

Unilateral Biportal Endoscopic Excision of a Lumbar Discal Cyst: A Case Report and Technical Note

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Learning Point of the Article:

Discal cysts, though rare, should be considered in young patients presenting with radiculopathy mimicking lumbar disk herniation. Unilateral biportal endoscopic (UBE) excision is a safe and effective minimally invasive option for the management of discal cysts, providing excellent visualization, complete cyst removal, and rapid post-operative recovery.

Abstract

Introduction: Lumbar discal cysts are rare intraspinal extradural lesions that can mimic lumbar disk herniation and present with radiculopathy. Although transforaminal and interlaminar endoscopic techniques have been described for their excision, reports describing management using unilateral biportal endoscopy (UBE) are limited.

Case Report: A 27-year-old male presented with chronic low back pain and progressive left-sided radiculopathy refractory to conservative treatment, including an epidural steroid injection. Imaging studies revealed a left paracentral discal cyst at the L3–L4 level causing compression of the exiting L3 and traversing L4 nerve roots. The patient underwent cyst excision using a UBE approach. The patient experienced significant post-operative pain relief (Visual Analogue Scale – leg pain improved from 8/10 preoperatively to 1/10 postoperatively) and was discharged the following day. At 6-month follow-up, he remained asymptomatic with no recurrence seen in the magnetic resonance imaging scan.

Conclusion: This case demonstrates that UBE is a safe and effective minimally invasive option for excision of lumbar discal cysts. The technique offers excellent visualization, neural decompression, and early recovery, and may represent a valuable alternative to conventional open, microscopic, or full endoscopic approaches.

Keywords: Degenerative, lumbar, disk, cyst, discal cyst, radiculopathy, low back pain.

Introduction

Lumbar discal cysts are rare intraspinal, extradural cystic lesions that are frequently misdiagnosed as disk herniations or large annular tears and are characterized by a distinct communication with the corresponding intervertebral disk [1]. They commonly present with radiculopathy and/or low back pain [2,3]. Discal cysts have been reported more frequently in Asian male populations, with a median patient age of approximately 30 years [2,4].

Various treatment modalities have previously been described for discal cysts, including conservative management, microscopic cyst resection with or without discectomy, microendoscopic cyst resection, and computed tomography (CT)-guided cyst aspiration [2,5,6,7]. In recent years, these lesions have increasingly been managed using minimally invasive endoscopic techniques due to advances in spinal endoscopy.

Several reports have described endoscopic excision of discal cysts performed through percutaneous transforaminal and

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interlaminar endoscopic approaches [8,9,10,11,12,13,14,15]. However, to the best of our knowledge, reports of excision of lumbar discal cysts using the unilateral biportal endoscopic (UBE) approach are limited.

Case Report

History and clinical examination

A 27-year-old male presented with low back pain for 2 years and radiating pain to the left lower limb for the last 6 months, with leg pain (visual analog scale [VAS] score 8/10) predominating over low back pain (VAS score 3/10) with a progressive aggravation of symptoms. Symptoms were aggravated by prolonged sitting and forward bending. He denied a history of sensory or bowel and bladder disturbances and had no known medical comorbidities. He had previously been managed conservatively in the form of oral non-steroidal anti-inflammatory and gabapentinoid drugs and had received a

transforaminal epidural steroid injection at a different center approximately 2 months before presentation, but experienced only short-term symptomatic relief lasting 1 week (Fig. 1). A neurological examination revealed a positive Lasegue's sign (passive straight leg raising test) on the left side at 30° and was negative on the right side with intact motor and sensory functions. Deep tendon reflexes were preserved, with mild tenderness over the mid-lumbar spine.

