

CLINICAL ACUTE PRESENTATION OF LUMBAR FACET JOINT GANGLIA WITH BILATERAL SCIATICA

APRESENTAÇÃO CLÍNICA AGUDA DE QUISTOS FACETÁRIOS LOMBARES COM CIATALGIA BILATERAL

PRESENTACIÓN CLÍNICA AGUDA DE QUISTES FACETARIOS LUMBARES CON DOLOR CIÁTICO BILATERAL

CARLA OLIM CASTRO¹ , ANDRÉ BARROS² , NUNO LANÇA² , LUÍS BARROSO² , JOÃO CANNAS² , JORGE MINEIRO² 

1. Centro Hospitalar e Universitário de Coimbra, Orthopedics Service, Coimbra, Portugal.

2. Hospital CUF Descobertas, Spine Unit, Lisboa, Portugal.

ABSTRACT

Facet joint ganglia are benign cystic lesions located adjacent to a facet joint. The majority is asymptomatic. However, can cause important low-back pain and radiculopathy. Neurogenic deficit, claudication, and cauda equina syndrome have also been reported. The authors report two cases of acute low back pain with bilateral sciatica, dorsal foot dysesthesia, and hallux dorsiflexion/extension deficit, due to the presence of encapsulated cysts adjacent to the facet joints causing a significant reduction of the spinal canal. Urgent surgical decompression was performed in both patients with an uneventful recovery. Symptomatic facet joint ganglia is a highly unusual cause of back pain, although it can present with acute onset of bilateral sciatica and canal stenosis requiring urgent surgical decompression. This paper highlights facet joint synovial as a differential diagnosis of lumbar pain and describes two different surgical approaches with good outcomes. **Level of Evidence IV; Case Series.**

Keywords: Synovial Cyst; Sciatica; Spine.

RESUMO

Os quistos facetários são lesões císticas benignas localizadas adjacentes a uma articulação facetária. A maioria é assintomática. No entanto, podem ser causa de importante dor lombar e radiculopatia. Estão ainda relatados casos de déficit neurogénico, claudicação e síndrome de cauda equina. Os autores apresentam dois casos de dor lombar aguda com ciatalgia bilateral, disestesia do dorso do pé e déficit na dorsiflexão/extensão do hálux, causados por uma redução significativa do canal medular devido à presença de quistos encapsulados adjacentes às articulações facetárias. Os doentes foram submetidos a descompressão cirúrgica urgente com uma excelente recuperação. Os quistos facetários sintomáticos são uma causa rara de lombalgia, porém podem apresentar-se inicialmente com um quadro agudo de ciatalgia bilateral e estenose canalar com necessidade de descompressão cirúrgica urgente. Este artigo realça os quistos facetários como diagnóstico diferencial de lombalgia e descreve duas abordagens cirúrgicas diferentes com bons resultados. **Nível de Evidência IV; Série de Casos.**

Descritores: Cisto Sinovial; Ciática; Coluna Vertebral.

RESUMEN

Los quistes facetarios son lesiones quísticas benignas situadas junto a una articulación facetaria. La mayoría es asintomática. Pero pueden causar dolor lumbar y radiculopatía importantes. También se han descrito déficit neurogénico, claudicación y síndrome de cauda equina. Los autores presentan dos casos de lumbalgia aguda con dolor ciático bilateral, disestesia del dorso del pie y déficit en la dorsiflexión/extensión del hallux, causados por una reducción significativa del canal medular debido a la presencia de quistes encapsulados adyacentes a las articulaciones facetarias. Los pacientes fueron sometidos a descompresión quirúrgica urgente con una excelente recuperación. Los quistes facetarios sintomáticos son una causa poco frecuente de lumbalgia, aunque pueden presentarse inicialmente con un cuadro agudo de dolor ciático bilateral y estenosis del canal que requiere descompresión quirúrgica urgente. Este artículo destaca los quistes facetarios como diagnóstico diferencial de la lumbalgia y describe dos abordajes quirúrgicos diferentes con buenos resultados. **Nivel de Evidencia IV; Serie de Casos.**

Descriptorios: Quiste Sinovial; Ciática; Columna Vertebral.

