ORIGINAL

Transforaminal Full-Endoscopic Surgery for a Juxta-Facet Cyst Under Local Anesthesia : A 2.5-Year Follow-Up of Ligamentum Flavum Repair—A Case Report

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Abstract : A juxta facet cyst is a relatively uncommon disease that is usually treated by cyst removal and nerve decompression surgery. Nowadays, these cysts can be removed by endoscopic surgery, which is minimally invasive and allows rapid recovery. In this report, we present a 60-year-old man with a left-sided juxta facet cyst at L4/5 who underwent transforaminal full-endoscopic cyst removal and left L5 nerve root decompression under local anesthesia. The surgery was performed via an 8-mm incision while the patient was awake and there were no complications. The patient's leg pain score decreased to 1/10 postoperatively and he returned to work 2 weeks after the surgery. There has been no recurrence during 2.5 years of follow-up. Interestingly, the ligamentum flavum repair has been observed in the time since the surgery. We believe that transforaminal full-endoscopic surgery under local anesthesia is the least invasive surgery for juxta facet cysts. J. Med. Invest. 73 : 88-91, February, 2026

Keywords **:** *juxta facet cysts, transforaminal full-endoscopic, local anesthesia, ligamentum flavum repair*

INTRODUCTION

Juxta facet cyst (JFC), also known as facet joint cyst, arises from the zygapophyseal joint capsule in the spine and was first called by Kao *et al*. in 1974 (1). This relatively rare cyst usually occurs in the lumbar spine, most often at L4/5, and has no clear etiology (2). JFC can cause radiculopathy, back pain, cauda equina syndrome, and/or claudication. Treatment options for JFC are conservative management and surgery (3-5). Until a few years ago, surgery for JFC usually consisted of open or microscopic decompression (3). However, nowadays, there is the option of endoscopic surgery, which has many advantages. Patients with JFC that causes radiculopathy can undergo a fully endoscopic procedure that requires an incision of only 8 mm via a transforaminal approach under local anesthesia while awake. Postoperative recovery is rapid, with minimal risk of damage to other spinal structures after surgery (6). This report presents an interesting clinical case in which the ligamentum flavum repair was observed on MRIs obtained during 2.5 years of follow-up after percutaneous transforaminal endoscopic decompression for lumbar radiculopathy caused by JFC.

CASE REPORT

Medical history

The patient was a 60-year-old male office worker who commuted to the workplace by bicycle. He did not participate in any sports or strenuous physical activities. He presented to our hospital with a 6-month history of left-sided buttock and leg pain. The pain worsened when walking, and he could only work in a sitting position. His symptoms did not respond to conservative treatment, and he could only walk for 5-10 min even with painkiller medication.

Physical examination

Sensation, motor strength, and tendon reflexes were almost normal. Kemp's test was positive on the left, the straight leg raises on the left was positive at 45 degrees, and the crossed straight leg raise test was positive at 80 degrees.

A lumbar spine MRI (Figure 1A), a CT scan after a left-sided facet block at L4/5 (Figure 1B), a flexion–extension radiograph, and an L5 nerve root block (Figure 2) were performed to make an accurate diagnosis. The final preoperative diagnosis was left-sided juxta facet cyst at L4/5.

Surgical procedure

Full-endoscopic undercutting laminectomy and resection of the left-sided JFC at L4/5 under local anesthesia was planned. The patient was placed in a prone position on a spinal surgery table. The L4/5 disc level and position for accurate placement of the endoscope were confirmed under fluoroscopy. First, a spinal needle was inserted into the facet joint on the left at L4/5, and 1 mL of indigo dye was injected to mark the cyst. Next, 1% lidocaine was administered to the dorsal aspect of the facet joint at L4/5, the L5 pedicle, the L5 vertebral endplate, annulus, and between the discs for local anesthesia via an 18G percutaneous transhepatic cholangiography (PTC) needle. The PTC needle and the guide wire were used to create the trajectory for the dilator series and endoscope. After confirming that there were no symptoms in the lower limb, a duckbill cannula was inserted and checked for accurate placement under fluoroscopy. Immediately after the endoscope was inserted, the bleeding was stopped using a bipolar cautery device. The superior articular process (SAP) at L5 pedicle was identified, and the ventral surface of the SAP and the pedicle were enlarged using a high-speed drill. The area was stained dark blue when the resection of the SAP reached facet joint. The ventral surface of the inferior articular process (IAP) was drilled up to the caudal side of the L4 pedicle, and the cyst was identified.

