

Recurrent Symptoms in Lumbar Disc Herniation with Concomitant Schwannoma: The Role of Tumor Microenvironment and Anti-Inflammatory Therapy

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Learning Point of the Article:

Schwannoma, a nerve sheath tumor, having inflammatory micro environment, can produce symptoms mimicking prolapsed intervertebral disc, on stopping anti-inflammatory medications. The coexistence of nerve sheath tumor and prolapsed disc at same level will make confusion in the management.

Abstract

Introduction: Lumbar intervertebral disc herniation commonly causes back pain and radiculopathy, but its coexistence with paravertebral tumors is rare. Nerve sheath tumors are the most frequent, yet their simultaneous occurrence with disc herniation producing similar symptoms is uncommon. Such cases are diagnostically and therapeutically challenging, as overlapping features may obscure the pathology and delay treatment.

Case Report: This is a rare case of a 33-year-old male presenting with low back pain and bilateral radiculopathy, left greater than right, for 1 month with positive straight leg raising test. Magnetic resonance imaging revealed an L5-S1 central disc herniation with an additional left paravertebral soft-tissue mass. Due to persistence and worsening of symptoms, even after conservative trial, he underwent endoscopic discectomy, and he had good relief of radicular pain. Postoperatively, after discontinuation of non-steroidal anti-inflammatory drugs, he developed left loin pain radiating to the thigh with tenderness at left loin. Excision biopsy of the mass confirmed a schwannoma. Following surgery, his symptoms improved markedly.

Conclusion: Sciatica may arise from lumbar disc herniation or from nerve sheath tumors, including intramuscular schwannomas. Schwannomas comprise multiple cellular elements – such as Schwann cells, axons, and macrophages – that create a complex “tumor microenvironment.” The dynamic interactions within this microenvironment play a key role in the development of symptoms. Anti-inflammatory agents can transiently suppress these processes; however, symptom recurrence, including back pain and radiculopathy, is often observed after their discontinuation.

Keywords: Schwannoma, tumor microenvironment, anti-inflammatory medication.

Introduction

Lumbar disc herniation is one of the most frequent causes of radiculopathy and low back pain in adults. In contrast, spinal schwannomas are benign peripheral nerve sheath tumors, accounting for approximately 25–30% of all spinal tumors [1].

The simultaneous occurrence of lumbar disc herniation and schwannoma is extremely rare but clinically important because both can present with overlapping symptoms such as back pain and radiculopathy [2].

The tumor microenvironment (TME) of schwannomas is now

Author's Photo Gallery



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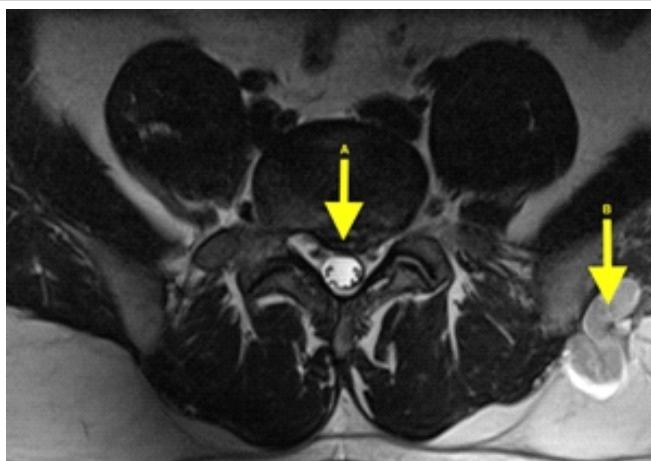


Figure 1: Pre-operative magnetic resonance imaging (T2): Showing (a) central disc bulge compressing the canal and nerve roots. (b) Soft-tissue mass.

recognized to contain inflammatory and immune cells that can influence tumor behavior and symptomatology [3]. Inflammatory mediators within the TME can exacerbate nerve irritation and mimic symptoms of disc herniation [4]. This case illustrates a unique clinical interaction between an L5-S1 disc herniation and a paraspinal schwannoma, where inflammatory changes around the tumor contributed to recurrent radiculopathy after discontinuation of anti-inflammatory therapy.

Case Report

A 33-year-old male presented with low back pain and bilateral radiculopathy, left more than right, for 1 month. There was numbness over the left lower limb for 15 days, with no history of trauma. On examination, there was paraspinal muscle tenderness at the lumbar region. Straight leg raising test (SLRT) was 30° on the left and 60° on the right. There were no sensory or motor deficits.

X-ray of the lumbosacral spine was normal. Magnetic resonance imaging (MRI) revealed an L5-S1 central disc bulge with a left paraspinal soft-tissue mass (Fig. 1). The patient was treated conservatively for 10 days with physiotherapy and medications (including non-steroidal anti-inflammatory drugs [NSAIDs]), but pain persisted and radicular symptoms worsened.

Endoscopic decompression of the prolapsed disc was performed, addressing only the disc bulge. The mass was not disturbed as it was non-tender and asymptomatic, lying away from the operative field. The patient had marked pain relief in the immediate post-operative period.