Investigations

Plain radiographs and magnetic resonance imaging (MRI) – (plain and gadolinium contrast-enhanced) of the lumbar spine demonstrated a large left paracentral discal cyst at the L3–L4 level which was hyperintense on T2 (Fig. 2a and b) and isointense on T1 (Fig. 2c and d) sequences with septations and post-contrast enhancement (Fig. 2e and f), causing

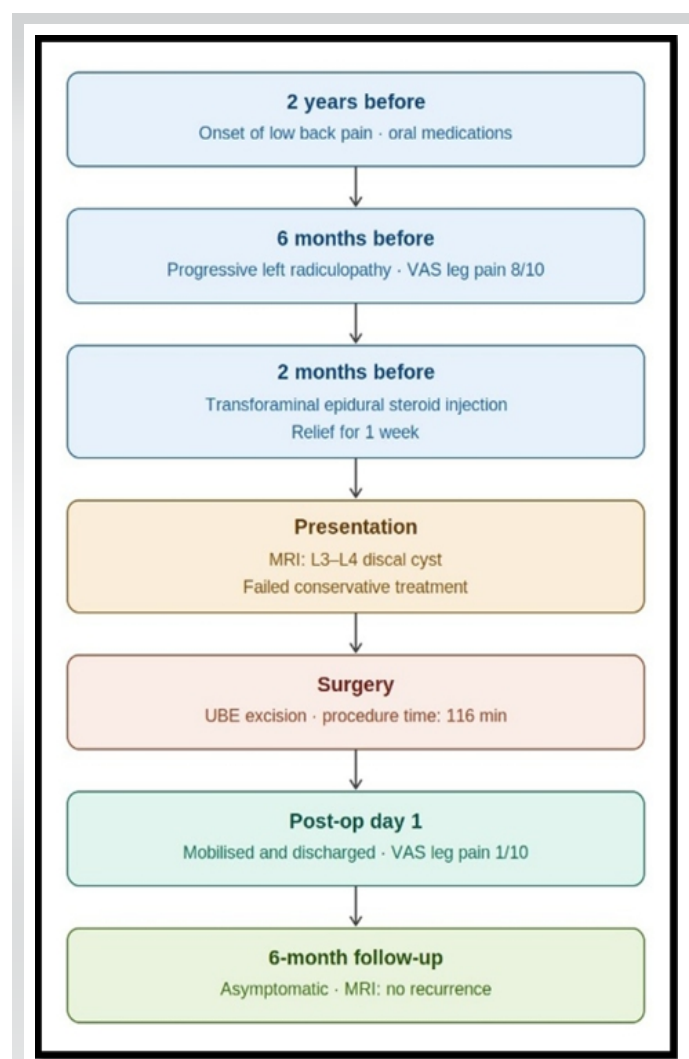


Figure 1: Timeline figure.

