

Hemorrhagic Lumbar Synovial Cyst after Microscopic Discectomy

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Intraspinal synovial cysts are rare but they are being documented with increasing frequency due to improvements in radiological imaging. However, hemorrhage into synovial cysts is uncommon, and affected patients may present with acute onset radiculopathy. This type of hemorrhage is known to result from rupture of fragile neoangiogenic vessels in the cyst wall, due to a traumatic event or anticoagulant therapy. Here, the authors present a rare case of hemorrhagic lumbar synovial cyst caused by spinal instability after microscopic discectomy. To the best of the authors' knowledge, this is the first report of hemorrhagic lumbar synovial cyst caused by spinal instability following microscopic discectomy in the absence of a traumatic event or anticoagulant therapy. We discuss the pathophysiological mechanism of this uncommon entity and provide a review of the literature.

Key Words: Lumbar, Cyst, Discectomy

INTRODUCTION

Symptomatic hemorrhagic lumbar facet cyst is a rare condition, and few cases have been reported⁶⁾. Although its precise cause and pathogenesis are debatable, it is believed that bleeding into a synovial cyst results in acute increases in pain and radicular symptoms, including neurological deficits^{1,8)}. In most cases, a hemorrhagic presentation could be caused by anticoagulation therapy, trauma, or vascular anomaly⁴⁾. Here, we present a case of hemorrhagic lumbar facet cyst caused by spinal instability after microscopic discectomy in the absence of such predisposing conditions.

CASE REPORT

A 56-year-old woman experienced disabling back and left leg pain for 3 months before surgery. Radiological studies, including simple radiographs with flexion and extension views and magnetic resonance (MR) images revealed lumbar disc herniation at the L4-5 level without instability (Fig. 1). She underwent L4-5 microscopic discectomy following bilateral laminotomy to reduce the extent of laminectomy. After surgery, her presenting symptoms were much improved and she was discharged without pain. However, at 6 months after surgery, the patient complained of sudden onset pain radiating to left thigh and numbness of the left leg. A neurologic examination conducted at the

time revealed no neurologic deficits, and bowel and bladder function were normal. However, the straight leg raising test elicited pain the left leg at 45°, which was exacerbated by ankle dorsiflexion. Under a preliminary diagnosis of recurrent disc herniation, simple radiographs and MR images were obtained. Dynamic flexion and extension views revealed progression of instability at the L4-5 level and MR images showed the presence of a cystic formation in the left L4-5 facet joint with arthritis compressing the left L5 root and dural sac. In addition, MRI displayed a hypointense abnormality on T1-weighted images and a corresponding hyperintense abnormality on T2-weighted images, which was consistent with hemorrhage (Fig. 2). Surgical excision was performed 3 days after readmission with posterior lumbar interbody fusion using pedicle screws due to the subsequent instability. The lesion adhered slightly to dura mater, and contained old coagulated dark-brown blood. Histologic examination of the surgical specimen revealed a cystic wall composed of fibrous connective tissue containing an old hematoma with hemosiderin deposits (Fig. 3). After surgery, her symptoms immediately faded and at last follow-up (9 months after revision surgery), no symptom recurrence or neurologic aggravation was evident.

DISCUSSION

Cysts around the facet joints are called juxta-facet cysts and include synovial and ganglion

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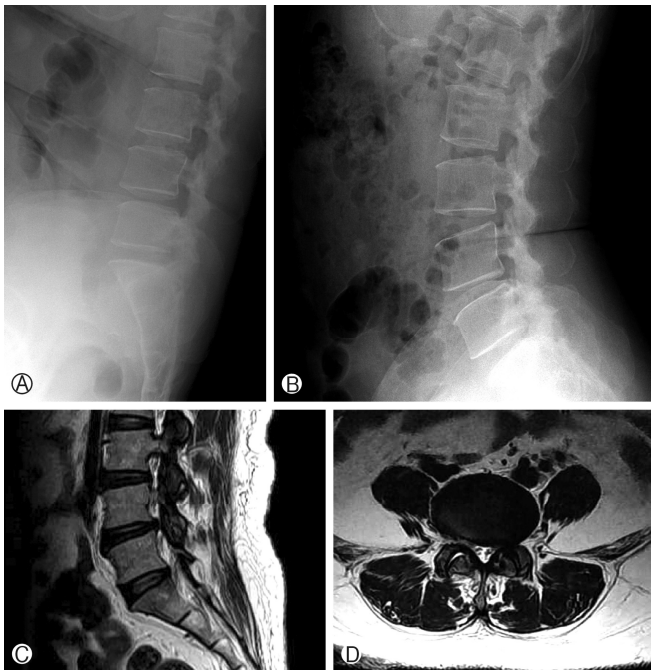


Fig. 1. Preoperative simple flexion and extension views (A, B) and T2-weighted magnetic resonance images (C, D) show disc herniation at the L4-5 level without instability.