Study conducted by the Spine Unit, Hospital CUF Descobertas.

Correspondence: Carla Olim Castro. Praceta Professor Mota Pinto, Coimbra, Portugal. 3004561. carla2355@gmail.com



INTRODUCTION

Facet joint ganglia are a group of benign expansive cystic lesions located adjacent to a facet joint, either intracanal posterolateral to the thecal sac or extracanal.¹⁻³ Facet joint synovial cyst, ganglion, and ligamentum flavum cyst are described in the literature as varying manifestations of the same entity. Despite being histologically distinct, they have the same clinical picture, treatment, and prognosis.^{1,4-7}

The first case of radiculopathy caused by a lumbar ganglion was described in 1968 by Kao et al.,⁸ A history of progressive low-back pain, and radiculopathy are the most common presentation. However, neurogenic claudication, neurological deficit, and cauda equina compromise have also been reported.^{2,5,7,9-11}

The spinal ganglia occurred most frequently in the 6th decade of life with a slight female predominance.^{2-5,9,11,12} It can be unilateral, bilateral at a single or multilevel, and the majority are asymptomatic, incidentally found on magnetic resonance imaging (MR).^{3,4,7,12,13}

The conservative treatment has short-term or no clinical improvement so decompression and surgical excision are the preferred choices in symptomatic patients.^{2-5,9,14,15} Cauda equina syndrome caused by lumbar facet joint ganglion is extremely rare and warrants emergent surgery.^{9,16}

The authors describe 2 case reports about lumbar facet joint ganglia presented with acute bilateral sciatica and motor-sensitive deficits.

CASE REPORT

The authors presents 2 case reports with a past medical history of low back pain presenting with an acute bilateral sciatica, dorsal foot dysesthesia, and hallux dorsiflexion/extension deficit, within 3 days.

The first case is a 56 years old female with low back pain aggravated over a period of 12 hours with a bilateral foot drop, followed by right lower limb limping 24 hours later, and on the 3rd day, presented to the clinic with a trendelenburg gait.

The second, a 61 years male with worsening of low back pain over a period of 10 days and sudden aggravation within 3 days, initially with limping on the left side with progression to the involvement of both lower limbs.

On examination of the spine, both had a moderate paravertebral spasm with a painful decreased range of motion. Neurological examination showed dysesthesia to the anterolateral aspect of both legs and dorsal feet and no sphincter disturbances or perineal sensory deficits. The motor deficit was evident in the lower limbs with decreased muscle strength at the hallux and toes extensors, gluteus medius, and peroneal muscles. The tibialis anterior muscle had normal strength. (Table 1)

Both patients underwent an imaging study.

In the first case, standing lumbar x-rays showed a grade 1 spondylolisthesis at L4 -L5 (Figure 1), and an MR-myelogram demonstrated a compressive intracanal lesion, causing a secondary stenotic spinal canal at L4-5 (Figure 2). An MR was also performed that showed two large rounded encapsulated cysts adjacent to the facet joints bilaterally, causing a significant reduction of the spinal canal area with a significant compromise of the L5 nerve roots. (Figure 3)

Table 1. Motor function and reflexes examination.

	Case 1		Case 2	
	Right	Left	Right	Left
Motor Function				
Gluteus medius	1/5	5/5	3/5	3/5
Tibialis anterior	5/5	5/5	5/5	5/5
Peronei muscles	4/5	4/5	2/5	2/5
Extensor Hallux	1/5	1/5	1/5	1/5
Common toes extensors	1/5	1/5	3/5	3/5
Reflexes				
Patellar tendon	Normal	Normal	-	-
Achilles tendon	Hypo reflexive	Hypo reflexive	-	-
Babinski	Flexion	Flexion	-	-