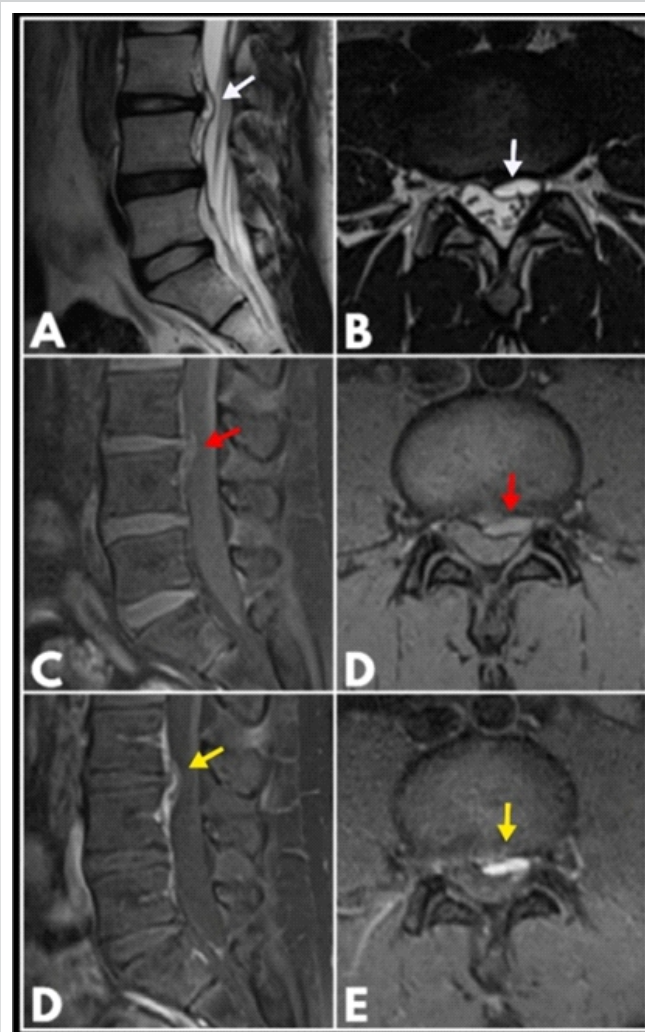


Figure 2: T2-weighted magnetic resonance imaging (MRI) sequences (a and b) demonstrating a hyperintense left paracentral discal cystic lesion at the L3–L4 level (White arrows). T1-weighted MRI sequences (c and d) (red arrows). Post-contrast images demonstrating gadolinium enhancement with septations within the cyst (e and f) (Yellow arrows).

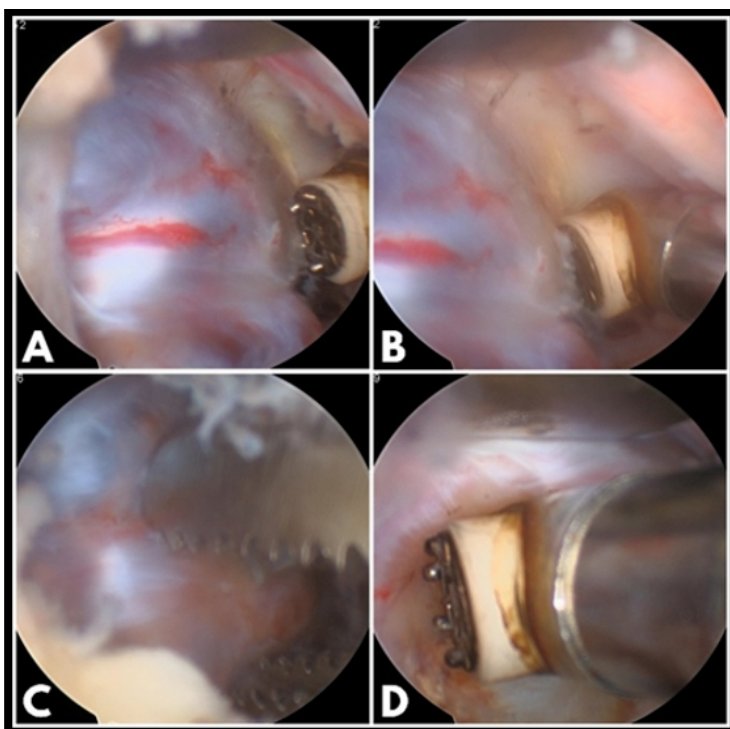


Figure 3: Identification of the discal cyst as a glistening, globular structure with blood vessels in its wall; neural elements are seen stretched and compressed over the cyst (a). Circumferential dissection of the cyst performed using a radiofrequency probe (b). Biopsy specimen obtained with pituitary forceps (c). Cyst debulking followed by ablation of residual tissue (d).

predominant compression of the traversing L4 nerve root, with mild indentation of the exiting L3 nerve root. Degenerative disk changes were also noted at L3–L4 and L4–L5 levels with no signs of a herniated nucleus pulposus (HNP). No radiographic instability was identified.

Treatment plan

Given the persistent radicular symptoms and failure of conservative management, including an epidural steroid injection, and imaging-confirmed neural compression, the patient was planned for UBE excision of the discal cyst. The procedure was performed under general anesthesia with the patient positioned in a prone position over a Wilson frame. A left-sided UBE approach to the L3–L4 level was employed using standard portal placement techniques to establish separate viewing and working portals after level confirmation using biplanar fluoroscopy. The viewing portal was marked along the medial pedicular line of L3, aligned with the disk space (approximately 6 mm in length). The working portal (approximately 8 mm in length) was marked along the medial pedicular line of L4, positioned about 3 cm from the viewing portal. The fascial incision for the viewing portal was made in line with the skin incision, whereas that for the working portal was oriented obliquely.

