Post-Traumatic Hemorrhagic Facet Cyst Treated through a Contralateral Uniportal Interlaminar Endoscopic Approach: Case Report

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ABSTRACT
Hemorrhagic facet synovial cysts are an uncommon cause of radicular compression. Their management has evolved toward minimally invasive techniques aimed at achieving effective decompression with lower morbidity. We report the case of a 66-year-old man who developed progressive motor deficit in the lower limbs following minor trauma. Magnetic resonance imaging revealed a facet cyst at the L3–L4 level causing spinal canal compromise. To preserve spinal stability, contralateral uniportal interlaminar endoscopic decompression was performed using the over-the-top technique. This approach minimized surgical invasiveness, allowed immediate postoperative recovery, and proved to be a safe and effective treatment option.
Keywords: Juxtafacet cyst; hemorrhagic; endoscopy.
Level of Evidence: IV

Quiste facetario hemorrágico postraumático tratado por vía endoscópica uniportal interlaminar contralateral. Reporte de un caso

RESUMEN
Los quistes sinoviales facetarios hemorrágicos son una causa infrecuente de compresión radicular, su manejo ha evolucionado hacia técnicas mínimamente invasivas, buscando una descompresión efectiva con una morbilidad menor. Se presenta el caso de un hombre de 66 años con déficit motor progresivo en los miembros inferiores tras un traumatismo menor. La resonancia magnética mostró un quiste facetario en L3-L4 que comprometía el canal medular. Para preservar la estabilidad espinal, se realizó una descompresión endoscópica uniportal interlaminar mediante la técnica “over the top” (por encima de la lámina) con un abordaje contralateral. Este procedimiento minimizó la invasividad, permitió una recuperación posoperatoria inmediata y demostró ser una opción segura y eficaz.
Palabra clave: Quiste yuxtafacetario; quiste hemorrágico; endoscopia.
Nivel de Evidencia: IV

INTRODUCTION

Facet synovial cysts are benign cystic lesions arising from the facet joint capsule and represent a potential cause of radicular or central lumbar canal compression. Their prevalence in the general population ranges from 0.65% to 6.4% and they are clearly associated with degenerative spinal disease, particularly at the L4–L5 level, where mobility and biomechanical loading are greatest.[1] Although many are incidental findings, their progressive enlargement may lead to spinal canal stenosis and neurological symptoms.

The clinical presentation becomes acute and dramatically more severe when a rare complication occurs: intracystic hemorrhage. This event, likely secondary to rupture of microvessels within the synovial membrane, causes sudden cyst expansion, resulting in cauda equina syndrome or rapidly progressive paraparesis.[2,3] Although more

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How to cite this article: Barahona W, De Zavalía M, Gobbi E. Post-Traumatic Hemorrhagic Facet Cyst Treated through a Contralateral Uniportal Interlaminar Endoscopic Approach: Case Report. *Rev Asoc Argent Ortop Traumatol* 2026;91(1):60-65. https://doi.org/10.15417/issn.1852-7434.2026.91.1.2205

than 500 cases of juxtafacet cysts have been reported, the hemorrhagic variant accounts for only approximately 10%, and its association with minor trauma as a triggering factor is exceptional, with only a limited number of cases described.[4]

The present case is unique, involving a hemorrhagic facet synovial cyst at an uncommon level (L3–L4), posing a surgical challenge due to its anatomical characteristics. It was triggered by minor trauma in a 66-year-old man who developed progressive motor deficit.

The objectives of this article are to present this exceptional case, describe its management through uniportal endoscopic decompression—a technically demanding yet minimally invasive option for this condition—and analyze the immediate postoperative course.

CLINICAL CASE

A 66-year-old man with no relevant medical, surgical, or pharmacological history presented for evaluation. His baseline functional status was excellent; he regularly practiced hiking and maintained an active lifestyle. The reason for consultation was trauma resulting from a fall from standing height that had occurred 10 days earlier. The patient developed progressive severe low back pain with radicular radiation, accompanied by weakness in the lower limbs, predominantly on the right side, which rapidly limited his ability to ambulate.

