet joint synovial cysts: does T2 signal intensity predict outcomes after percutaneous rupture?. *AJNR Am J Neuroradiol* 2013;34:1661-4.
3. Eshraghi Y, Desai V, Cajigal Cajigal C, Tabbaa K. Outcome of percutaneous lumbar synovial cyst rupture in patients with lumbar radiculopathy. *Pain Physician* 2016;19:E1019-25.
4. Huang AJ, Bos SA, Torriani M, Simeone FJ, Chang CY, Pomerantz SR, Bredella MA. Long-term outcomes of percutaneous lumbar facet synovial cyst rupture. *Skeletal Radiol* 2017;46:75-80.
5. Kozar S, Jeromel M. Minimally invasive CT guided treatment of intraspinal synovial cyst. *Radiol Oncol* 2014;48:35-9.
6. Foley BS. Percutaneous rupture of a lumbar synovial facet cyst. *Am J Phys Med Rehabil* 2009;88:1046.
7. Kursumovic A, Bostelmann R, Gollwitzer M, Rath S, Steiger HJ, Petridis AK. Intraspinal lumbar juxtaarticular cyst treatment through CT-guided percutaneous induced rupture results in a favorable patient outcome. *Clin Pract* 2016;6:866.
8. Wait SD, Jones FD, Lonser RR, Lee KS. Symptomatic epidural hematoma caused by lumbar synovial cyst rupture: report of two cases and review of the literature. *Neurosurgery* 2005;56:E1157.
9. Bydon A, Xu R, Parker SL, McGirt MJ, Bydon M, Gokaslan ZL, Witham TF. Recurrent back and leg pain and cyst reformation after surgical resection of spinal synovial cysts: systematic review of reported postoperative outcomes. *Spine J* 2010;10:820-6.
10. Sabers SR, Ross SR, Grogg BE, Lauder TD. Procedure-based nonsurgical management of lumbar zygapophyseal joint cyst-induced radicular pain. *Arch Phys Med Rehabil* 2005;86:1767-71.
11. Shah VN, von Fischer ND, Chin CT, Yuh EL, Amans MR, Dillon WP, Hess CP. Long-term effectiveness of direct CT-guided aspiration and fenestration of symptomatic lumbar facet synovial cysts. *AJNR Am J Neuroradiol* 2018;39:193-198.