This configuration allowed the endoscope and working instruments to converge effectively at the spino-laminar junction of the target level.

Serial dilation was performed at the working portal up to 10 mm to facilitate the establishment of free saline flow. A semi-tubular sheath was then introduced through the working portal to regulate saline outflow and guide instrumentation. Gravity-assisted irrigation was utilized, with 3-L saline bottles positioned approximately 3 feet above the level of the operating table. A 0° arthroscope was introduced, and a left interlaminar window was created using radiofrequency (RF) ablation and a high-speed burr.

The traversing L4 nerve root was found to be stretched over the cyst and displaced laterally and dorsally (Fig. 3a). Careful adhesiolysis was performed using a fine dissector and nerve hooks to expose the discal cyst. The thecal sac and nerve root were gently retracted medially using an angled retractor. The cyst appeared as a globular, bluish-white lesion with prominent vascularity over its wall and was easily deformable on gentle palpation with a blunt probe. Circumferential dissection was carried out using an RF probe in coagulation mode (Fig. 3b). A biopsy specimen was obtained using pituitary forceps (Fig. 3c), following which cyst debulking was completed. Residual

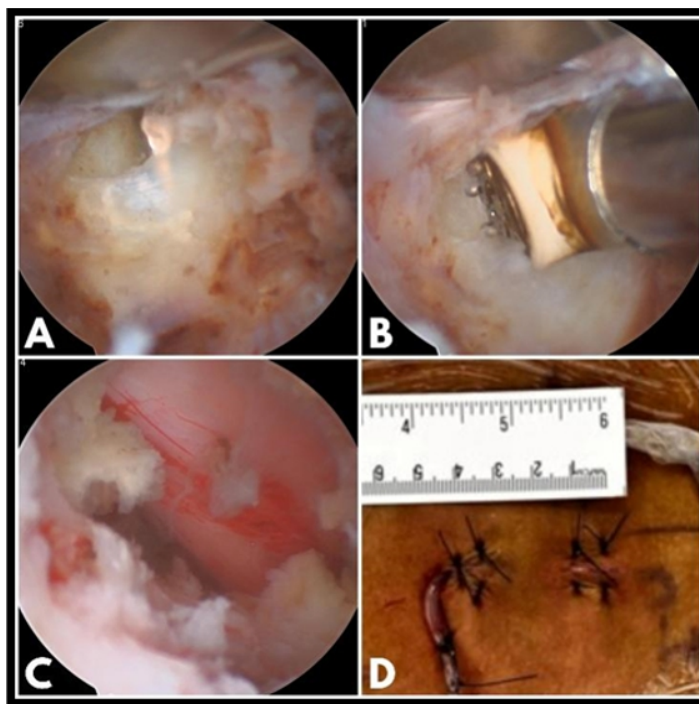


Figure 4: Identification of an annular rent ventral to the cyst location (a). Annuloplasty performed using the radiofrequency probe (b). Adequate decompression achieved with freely mobile neural structures (c). Wound closure performed over a drain (d).