On physical examination, he reported incapacitating pain rated 10/10 on the visual analog scale. Neurological evaluation revealed significant paresis, with muscle strength graded 2/5 in bilateral ankle dorsiflexion. Deep tendon reflexes in the lower limbs were diminished.

The differential diagnoses considered included spontaneous epidural hematoma, acute sequestrated lumbar disc herniation, and complicated facet synovial cyst (with hemorrhage or inflammation). A contrast-enhanced lumbar MRI was performed, revealing a rounded cystic lesion, hyperintense on T2-weighted sequences, arising from the left L3–L4 facet joint. This lesion caused severe spinal canal compromise (greater than 80%) at that level, with marked displacement and compression of the cauda equina roots (Figure 1).

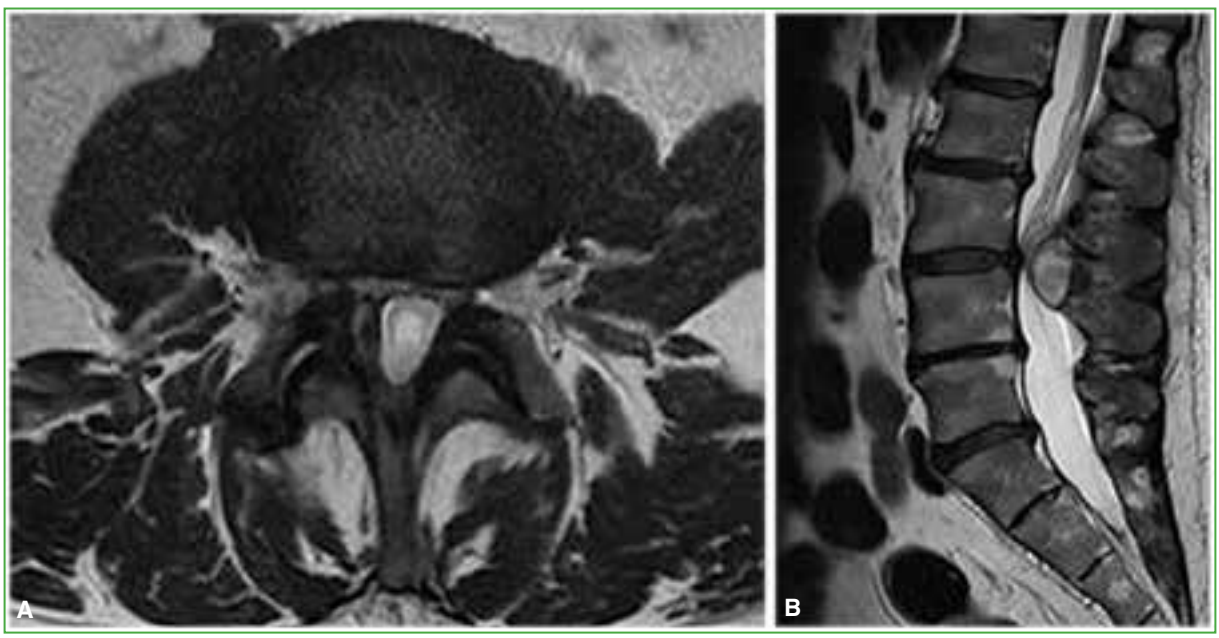

Figure 1. Magnetic resonance imaging of the lumbosacral spine, T2-weighted sequence. **A**. Axial view. **B**. Sagittal view.

The findings were consistent with a hemorrhagic juxtafacet synovial cyst. Given the acute presentation with progressive motor neurological deficit and severe radicular compression, the patient underwent urgent decompression. The objective was to relieve neural compression, reverse the motor deficit, and allow rapid functional recovery while minimizing invasiveness. A posterior interlaminar uniportal endoscopic decompression was performed using a contralateral (left-sided) approach and the "over-the-top" technique (above the dural sac) to achieve safe and complete cyst resection (Figures 2-5).

Figure 2. Intraoperative AP radiograph of the lumbar spine demonstrating the "over-the-top" technique in the L3-L4 intervertebral space.