However, after discontinuation of NSAIDs, he developed progressive left loin pain radiating to the left thigh, with localized tenderness at the left paraspinal region. SLRT again became painful on the left side, though neurological

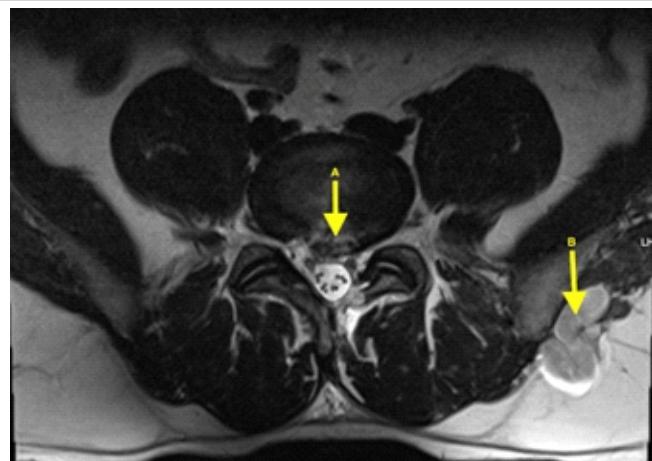


Figure 2: Magnetic resonance imaging (T2) (post-discectomy): Showing (a) Area of discectomy with decompressed canal. (b) Soft-tissue tumor.

examination remained normal.

A repeat MRI showed no recurrent disc herniation but revealed inflammatory changes surrounding the previously noted paraspinal mass (Fig. 2). Surgical excision of the mass was done. Intraoperatively, inflammatory adhesions were noted around the lesion. Histopathological examination confirmed a benign schwannoma. Post-excision, the patient had complete and sustained pain relief. Biopsy revealed capsulated nodules of spindle cell neoplasm showing cellular and hypocellular areas with foci of Verocay bodies. The cells have spindle nuclei and mitosis is not seen (Fig. 3). The small nodule showed lymph node with reactive lymphoid hyperplasia.

Discussion

The coexistence of lumbar disc herniation and schwannoma is

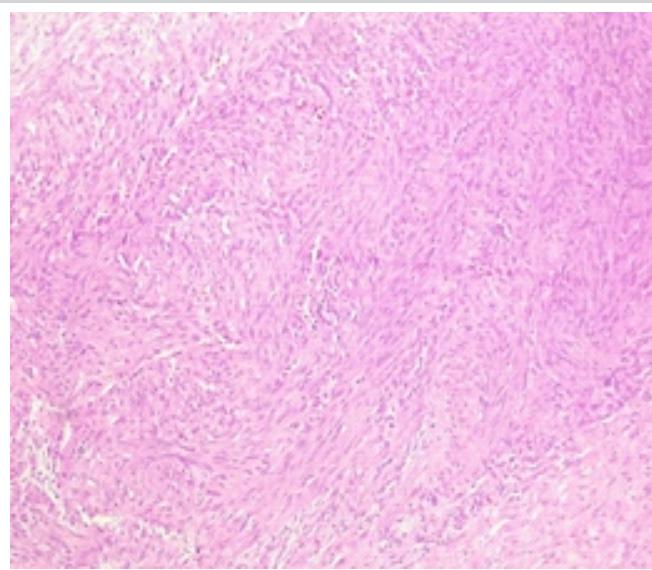


Figure 3: Histopathology showing, ANTONY a area, containing spindle cells with elongated nuclei, in palisading pattern.

exceedingly rare, with only isolated case reports documented in literature [2, 5]. Their clinical overlap may delay diagnosis since both can present with back pain, radiculopathy, and tenderness [6].

In this case, initial symptoms were primarily due to the L5-S1 central disc herniation, and the incidental paraspinal mass (later proven to be a schwannoma) was asymptomatic. The remarkable recurrence of pain after NSAID discontinuation, despite an intact discectomy site, suggested an inflammatory trigger related to the tumor.

Emerging research indicates that schwannomas are not merely collections of Schwann cells, but contain a dynamic TME composed of fibroblasts, macrophages, mast cells, and inflammatory cytokines [3, 7]. These immune elements can induce local inflammation and peritumoral edema, contributing to pain and neurological symptoms even in benign lesions [8].

Anti-inflammatory therapy, such as NSAIDs or corticosteroids, can transiently suppress cytokine-mediated inflammation within the TME, thereby alleviating symptoms [9]. In this patient, the post-operative pain-free interval corresponded to the period of NSAID use. Symptom recurrence after stopping NSAIDs likely reflected reactivation of inflammatory processes surrounding the schwannoma.

Surgical excision remains the definitive treatment for symptomatic schwannomas [10]. The complete resolution of

symptoms following tumor removal supports the hypothesis that inflammatory activity within or around the schwannoma, rather than mechanical compression alone, played a significant role in the clinical presentation.

Conclusion

This case underscores the importance of considering nerve sheath tumors in patients with recurrent or atypical radicular symptoms following lumbar disc surgery. The TME and associated inflammatory response may significantly influence symptom development. Early recognition and excision of the schwannoma led to complete pain relief. Anti-inflammatory therapy, while providing temporary benefit, may mask underlying tumor-related inflammation and delay diagnosis.

Clinical Message

Schwannomas are benign tumors that arise from nerve sheath, and they can indeed mimic symptoms of a prolapsed intervertebral disc, such as radiculopathy. The tumor location and growth can compress the adjacent nerve roots, leading to similar symptoms.

The presence of a TME in schwannoma can lead to inflammation, which may respond to anti-inflammatory medications, temporarily alleviating symptoms. However, this can also lead to delayed diagnosis, as the symptoms may be misattributed to a more common condition like a herniated disc.

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

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