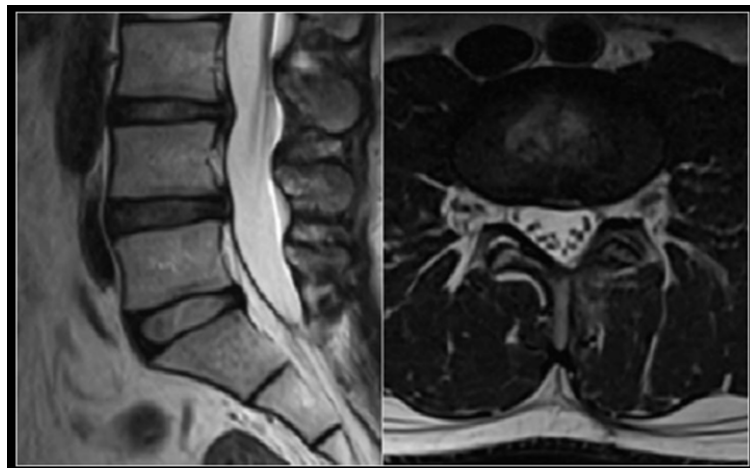


Figure 5: Follow-up magnetic resonance imaging at 6 months demonstrating no evidence of recurrence with preservation of the posterior soft-tissue structures.

cystic tissue was ablated using the RF probe (Fig. 3d).

An annular rent was noted intraoperatively (Fig. 4a); however, no HNP fragments were identified. Annuloplasty was performed using the RF probe in coagulation mode (Fig. 4b). At the conclusion of the procedure, the nerve root and thecal sac were free and demonstrated normal pulsatility (Fig. 4c). Wound closure was performed over a drain (Fig. 4d). The duration of the procedure was 116 min. Quantification of intraoperative blood loss is challenging in UBE surgery due to continuous saline irrigation; however, pre-operative and post-operative hemoglobin levels remained comparable, suggesting minimal blood loss. Postoperatively, the patient reported significant improvement in leg pain (VAS 1/10) and low back pain (VAS 2/10). He was mobilized on the same evening and discharged the following morning.

Histopathological examination of the biopsy specimen (three grey-white soft-tissue fragments, aggregate size $1.1 \times 0.6 \times 0.3$ cm) revealed fibrocollagenous and fibroadipose tissue with a cystic space showing denuded lining, areas of mucoid degeneration, hemorrhage, and sparse chronic inflammatory infiltrate, consistent with a fibrotic cyst wall. No granulomatous or malignant features were identified. The patient resumed routine daily activities within 2 weeks of surgery. At the 6-month follow-up, he remained asymptomatic, with sustained clinical improvement and no recurrence of symptoms. Follow-up MRI demonstrated no evidence of recurrent disc cyst. Follow-up MRI demonstrated no evidence of recurrence, with preservation of the posterior soft-tissue structures (Fig. 5).

Discussion

Kazuo Chiba and colleagues first described lumbar discal cysts as intraspinal extradural cysts communicating with the corresponding intervertebral disk and presenting with

symptoms similar to lumbar disk herniation [1]. In their series of eight cases, characteristic MRI findings were identified, and surgical excision resulted in immediate relief of radicular symptoms.

The exact pathogenesis of discal cysts remains unclear. Discal cysts may develop during the absorption process of a herniated disk, with macrophages playing a key role, as demonstrated in histological and ultrastructural studies [16]. Other proposed mechanisms include focal annular degeneration with fluid accumulation, organization of an epidural hematoma following disk injury, or an inflammatory reaction to disk material [1, 2, 4]. The absence of epithelial lining on histopathology supports a degenerative rather than synovial origin [1].

Since the initial description of discal cysts, multiple treatment strategies have been reported, ranging from conservative therapy and CT-guided aspiration to open microscopic cyst excision with or without discectomy [2]. Although spontaneous regression and successful conservative management have been described [17], persistent radiculopathy and failure of non-operative treatment often necessitate surgical intervention to achieve rapid symptom relief and early functional recovery. The optimal surgical strategy for discal cysts remains debated. Isolated cyst excision appears appropriate in patients without segmental instability or significant mechanical back pain, whereas fusion procedures may be considered in the presence of instability or advanced degenerative changes [18].

CT-guided aspiration has been described as a minimally invasive treatment option [5, 6, 7]. However, evidence regarding long-term outcomes remains limited; the procedure involves significant radiation exposure, and reliable data on recurrence rates are scarce. With advances in spinal endoscopy, full endoscopic approaches such as transforaminal and interlaminar techniques have increasingly been utilized for excision of lumbar discal cysts, offering the advantages of minimally invasive surgery while providing effective neural decompression [8, 9, 10, 11, 12, 13, 14, 15].