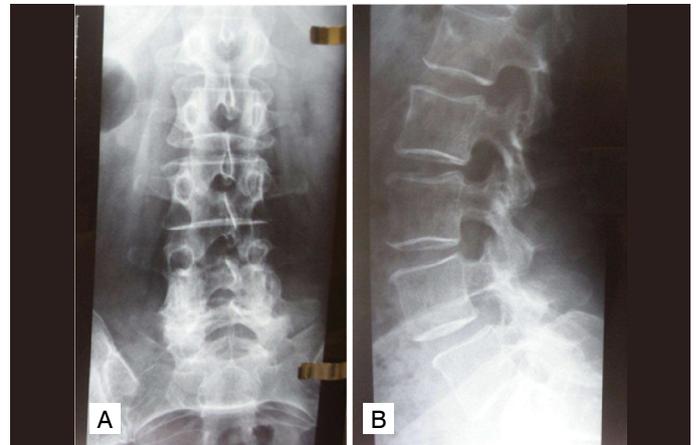


Figure 1. X-ray images of the first case. A - X-ray in AP view. B - X-ray in lateral view of a Grade 1 spondylolisthesis at L4-L5 level, without indirect signs of lumbar spinal stenosis.

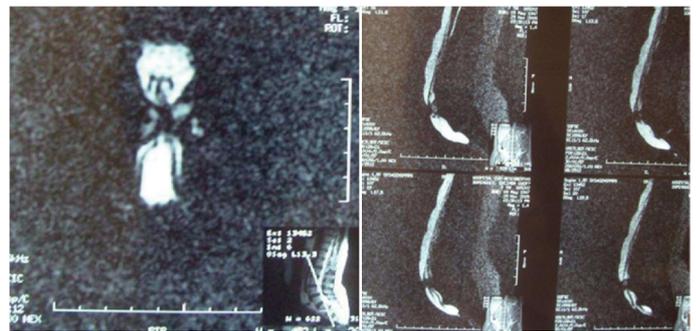


Figure 2. MR-myelogram of the first case with an spine canal lesion at L4-5 level.

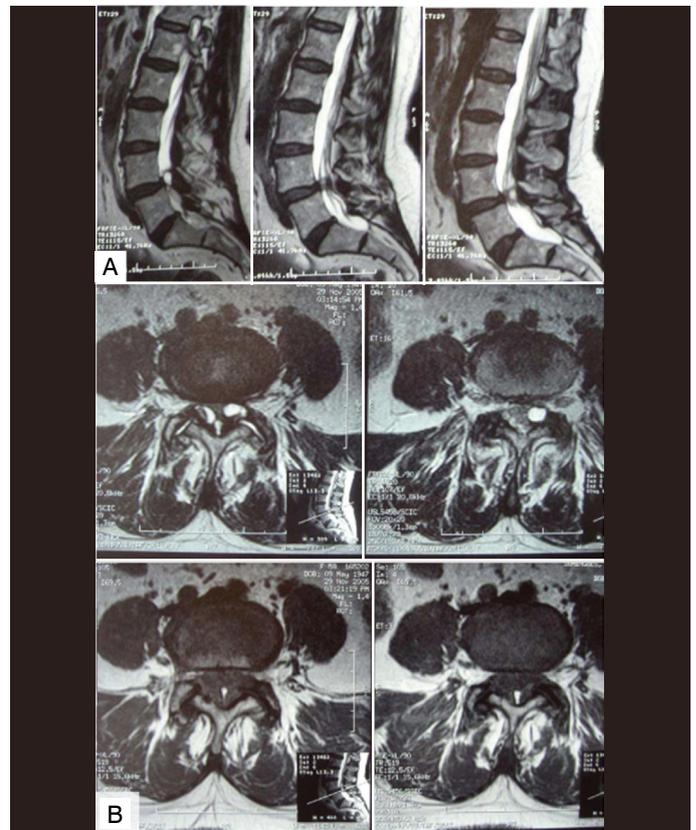


Figure 3. MR of the first case with two large cysts adjacent to the facet joints bilaterally at L4-L5 level. A - MR T2 sagittal views. B - MR T2 axial views.