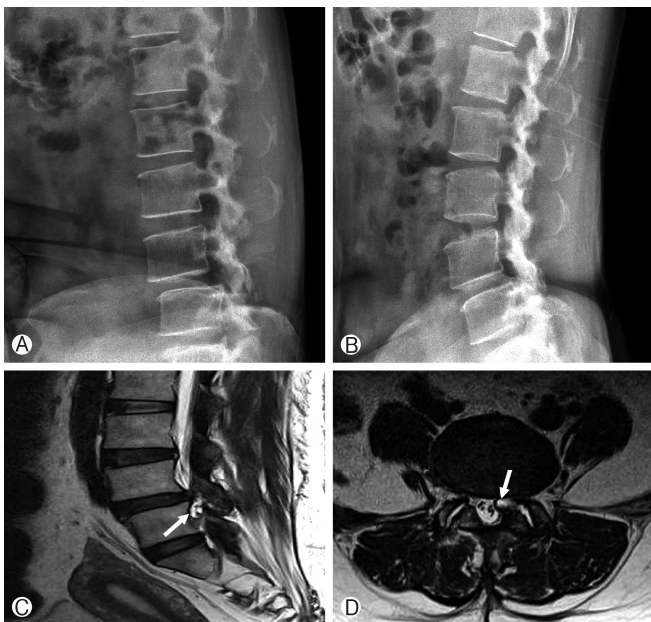


Fig. 2. At 6 months after microscopic discectomy, simple flexion and extension views (A, B) and T2-weighted magnetic resonance images (C, D) revealed instability at the L4-5 level and a hypointense cystic mass (arrows) compressing the L5 root and the dural sac.

cysts⁵). In particular, synovial cysts are believed to develop from degenerative joint disease and to represent herniations of joint synovium; generally, they contain clear, serous fluid. Usually,

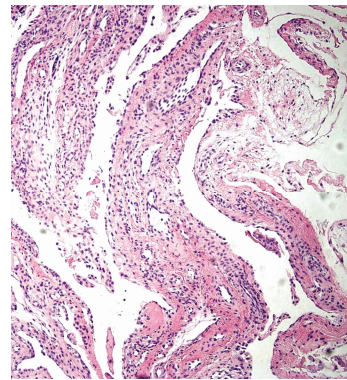


Fig. 3. Histological appearance of the hemorrhagic synovial cyst showing fibroconnective tissue and hemosiderin microdeposit (H&E, ×100).

a lumbar juxtafacet cyst remains asymptomatic for years until it gradually reaches a size capable of causing root radiculopathy or myelopathy. Rapid expansion of a synovial cyst causing severe symptoms is rare⁵). However, spontaneous bleeding into a cyst could uncommonly exacerbate symptoms. Trauma, manipulative therapy, and anticoagulation therapy have been reported to precipitate hemorrhage on several occasions^{2,3,7}).

The pathogenesis of intracystic bleeding has not been elucidated, but the formation of vascular neoendothelium has been observed in synovial cysts, and synovium itself is a vascular rich tissue. Neovascularization might be due to the production and release of angiogenic factors into a cyst under inflammatory circumstances. In fact, rupture of these fragile newly formed vessels results in acute bleeding even in the absence of a significant traumatic event^{6,10}). In our patient, microscopic discectomy following bilateral laminotomy might have caused postoperative spinal instability. Furthermore, ligamentum flavum might have been removed during decompression surgery, and consequent weakening of the medial portion of the facet joint may have allowed the joint capsule to protrude into the spinal canal. In addition, mechanical stress, such as, segmental spinal instability at the involved vertebral level, might aggravate joint capsule protrusion. Moreover, a high level of cyst vascularization could cause hemorrhage despite micromotion or mild spinal instability. Accordingly, synovial cyst hemorrhage may occur despite the absence of evident traumatic event or coagulopathy⁹). MRI is considered a good diagnostic modality, although in case of bleeding, MR images vary and are dependent on the biochemical evolution of the hematoma. As a hematoma ages, hemoglobin passes through several forms from oxyhemoglobin and methemoglobin prior to red cell lysis and its breakdown into ferritin and hemosiderin. We report a case in which hemorrhage into a L4-5 facet synovial cyst caused by spinal instability after microscopic discectomy in the absence of any trauma or coagulopathy caused radiculopathy. Surgical excision with decompression is the primary treatment for symptomatic lumbar hemorrhagic synovial cysts.

CONCLUSION

Although rare, a hemorrhagic lumbar facet cyst should be considered an uncommon complication after microscopic discectomy

following bilateral laminotomy. Surgical removal is the treatment of choice for hemorrhagic lumbar facet cysts.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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