Percutaneous endoscopic surgery for lumbar discal cysts has demonstrated favorable clinical outcomes with high patient satisfaction and minimal complications. Four primary studies involving a total of 26 patients have reported consistent results. Ha et al. reported satisfactory outcomes in 87.5% of eight patients [8]; Chen et al. reported excellent or good outcomes in 88.9% of nine patients [12]; Ding et al. reported satisfactory outcomes in 85.7% of seven patients [15]; and Suo et al. reported successful symptom relief in two cases [11]. Across these studies, mean VAS scores for leg pain improved markedly from pre-operative values of 6.86–8.25 to post-operative values

of 1.57–2.25, with similarly significant improvements in Oswestry Disability Index scores. Importantly, no recurrent lesions or serious complications were reported during the respective follow-up periods. Although the current evidence base remains limited in scale, the available literature consistently supports the safety and effectiveness of endoscopic management for lumbar discal cysts.

Interlaminar endoscopic surgery for lumbar discal cysts has also demonstrated favorable clinical outcomes, although the evidence remains limited to small case series [14]. Kim reported successful symptom relief following interlaminar endoscopic decompression using a Ho: YAG laser [13]. These techniques allow targeted decompression with minimal disruption of surrounding structures; however, full endoscopic procedures may be technically demanding due to the limited working channel and restricted instrument maneuverability.

Recently, increasing attention has been directed toward UBE, which combines principles of microscopic surgery with arthroscopic triangulation. This technique allows greater freedom of movement for surgical instruments, as the camera and instruments are introduced through separate viewing and working portals, enabling effective two-handed dissection [19]. Compared with full endoscopy, UBE provides a wider working corridor and improved instrument maneuverability [20], which may be advantageous in cases with dense adhesions, vascular cyst walls, or distorted neural anatomy. Continuous saline irrigation further enhances visualization and facilitates hemostasis. In addition, UBE appears to have a shorter and more manageable learning curve compared with full endoscopic techniques [21]. The infrastructure and equipment costs for UBE are also generally lower than those of dedicated full-endoscopic systems, potentially improving accessibility and wider adoption [22].

To the best of our knowledge, only a single report has described excision of a lumbar discal cyst using the UBE technique. Lin and Pao [23] reported two cases of rare hemorrhagic lumbar discal cysts treated using the UBE approach. Both patients presented with radicular symptoms mimicking lumbar disk herniation. En bloc excision of the cysts was performed, providing excellent visualization and enabling complete removal while preserving surrounding structures. Both patients experienced immediate post-operative symptom relief, with no recurrence noted during follow-up at 12 months. The authors concluded that UBE is a safe and effective minimally invasive alternative for the management of discal cysts, offering advantages such as minimal tissue disruption and favorable clinical outcomes. Available literature suggests that UBE demonstrates clinical outcomes, complication rates, and recovery profiles comparable to those of full-endoscopic

techniques in the management of lumbar degenerative pathology [24]. Nevertheless, UBE carries specific risks related to fluid management, including elevated epidural and intracranial pressures, post-operative headache, and the possibility of overlooking small dural tears within a continuous irrigation field [25]. Awareness of these factors and meticulous intraoperative technique are essential to minimize complications.

The literature regarding the surgical management of lumbar discal cysts remains sparse, with most available evidence limited to case reports and small case series. Although UBE offers potential advantages, including direct visualization, precise neural decompression, and limited tissue disruption, there is currently insufficient comparative evidence to establish its superiority over other surgical techniques. In our case, UBE enabled successful excision of the discal cyst with satisfactory clinical and radiological outcomes at 6-month follow-up and rapid post-operative recovery. However, these findings are based on a single patient and are subject to individual patient characteristics and therefore cannot be generalized to the broader population. This report adds to the currently limited evidence regarding the feasibility of UBE for lumbar discal cyst excision rather than establishing its superiority. Further studies involving larger cohorts, comparative analyses, and longer follow-up are warranted to determine recurrence rates, long-term outcomes, and the appropriate role of UBE in the treatment algorithm for this rare pathology.