In the second case, the X-ray images showed a degenerative disc disease at L3-L4, L4-L5, and L5-S1 without changes in vertebral body alignment (Figure 4). The MR showed a right-sided L3-L4 and L4-L5 foraminal disc herniation, compressing the nerve roots and a ganglion adjacent to the L4-L5 left facet joints producing acute critical canal stenosis and at L5-S1 a central disc protrusion. (Figure 5)

In the face of these clinical and imaging findings, both patients underwent surgical spinal canal decompressing and ganglia excision.

The surgical strategy in the first case was a L4 laminectomy with L3-4 and L4-5 flavectomy, with bilateral ganglia excision. Because of the segmental instability at L4-L5 shown on the pre-op radiographs and the extensive decompression, a postero-lateral instrumented L4-L5 fusion was performed. (Figure 6)

The second case was treated with L3, L4, and L5 left hemilaminectomy and hemiflavectomy, L4-L5 foraminotomy, and ganglia excision. (Figure 7)

Postoperatively, both patients presented an improvement in pain and neurologic deficit. Complete motor and sensory recovery was noted at 8 weeks in case 1 and at 5 weeks in case 2.

DISCUSSION

This pathology prevalence is not well-known. Apostolaki et al. reviewed the MR features of two MR units over a 4-year period and concluded that spinal ganglia had an incidence of approximately

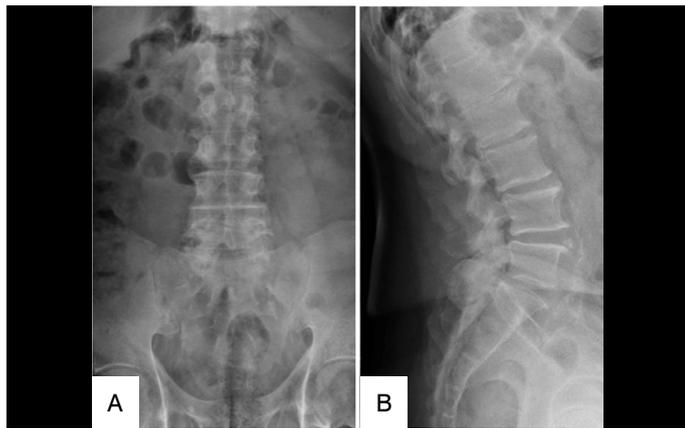


Figure 4. X-ray images of the second case. A - X-ray in AP view. B - X-ray in lateral view with degenerative disc disease at L3-L4, L4-L5, and L5-S1.

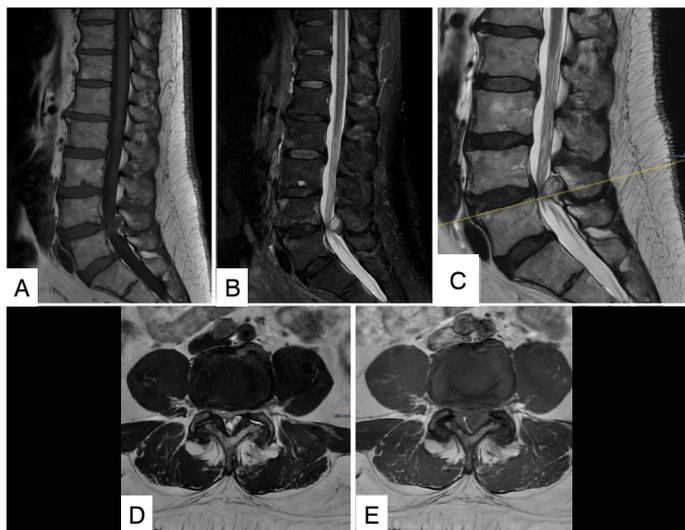


Figure 5. MR of the second case with L3-L4 and L4-L5 right foraminal disc herniation, L5-S1 central disc protrusion and a cyst adjacent to the L4-L5 left facet joints. A - T1 sagittal view, B - T2 STIR sagittal view, C - T2 sagittal view, D - T2 axial view, E - T1 axial view.