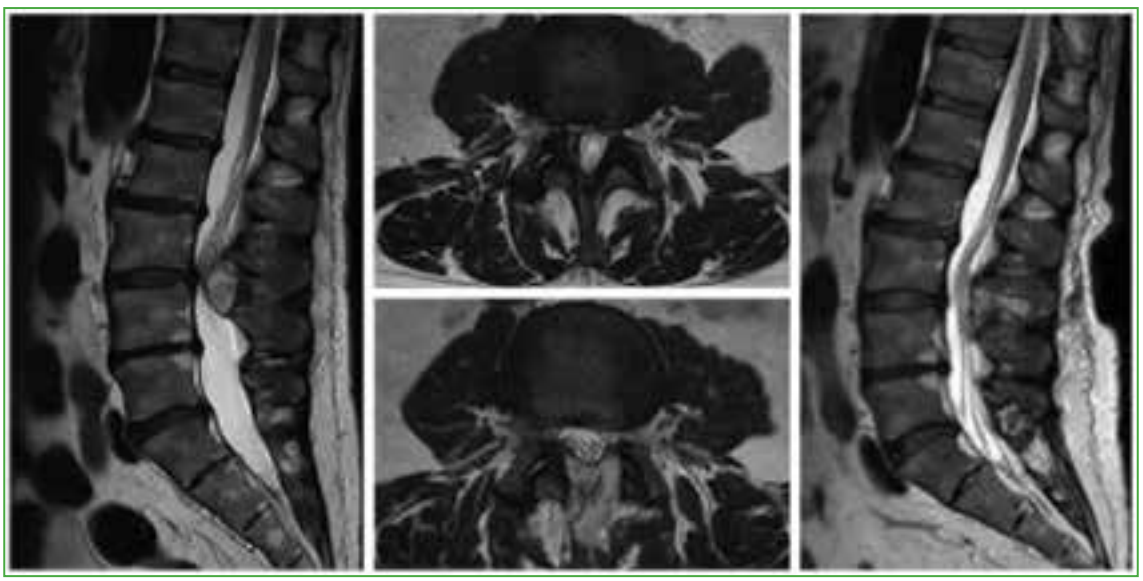

Figure 3. Magnetic resonance imaging of the lumbosacral spine, T2-weighted sequence. Sagittal and axial views. Preoperative cauda equina compression versus postoperative neural decompression.