Patient perspective

The patient reported severe pre-operative pain that significantly affected daily activities. Following surgery, there was marked improvement in symptoms with a smooth recovery. At follow-up, the patient expressed satisfaction with the outcome and return to normal functional status.

Limitations

This report describes a single L3–L4 paracentral discal cyst with 6-month follow-up, which limits the ability to draw definitive conclusions regarding the long-term efficacy, recurrence rates, and durability of symptom relief following UBE. The findings are also subject to individual patient characteristics and clinical circumstances and therefore cannot be generalized to the broader population. In addition, the patient had no significant degenerative changes or spinal instability, representing a single-level, single-pathology experience. Consequently, the favorable outcome observed may not be directly applicable to discal cysts occurring at other spinal levels or to patients with concomitant degenerative disease, spinal instability, multilevel pathology, or

other complex anatomical features. Larger studies involving patients with diverse clinical and radiological presentations, longer follow-up, and comparative analyses are required to establish the long-term outcomes, recurrence rates, and broader applicability of UBE and to better define its role in the management of this rare pathology.

Conclusion

UBE may represent a feasible minimally invasive approach for selected lumbar discal cysts, providing direct visualization and effective decompression with favorable short-term clinical outcomes. However, given the rarity of discal cysts and the limited available evidence, including the single-case nature and short follow-up of the present report, these findings should be interpreted cautiously. Larger case series with longer follow-up

and comparative studies are required to establish the long-term efficacy, safety, recurrence rates, and relative advantages of UBE over other treatment modalities.

Clinical Message

Lumbar discal cysts are rare causes of lumbar radiculopathy and should be considered in young patients presenting with unilateral radicular symptoms, particularly when imaging demonstrates a ventrolateral extradural cystic lesion adjacent to an intervertebral disk. Accurate diagnosis with MRI and careful correlation with clinical findings are essential. UBE excision provides a minimally invasive approach that allows direct visualization and decompression of the affected nerve root while minimizing tissue disruption. In appropriately selected patients, this technique can provide satisfactory short-term clinical and radiological outcomes.

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

Conflict of interest: Nil **Source of support:** None

References

- Chiba K, Toyama Y, Matsumoto M, Maruiwa H, Watanabe M, Nishizawa T. Intraspinal cyst communicating with the intervertebral disc in the lumbar spine: Discal cyst. Spine (Phila Pa 1976) 2001;26:2112-8.
- Agosti E, De Maria L, Belotti F, Gatti E, Bruzzone M, Amaddeo P, et al. Lumbar discal cysts: A systematic literature review of diagnostic features and treatment strategies. Eur Spine J 2025;34:5539-55.
- Kim SY. Radiculopathy caused by discal cyst. Korean J Pain 2014;27:86-9.
- Aydin S, Abuzayed B, Yildirim H, Bozkus H, Vural M. Discal cysts of the lumbar spine: Report of five cases and review of the literature. Eur Spine J 2010;19:1621-6.
- Dasenbrock HH, Kathuria S, Witham TF, Gokaslan ZL, Bydon A. Successful treatment of a symptomatic L5/S1 discal cyst by percutaneous CT-guided aspiration. Surg Neurol Int 2010;1:41.
- Kang H, Liu WC, Lee SH, Paeng SS. Midterm results of percutaneous CT-guided aspiration of symptomatic lumbar discal cysts. AJR Am J Roentgenol 2008;190:W310-4.
- Endo Y, Miller TT, Saboeiro GR, Cooke PM. Lumbar discal cyst: Diagnostic discography followed by therapeutic computed tomography-guided aspiration and injection. J Radiol Case Rep 2014;8:35-40.
- Ha SW, Ju CI, Kim SW, Lee S, Kim YH, Kim HS. Clinical outcomes of percutaneous endoscopic surgery for lumbar discal cyst. J Korean Neurosurg Soc 2012;51:208-14.
- Jha SC, Higashino K, Sakai T, Takata Y, Abe M, Nagamachi A, et al. Percutaneous endoscopic discectomy via transforaminal route for discal cyst. Case Rep Orthop 2015;2015:273151.
- Manabe H, Higashino K, Sugiura K. A rare case of a discal cyst following percutaneous endoscopic lumbar discectomy via a transforaminal approach. Int J Spine Surg 2019;13:92-4.
- Suo S, Chen Y, Mao X, Chen S, Fu Z. Percutaneous endoscopic surgery for lumbar discal cyst: Two case reports. J Med Cases 2020;11:178-81.
- Chen S, Suo S, Li C, Wang Y, Li J, Zhang F, et al. Clinical application of percutaneous transforaminal endoscopic surgery in lumbar discal cyst. World Neurosurg 2020;138:e665-73.
- Kim JS, Choi G, Jin SR, Lee SH. Removal of a discal cyst using a percutaneous endoscopic interlaminar approach: A case report. Photomed Laser Surg 2009;27:365-9.