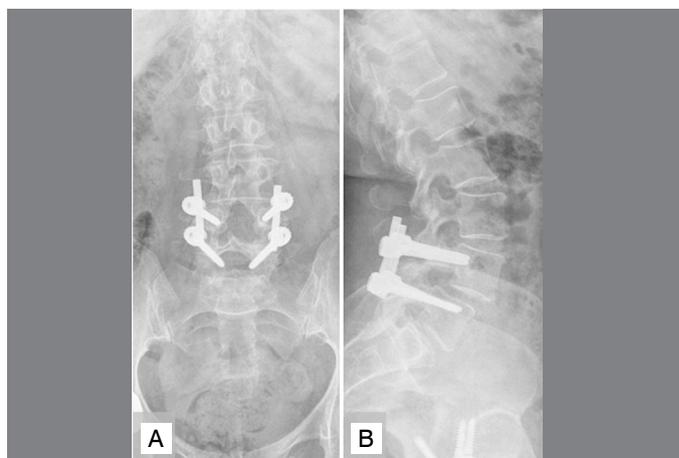


Figure 6. Pos-op X-ray of the first case - laminectomy, flavectomy, ganglia excision, and postero-lateral instrumented L4 - L5 fusion. A - X-ray in AP view. B - X-ray in lateral view.

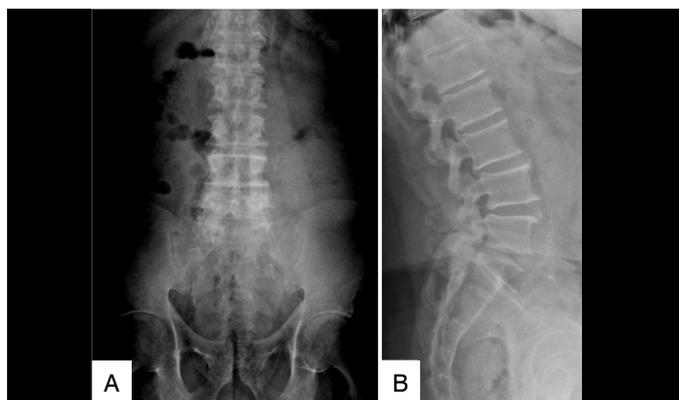


Figure 7. Pos-op X-ray of the second case – L3, L4, and L5 left hemilaminectomy, hemiflavectomy, foraminotomy and ganglia excision. A - X-ray in AP view. B - X-ray in lateral view.

0.65 %.¹² A systematic review of a patient series disclosed a 2.3% anterior lumbar facet ganglia prevalence.¹

Although it can occur in all spinal segments, the majority are found in mobile segments such as the lumbar spine, in particular at L4-L5, followed by L3-L4 and L5-S1 level, and C5-C6 or C7-T1 in cervical spine.^{2,4,5,7,9,11-13,16} Facet joint arthritis generates effusion that causes protrusion of the synovial membrane through defects in the joint capsule. In addition, segmental instability may further aggravate the extraarticular intraspinal space protrusion resulting in the neural structures compression.^{5,9-11,13,16} Spondylolisthesis associated with the facet arthropathy favors segmental instability and enforces the role of instability in the etiology of facet joint ganglia.^{1,7,9-11} Ulus et al. found a prevalence of 75% facet arthropathy and 37,5% spondylolisthesis.²

The clinical findings depend on its location, volume, and relation to neural structures.^{4,9} Nevertheless, despite the symptoms being often correlated to the side of the synovial cyst, Lyons et. al., reported that 21% of patients with large ganglia present with bilateral or contralateral symptoms.⁷

This case series describes 2 patients with acute bilateral sciatica, sudden limping, and motor weakness at the gluteus medius, peroneal muscles, hallux, and toes extensors. These clinical examination points to a bilateral L5 nerve root deficit, and we must consider it as a differential diagnosis of disc herniation, lumbar stenosis, facet joint syndrome, pathological fracture, or another intracanal lesion. This sudden onset presentation requires a prompt investigation.