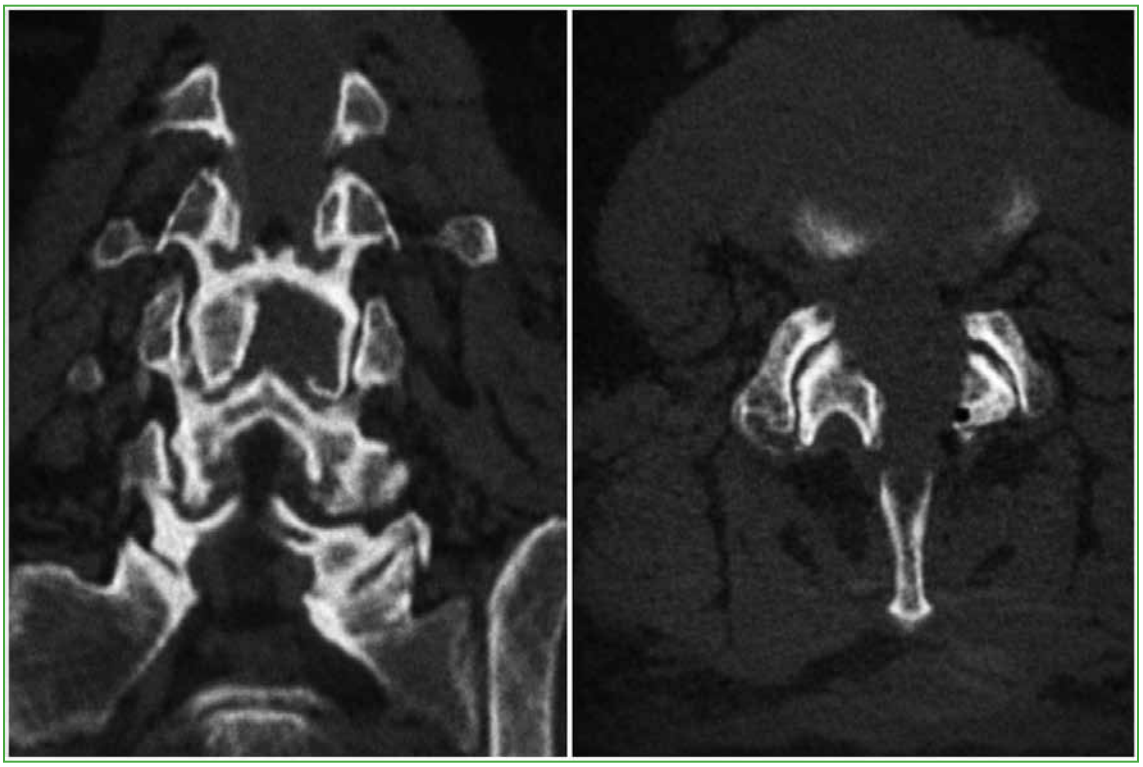

Figure 4. Computed tomography of the lumbosacral spine. Coronal and axial views demonstrating the postoperative result.

Figure 5. Soft tissues. Postoperative scar.

The procedure lasted 95 minutes. Blood loss was minimal and not quantifiable, and no intraoperative complications occurred.

The patient had a favorable immediate postoperative course. Within the first 24 hours, pain improved markedly (2/10 on the visual analog scale), and motor recovery was incipient. He was discharged 24 hours after surgery with an outpatient physical therapy program. At the 7-day follow-up, ankle dorsiflexion strength had improved to 5/5.

DISCUSSION

Our case illustrates a paradigmatic clinical presentation of a hemorrhagic juxtafacet synovial cyst: an acute and progressive motor neurological deficit triggered by minor trauma.[5] Although uncommon, this condition constitutes a surgical emergency, as neural compression requires prompt and complete decompression to prevent permanent neurological deficit;[1] therefore, the choice of surgical technique was critical.

In this context, uniportal endoscopic surgery was selected as the optimal strategy because of its unique ability to achieve radical decompression with minimal tissue disruption. Percutaneous techniques, such as aspiration or corticosteroid injections, were ruled out due to the high risk of recurrence and the solid hemorrhagic nature of the cyst, which makes such approaches ineffective.[6] Conversely, traditional open or microsurgical techniques, although effective, involve greater paraspinal muscle dissection, a higher risk of iatrogenic instability, and a longer postoperative recovery.[7,8]

The contralateral interlaminar ("over-the-top") approach was the cornerstone of our success. This technique, recommended for medial lesions and cysts at lower lumbar levels with adequate interlaminar space,[9] allowed complete cyst resection from a safe and ergonomic angle while fully preserving the integrity of the symptomatic facet joint capsule. This represents a decisive advantage over a transforaminal approach, which might have been insufficient for a cyst of this size and location, or a direct ipsilateral approach, which could have compromised facet stability on the affected side.[10]

Our results are consistent with and reinforce the emerging literature. The patient's immediate motor recovery and discharge within 48 hours exceed the average recovery reported with open techniques and align with the excellent outcomes described by Tacconi et al., in which endoscopic management achieved a 50% reduction in pain at 6 months with minimal morbidity.[5,11] Importantly, this case contributes a relevant nuance to the field of endoscopic spine surgery: it demonstrates that uniportal endoscopic decompression is not only a valid option but also an optimal strategy for the urgent management of complicated hemorrhagic cysts, achieving the same degree of neural decompression as open surgery while preserving the well-established advantages of minimally invasive techniques.

Publications from our region on the endoscopic management of this condition remain scarce, underscoring the need for larger case series and prospective studies.

CONCLUSIONS

Hemorrhagic facet synovial cysts are rare entities, likely underdiagnosed in clinical practice. Minor trauma appears to be the most common precipitating factor in acute presentations.

Among therapeutic options, endoscopic treatment offers a minimally invasive alternative to open surgery. Various endoscopic techniques can be tailored to the specific anatomical characteristics of the cyst and the patient, as illustrated in this case, allowing effective decompression with rapid postoperative recovery.

Conflict of interest: The authors declare no conflicts of interest.

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