The cyst wall was resected, and the stained contents of the

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cyst were released. The ligamentum flavum was resected, the L5 nerve root was identified, and the area between the cyst wall and the L5 nerve root was dissected using the tip of the cannula. The cyst wall and ligamentum flavum were removed as much as possible, and the L5 nerve roots were thoroughly decompressed. A drain was inserted, and the surgery was completed.

Postoperative care, recovery, and follow-up

The drain was removed on the first postoperative day. After surgery, the patient's leg pain was assessed using the Numerical Rating Scale (NRS), where 0 indicates no pain and 10 indicates the worst possible pain. The pain score improved from 8 preoperatively to 1 postoperatively. The straight leg raise test on the left side was negative, and the crossed straight leg raise test was normal. At 2 weeks after surgery, the patient returned to work, could ride a bicycle, and could walk for 1 km without pain. A postoperative CT scan confirmed that the facet cyst was completely resected (Figure 3).

The patient has now been followed up for approximately 2.5 years. During this time, we have assessed the postoperative changes on lumbar MRIs. We have observed no change in lumbar alignment but have noticed the ligamentum flavum repair. The imaging findings since the surgery confirm complete removal of the FJC, decompression of the spinal canal and L5 nerve root on the left, with the ligamentum flavum repair in the foraminal area at L4/5 over time (Figure 4).

DISCUSSION

Juxta facet cyst is an uncommon lesion but cannot be considered rare. The relevant literature consists mainly of isolated clinical case reports, case series, or retrospective studies containing larger numbers of patients collected over many years (4, 7-10).

Non-surgical treatments for JFC have been reported,

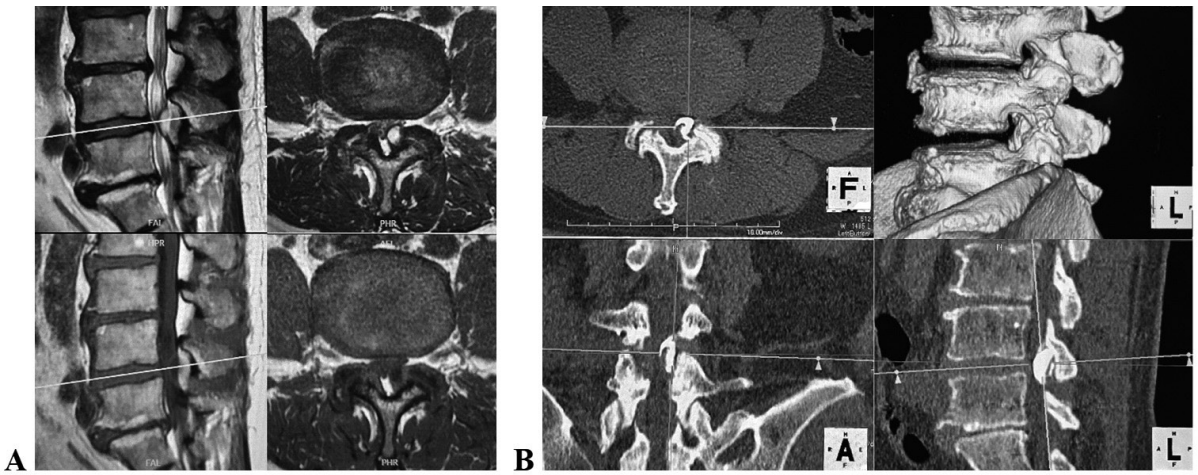

Figure 1. JFC as shown on preoperative MRI and CT scans
(A) MRI revealed an extradural mass lesion continuous with the left L4/5 facet joint and compressing the left L5 nerve root. The center of the lesion showed low intensity on T1-weighted images and high intensity with marginal low intensity (representing the cyst wall) on T2-weighted images.
(B) CT clearly showed the margin of the lesion after facet block and contrast injection.
CT, computed tomography ; JFC, juxtafacet cyst ; MRI, magnetic resonance imaging.