Plain radiographs are useful in assessing spinal segmental instability and help to exclude other conditions, such as spondylolysis, degenerative spondylolisthesis, and metastatic lesions.⁴ MR and CT

can demonstrate the cyst relation to the dural sac and neural structures of the spinal canal.^{2-4,7,12} They are usually described as round or oval collections arising from the medial aspect of the facet joint and projecting beyond the visible margins of the joint with hypointense “inner cores” on T1-weighted MR sequences and hyperintense centers with hypointense rims on T2-weighted sequences.^{1,3,5,9,12,15,16} However an accurate MR diagnosis can be difficult because the ganglia content exhibits variable signal intensity.^{4,12} Apostolaki et al. describe four patterns of MR in their study.¹²

The imaging exams evidence an L4-L5 “acute” canal stenosis, consistent with the clinical exam. In the first case, the acute onset could be associated with intracystic hemorrhage and acute distention of the cyst in an unstable segment due to spondylolisthesis. An association between the acute distention of the cyst and acute disc herniation could be the explanation for the second case.^{11,12,15}

Although conservative treatment shows temporary improvement, some authors suggest doing it for 6 months before considering surgical options.⁴ Conservative management includes bed rest, analgesia, and physical therapy. However, a more invasive attitude can be adopted with CT-guided intra-articular corticosteroid injection, needle aspiration of cystic contents, or percutaneous rupture.^{4,5,9,14,16}

Surgical excision and decompression is the preferred treatment in symptomatic patients. However, there is no consensus, and therefore a few surgical strategies have been reported. The gold standard technique reported was laminectomy and flavectomy, although it has been associated with ganglia recurrence. Morishita et al., reported that 4.69% of the segments treated with posterior decompression surgery without fusion developed recurrent symptomatic facet joint, particularly those submitted to bilateral posterior decompression.¹³ The development of facet joint ganglia within the early postoperative period supports the instability hypothesis as the major role in the development of this pathology.^{7,9,10,13,17} The introduction of

minimally invasive techniques made it possible to overcome this problem, allowing less damage to the posterior stabilizing structures. Lalanne et al. recommended an individual evaluation to assess the segment’s instability and the need for instrumented fusion.⁹ Minimal invasive laminotomy associated with medial facetectomy should be considered the surgical therapy of choice in patients without previous instability.¹⁸⁻²⁰ On the contrary, patients with evidence of prior instability on standing radiographs are more likely to be treated with decompression and posterior instrumented spinal fusion.^{9,16}

Both patients underwent surgical treatment. A grade 1 spondylolisthesis at L4-L5 level was reported in the first case and a posterolateral instrumented fusion was performed. Still, the other patient underwent a hemilaminectomy and decompression as a stand-alone procedure.

Regarding postoperative results, both patients had an uneventful recovery, pain improvement, and neuro deficits.

CONCLUSION

To conclude, a symptomatic facet joint ganglia is a rare condition and its acute presentation is even more exceptional. When it occurs, a comprehensive objective examination should be performed in order to define possible differential diagnoses and guide subsequent investigations. MR is the imaging of choice as it allows the identification of this pathology and the associated degenerative changes that can lead to canal stenosis. Urgent surgical decompression is mandatory and the surgical technique must be individualized for each patient.

All authors declare no potential conflict of interest related to this article.