14. Kasempipatchai P, Kesornsak W, Kuansongtham V. Removal of discal cyst using percutaneous full endoscopic via interlaminar route: A case report. *Egypt J Neurosurg* 2023;38:48.
15. Ding S, Zhang G, Gao Y, Hou Z, Shao F. Percutaneous endoscopic resection of lumbar Discal cyst. *Pain Physician* 2024;27:E873-9.
16. Kobayashi S, Takeno K, Uchida K, Yayama T, Nakajima H, Miyazaki T, et al. Pathogenesis of the discal cysts communicating with an adjacent herniated disc. Histological and ultrastructural studies of two cases. *Joint Bone Spine* 2010;77:184-6.
17. Jadhav N, Sivakumar L, Talibi SS, Momoh P, Rasul F, Hussain RA, et al. Lumbar discal cyst and post-operative discal pseudocyst: A case series. *J Surg Case Rep* 2022;2022:rjac239.
18. Huang H, Li G, Deng J, Chen R, Zhou Y. Case Report: Endoscopic cystectomy vs. Lumbar interbody fusion for liquid- and gas-filled discal cysts: A case series and literature review. *Front Surg* 2025;12:1646605.
19. Wu PH, Kavishwar RA, Kim HS. A narrative review of current and future of unilateral biportal endoscopic (UBE) transforaminal lumbar interbody fusion. *Semin Spine Surg* 2024;36:101084.
20. Dai J, Liu XF, Wang QL, Peng YJ, Zhang QZ, Jiang FX, et al. A new method for establishing operative channels in unilateral biportal endoscopic surgery: Technical notes and preliminary results. *J Back Musculoskelet Rehabil* 2023;36:367-75.
21. Liu Y, Li X, Tan H, Hao X, Zhu B, Yang Y, et al. Learning curve of uniportal compared with biportal endoscopic techniques for the treatment of lumbar disc herniation. *Orthop Surg* 2025;17:513-24.
22. Yu Z, Ye C, Alhendi MA, Zhang H. Unilateral biportal endoscopy for the treatment of lumbar disc herniation. *J Vis Exp* 2023;202:e65497.
23. Lin CH, Pao JL. Minimally invasive en bloc excision of rare hemorrhagic discal cysts using unilateral biportal endoscopic technique: A report of two cases. *J Minim Invasive Spine Surg Tech* 2020;5:76-80.
24. Motten TL. Surgical outcomes of unilateral biportal endoscopy versus full endoscopy for lumbar canal stenosis: A meta-analysis. *Cureus* 2024;16:e76219.
25. Yang L, Yu T, Jiao J, Hou T, Wang Y, Zhao B, et al. Comprehensive analysis of UBE-related complications: Prevention and management strategies from 4685 patients. *Med Sci Monit* 2024;30:e944018.

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