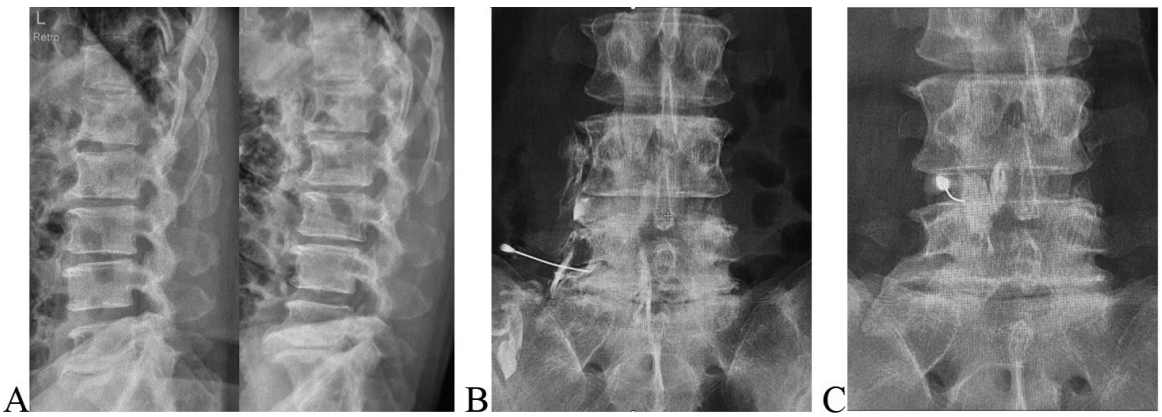

Figure 2. Lumbar dynamic X-ray, left L5 nerve root block, and left L4/5 facet joint contrast injection
(A) Lumbar flexion and extension X-rays showed no instability.
(B) Left L5 nerve root block was effective result.
(C) Left L45 facet joint showed a mass extending into the spinal canal and connected to the facet joint.

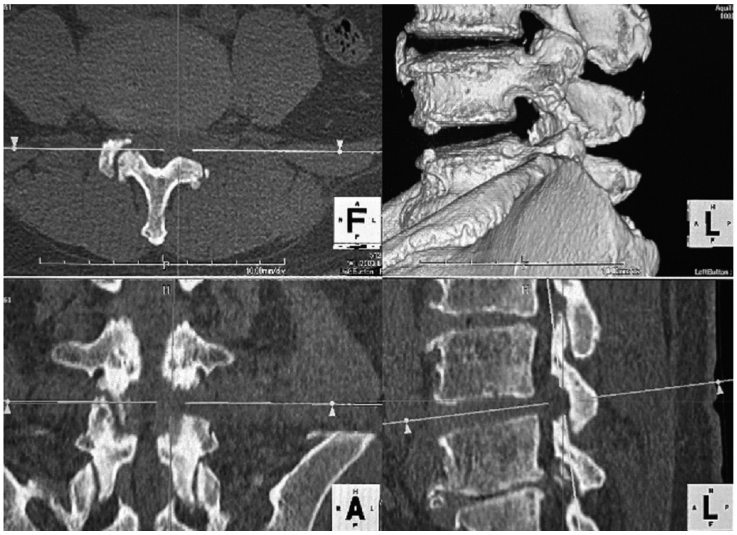

Figure 3. Postoperative CT scan after left L4/5 foraminotomy and facet cyst removed
The left L5 superior articular process and the ventral surface of the left L4 inferior articular process were resected.
CT, computed tomography.