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REFERENCE

1. Doyle AJ, Merrilees M. Synovial Cysts of the Lumbar Facet Joints in a Symptomatic Population Prevalence on Magnetic Resonance Imaging. *Spine (Phila Pa 1976)*. 2004;29(8):874-8.
2. Ulus A, Altun A, Senel A. Lumbar juxtafacet cysts. *Turk Neurosurg*. 2020;30(3):416-21.
3. Splavski B, Rotim A, Brumini I, Koprek I, Gajski D, Božić B, et al. Lumbar spine synovial cyst: a case series report and review of surgical strategies. *Acta Clin Croat. NLM (Medline)*. 2019;58(3):491-6.
4. Khan AM, Girardi F. Spinal lumbar synovial cysts. Diagnosis and management challenge. *Eur Spine J*. 2006;15(8):1176-82.
5. Rana S, Pradhan A, Casasos J, Mozaffari K, Ghodrati F, Sugimoto B, et al. Lumbar spinal ganglion cyst: A systematic review with case illustration. *J Neurol Sci*. 2023;445:120539.
6. Khalatbari K, Ansari H. MRI of degenerative cysts of the lumbar spine. *Clin Radiol*. 2008;63(3):322-8.
7. Lyons MK, Atkinson JLD, Wharen RE, Gordon Deen H, Zimmerman RS, Lemens SM. Surgical evaluation and management of lumbar synovial cysts: the Mayo Clinic experience. *J Neurosurg*. 2000;93(1 Suppl):53-7.
8. Kao CC, Uihlein A, Bickel WH, Soule EH. Lumbar Intraspinial Extradural Ganglion Cyst. *J Neurosurg*. 1968;29(2):168-72.
9. Lalanne LB, Carmona RL, Cirillo Totera JI, Lemos FA, Wilson JTM, Beaulieu Montoya AM. Surgically managed symptomatic intraspinal lumbar facet synovial cyst outcome of surgical treatment with resection and instrumented posterolateral fusion, a case series. *BMC Surg*. 2022;22(1):277.
10. Rosenstock T, Vajkoczy P. New classification of facet joint synovial cysts. *Acta Neurochir (Wien)*. 2020;162(4):929-36.
11. Boviatisis EJ, Staurinou LC, Kouyialis AT, Gavra MM, Staurinou PC, Themistokleous M, et al. Spinal synovial cysts: Pathogenesis, diagnosis and surgical treatment in a series of seven cases and literature review. *Eur Spine J*. 2008;17(6):831-7.
12. Apostolaki E, Davies AM, Evans N, Cassar-Pullicino VN. MR imaging of lumbar facet joint synovial cysts. *Eur Radiol*. 2000;10(4):615-23.
13. Morishita Y, Taniguchi R, Kawano O, Maeda T. Synovial facet joint cysts after lumbar posterior decompression surgery. *J Neurosurg Spine*. 2021;35(6):704-9.
14. Métellus P, Fuentes S, Adetchessi T, Levrier O, Flores-Parra I, Talianu D, et al. Retrospective study of 77 patients harbouring lumbar synovial cysts: Functional and neurological outcome. *Acta Neurochir (Wien)*. 2006;148(1):47-54.
15. Yarde WL, Arnold PM, Kepes JJ, O’boynick PL, Wilkinson SB, Batnitzky S. Synovial Cysts of The Lumbar Spine: Diagnosis, Surgical Management, and Pathogenesis Report of Eight Cases. *Surg Neurol*. 1995;43(5):459-64.
16. Boody BS, Savage JW. Evaluation and treatment of lumbar facet cysts. *Journal of the American Academy of Orthopaedic Surgeons*. Lippincott Williams and Wilkins; 2016. p. 829-42.
17. Ikuta K, Tono O, Oga M. Prevalence and clinical features of intraspinal facet cysts after decompression surgery for lumbar spinal stenosis: Clinical article. *J Neurosurg Spine*. 2009;10(6):617-22.
18. Denis DR, Hirt D, Shah S, Lu DC, Holly LT. Minimally invasive surgery for lumbar synovial cysts with coexisting degenerative spondylolisthesis. *Int J Spine Surg*. 2016;10:37.
19. Bruder M, Cattani A, Gessler F, Droste C, Setzer M, Seifert V, et al. Synovial cysts of the spine: Long-term follow-up after surgical treatment of 141 cases in a single-center series and comprehensive literature review of 2900 degenerative spinal cysts. *J Neurosurg Spine*. 2017;27(3):256-67.
20. Trummer M, Flaschka G, Tillich M, Homann CN, Unger F, Eustacchio S. Diagnosis and surgical management of intraspinal synovial cysts: report of 19 cases. *J Neurol Neurosurg Psychiatry*. 2001;70(1):74-7.