Outcomes of Surgical and Image-Guided Percutaneous Management of Symptomatic Lumbar Facet Synovial Cysts

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BACKGROUND

Lumbar facet synovial cysts are an uncommon but clinically significant cause of low back pain and lumbar radiculopathy. Surgical decompression remains the traditional treatment, however, image-guided percutaneous interventions, including fluoroscopic- and computed tomography (CT)-guided aspiration, have emerged as minimally invasive alternatives that may provide symptom relief while avoiding surgical complications. Despite increasing adoption, the evidence supporting these procedures remains heterogeneous, and there is no consensus regarding patient selection, procedural technique, or expected long-term outcomes.

OBJECTIVES

This review aimed to compare surgical and minimally invasive image-guided percutaneous treatments for lumbar synovial cysts, evaluating recurrence and reintervention rates as well as pain relief at various time points.

METHODS

A systematic review was conducted in Covidence according to PRISMA guidelines. A search of PubMed and Harzing's Publish or Perish (Google Scholar) was performed to identify studies evaluating surgical and image-guided percutaneous management of lumbar facet cysts. Search terms included lumbar, facet, synovial, zygapophyseal, cyst, aspiration, rupture, fenestration, percutaneous, surgery, fluoroscopy, and computed tomography (CT).

Initial search yielded 783 records. Studies reporting outcomes following surgical excision or percutaneous intervention were eligible for inclusion. Following title/abstract screening and full-text reviews, 66 studies met inclusion criteria. However, reviews, duplicate patient cohorts, abstracts without sufficient data, and studies lacking extractable outcomes were excluded, resulting in 8 image-guided studies and 8 surgical studies.

Data extraction included study characteristics, intervention type, follow-up duration, pain outcomes, functional outcomes, cyst recurrence, repeat intervention, and subsequent surgery.

Outcome	Group	Total N	Events	Pooled Rate	95% CI Lower	95% CI Upper
Need for Surgical Reintervention	Aspiration	880	326	34.7%	28.5%	41.5%
Need for Surgical Reintervention	Surgery	1329	144	12.7%	8.6%	18.3%
Recurrence of Cyst On Imaging	Aspiration	500	237	45.8%	26.0%	67%
Recurrence of Cyst On Imaging	Surgery	411	42	9.4%	5.2%	16.7%
Pain Relief Immediately After Intervention	Aspiration	95	80	79.2%	69.3%	86.6%
Pain Relief Immediately After Intervention	Surgery	52	37	83.0%	20.8%	98.9%
Pain Relief 1 Year After Intervention	Aspiration	83	28	49.8%	19.7%	80.0%
Pain Relief 1 Year After Intervention	Surgery	166	150	90.1%	84.4%	93.8%

Table 1. Pooled event rates of outcomes for surgical versus percutaneous management.

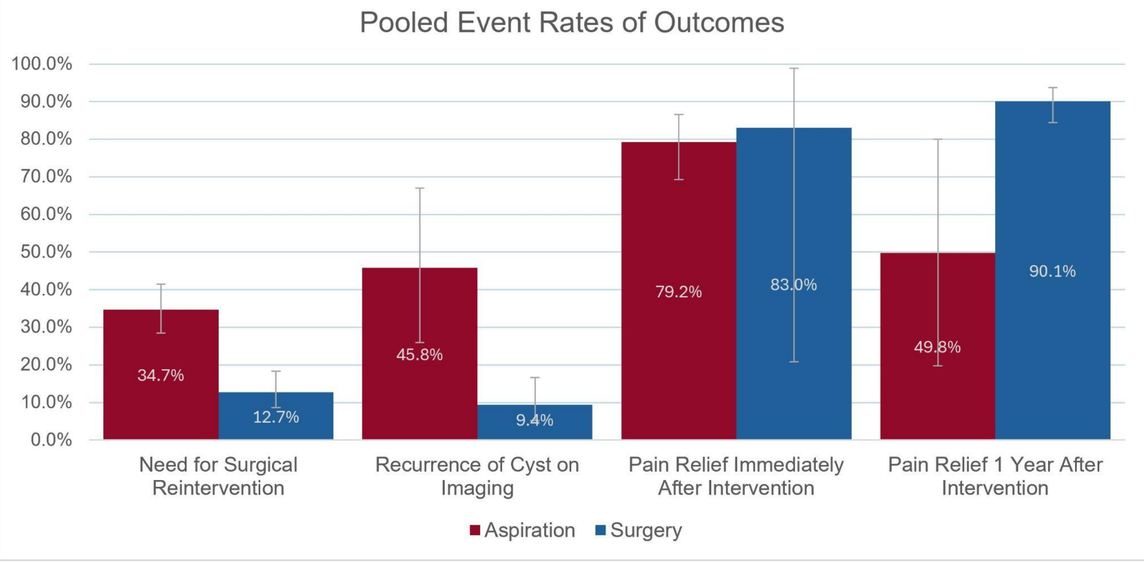


Figure 1. Pooled event rates of outcomes for surgical versus percutaneous management. Error bars represent 95% confidence intervals.

RESULTS

- Initial surgical management was associated with lower pooled reintervention rates than image-guided aspiration
- Cyst recurrence was lower following surgery, although there was substantial heterogeneity
- Pain relief immediately after intervention was similar for surgery and aspiration, although there was pronounced heterogeneity for surgery due to limited studies reporting immediate pain outcomes
- Pain relief after 1 year was greater following surgery than aspiration
- Pain relief occurred 6 months after aspiration but could not be compared to surgery due to insufficient data

DISCUSSION

- Surgical management demonstrated lower pooled rates of recurrence and reintervention, and greater durability of symptom relief
- Image-guided percutaneous techniques may be a suitable minimally invasive alternative for select patients
- Interpretation of these findings is limited by substantial heterogeneity in study design, outcome definitions, follow-up duration, and reporting practices
- Future studies with standardized reporting and longer-term follow-up may better define optimal patient selection and clarify the comparative effectiveness of surgical versus percutaneous management

REFERENCES

1. Boody BS, Savage JW. Evaluation and Treatment of Lumbar Facet Cysts. J Am Acad Orthop Surg. 2016 Dec;24(12):829-842. doi: 10.5435/JAAOS-D-14-00461. PMID: 27792054.
2. Ganga A, Leary OP, Setty A, Xi K, Telfeian AE, Oyelese AA, Niu T, Camara-Quintana JQ, Gokaslan ZL, Zadnik Sullivan P, Fridley JS. Optimizing surgical management of facet cysts of the lumbar spine: systematic review, meta-analysis, and local case series of 1251 patients. J Neurosurg Spine. 2023 Aug 18;39(6):793-806. doi: 10.3171/2023.6.SPINE23404. PMID: 37728373.
3. Allen TL, Tatli Y, Lutz GE. Fluoroscopic percutaneous lumbar zygapophyseal joint cyst rupture: a clinical outcome study. Spine J. 2009 May;9(5):387-95. doi: 10.1016/j.spinee.2008.08.008. Epub 2008 Sep 21. PMID: 18809358.

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