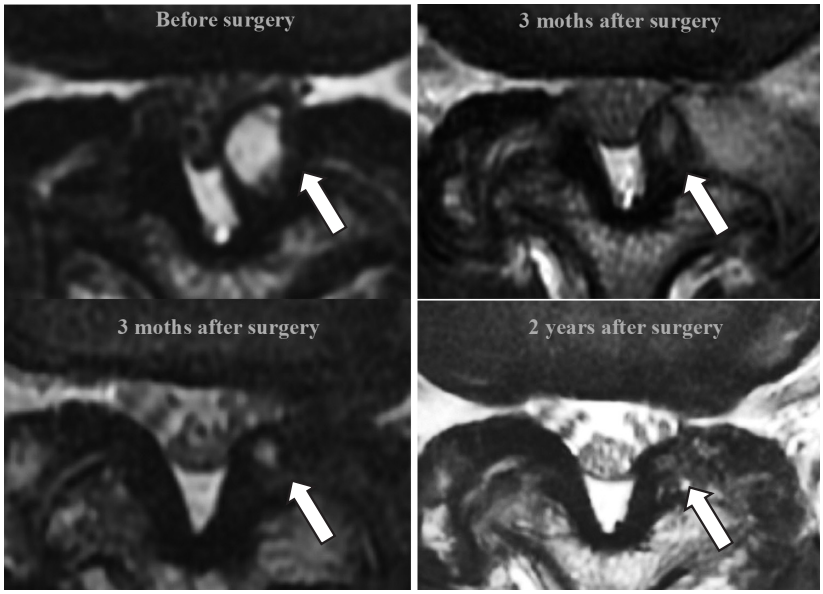

Figure 4. Follow-up MRI showing changes in the left L4/5 foraminal ligamentum flavum
The red arrow indicates the facet cyst. The hyperintense nodules on T2-weighted images have decreased and the ligament structure has become increasingly homogeneous. Three months after surgery, the facet cyst demonstrated a reduction in size. Continued regression of the cyst was noted at one and two years postoperatively, which was associated with progressive expansion of the spinal canal.
MRI, magnetic resonance imaging.

including rupture of the cyst by high-pressure saline injection into the facet joint and steroid or prostaglandin injections. However, their efficacy has been limited. Surgical intervention is typically indicated for the most of patiens and after failure of conservative treatment (4, 11).

The main indication for surgery is removal of the cyst and nerve decompression without additional instrument fixation. We believe the mechanism of symptom resolution in this procedure consists of two main factors. The first is the opening of the facet joint by resection of the superior articular process (SAP), and the second is the direct decompression of the nerve root by removal of the cyst wall. This principle is similar to the treatment of mucous cysts in other small joints, where severing the connection to the joint of origin is key to preventing recurrence. Therefore, we conclude that the clinical improvement in this case was achieved by a combination of opening the facet joint via SAP resection and direct decompression via cyst wall removal.

In the past, surgical intervention was mainly open or involved microsurgery. However, with the advent of endoscopy, endoscopic surgery is becoming more widespread, and there have been an increasing number of reports on use of an interlaminar or transforaminal approach for surgical removal of JFC (12-14). The FJC can be completely removed and the nerve decompressed using the transforaminal endoscopic surgery technique with an incision

of only 8 mm under local anesthesia. Therefore, this method can be considered the least invasive treatment option for JFC.

Our experience with this endoscopic treatment for facet cysts is still limited to 7 cases, making it difficult to definitively discuss intraoperative complications and postoperative issues at this stage. However, this surgical technique shows potential advantages over existing methods in terms of a reduced risk of dural injury and facilitating an early return to society.

Facet cysts are prone to adhering to the dura mater, and the reported incidence of intraoperative dural tears during conventional surgery is 8% to 11.4%. (15, 16) In contrast, this endoscopic procedure does not require dissection of the ligamentum flavum, thereby significantly reducing the risk of dural injury. Furthermore, biomechanical studies have shown that compared to standard unilateral laminectomy, this technique, which involves drilling only the cranial side of the superior articular process, is less likely to cause postoperative spinal instability. (17)

In our clinical experience, the skin incision was limited to approximately 1 cm, and no muscle dissection was required, which resulted in minimal postoperative pain. As a result, the patient was able to ambulate two hours postoperatively and return to work on the seventh postoperative day. For these reasons, the clinical benefits of this procedure are considered to be substantial.

On the other hand, the postoperative recurrence rate is presumed to be comparable to that of conventional decompression surgery. A recurrence rate of 11.5% has been reported for decompression surgery without spinal fusion, and since this procedure is also a non-fusion technique, the possibility of a similar outcome regarding recurrence rates must be considered. (18)

Reports on follow-up of JFC after surgery are mainly based on clinical recovery and recurrence after surgery. In this case, we have monitored the patient's clinical symptoms during more than 2.5 years of postoperative follow-up and observed good improvement with no recurrence. Interestingly, MRIs obtained during follow-up indicate the ligamentum flavum repair in the area where the JFC was removed to the point that it is similar in appearance to that on the contralateral side. Furthermore, there are no abnormalities in terms of lumbar column alignment or other structural anatomical changes.

To the best of the authors' knowledge, this is the first report to identify anatomical changes on MRI after transforaminal full-endoscopic spine surgery under local anesthesia for JFC.

CONCLUSION

Transforaminal full-endoscopic spine surgery under local anesthesia is the least invasive treatment available for JFC. The symptoms of JFC are resolved, and function is recovered very rapidly after surgery, and tissue can be repaired, returning to almost normal.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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