Intraspinal Epidermoid Cyst Presenting with Fever: A Case Report

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ABSTRACT

A retrospective analysis was conducted on the diagnostic and therapeutic processes of a case involving an intraspinal epidermoid cyst, with a three-year postoperative follow-up. The patient's initial symptom was fever, which was later accompanied by headache, back pain, lower extremity weakness, and dysuria. Surgical excision of the lesion was performed. Histopathological examination confirmed the diagnosis of an epidermoid cyst. Postoperatively, the patient showed recovery of muscle strength in the lower extremities and resolution of urinary difficulties, with no cyst recurrence observed during the three-year follow-up. This case report reviews relevant literature to provide reference material for the diagnosis and treatment of intradural epidermoid cysts.

Key Words: *Fever, Intraspinal, Epidermoid cyst, Surgical excision, Case report*.

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INTRODUCTION

Intraspinal epidermoid cysts are rare among intraspinal tumours, with even fewer cases presenting with fever as an initial symptom. This rarity complicates clinical differentiation from Guillain-Barre syndrome, intraspinal infections, spinal tuberculosis, and other conditions. Intraspinal epidermoid cysts, as ectopic spinal cord tumours, can appear at any level within the spinal canal, though they are most frequently found in the lumbosacral region.[1] These cysts are classified into two types: Congenital and acquired. Congenital epidermoid cysts arise from the ectopic development of embryonic ectodermal tissue, while acquired cysts often result from trauma or lumbar puncture, which introduces epithelial cells into the spinal canal, leading to tumour formation.[2] Currently, routine examinations, such as MRI, lack specificity, making pathological examination essential for diagnosis.

CASE REPORT

A 47-year male patient presented with an intermittent fever that had started one month prior, with the highest recorded temperature reaching 39°C. The fever was accompanied by headache, but no dizziness, nausea, vomiting, cough, sputum production, or haemoptysis. During out-of-hospital treatment, the patient developed severe lumbosacral pain, right lower limb pain, weakness, difficulty in walking, and urinary issues. Enhanced CT and MRI were performed, suggesting a possible intraspinal tumour and surgical treatment was recommended at the local hospital. After a slight improvement in fever and headache symptoms, the patient was referred to our hospital.

Upon physical examination, the patient's temperature was 37.0°C, with no signs of meningeal irritation. A physiological curvature of the spine was noted, with no scoliosis, kyphosis, or signs of lumbosacral collapse. Both the straight leg raise test and the four-sign test were negative bilaterally. There was no significant muscle atrophy in the lower extremities. Muscle strength testing revealed grade III+ for dorsal extension and grade III for plantar flexion in the right foot. Sensory examination showed reduced sensation on the lateral aspect of the right dorsal foot, with a diminished Achilles reflex on the right side. Bilateral patellar and ankle clonus tests were negative. Muscle tone in both lower limbs was normal, with no pathological signs detected. The patient's medical history was negative for any lumbar puncture procedures. The x-rays showed no obvious abnormalities. Enhanced MR imaging revealed a neoplastic lesion in the sacral canal (Figure 1A-C). CT scans indicated abnormal density shadows, approximately 4.1 × 1.6 cm, at the level of the sacral 1 and 2 vertebrae, with calcified edges observed (Figure 2A-C). Haematological analysis showed a neutrophil ratio of 79.5% (reference range: 40-75%) and C-reactive protein (CRP) of 16 mg/L (reference range: 0-10 mg/L). No abnormalities were found in the tumour markers' panel, and no significant abnormalities were observed in other auxiliary tests.

The operation was performed under a microscope. Following the decompression of the entire laminae, dural distention was noted. The dura was incised with a sharp blade, revealing

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yellow, sticky secretions within the spinal canal (Figure 3A). Using a nerve stripper, the tumour within the spinal canal was carefully exposed and separated. The cyst wall was carefully dissected, and the affected tissue was fully excised. The surgical site was isolated and irrigated with over 5000 mL of normal saline, and the dura was repaired with micro-sutures to ensure no cerebrospinal fluid leakage. The wound was flushed with normal saline to achieve complete haemostasis, and the incision was closed. A drain was placed and maintained until drainage fluid was no longer evident. No bacterial growth was detected from bacterial cultures. Routine pathological examination confirmed the presence of epidermoid cysts (Figure 3B–F). Postoperative CT confirmed appropriate decompression of the spinal canal (Figure 2D–F), while MRI follow-up showed no residual mass within the spinal canal (Figure 1D–F). Postoperative care included anti-infection measures, fluid rehydration, and rehabilitation therapy.

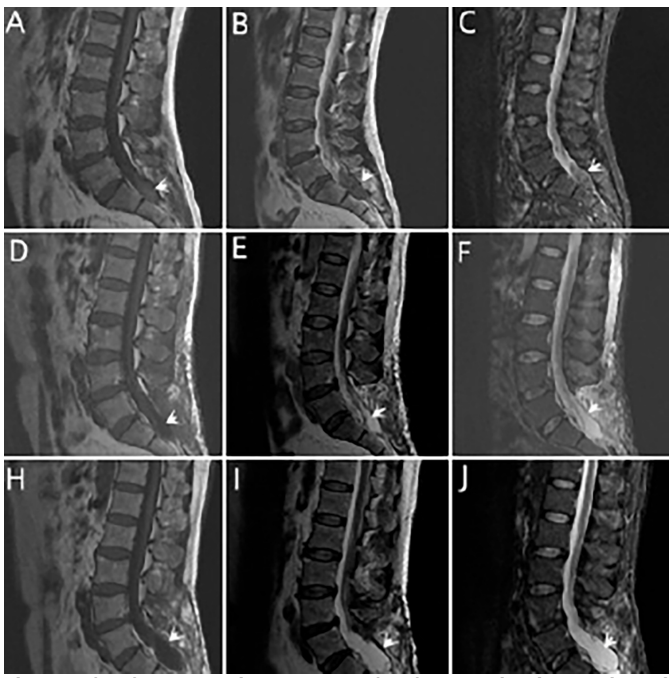

Figure 1: (A–C) Preoperative MRI scans, (D–F) MRI evaluation conducted one week post-surgery, (H–J) MRI re-assessment performed one year after the operation.

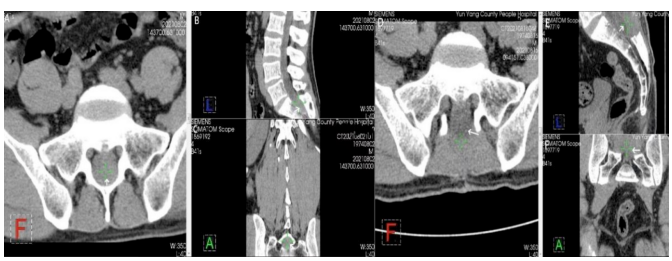

Figure 2: (A–C) Preoperative CT scans, (D–F) CT evaluation carried out one week post-surgery.

After surgery, the patient's headache and fever subsided, with restoration of normal urine and bowel function. The patient reported no significant lower back pain or right lower limb pain, and muscle strength and sensation in the right lower limb returned to normal. During a three-year follow-up, the patient showed good recovery, with no recurrence of fever, headache, sphincter dysfunction, or symptoms such as lower limb numbness or fatigue. MRI follow-up one year postoperatively (Figure 1H–J) confirmed no tumour recurrence. During a telephone follow-up after three years, the patient reported no pain or numbness in the lower limbs and no abnormalities in urine or bowel movements.

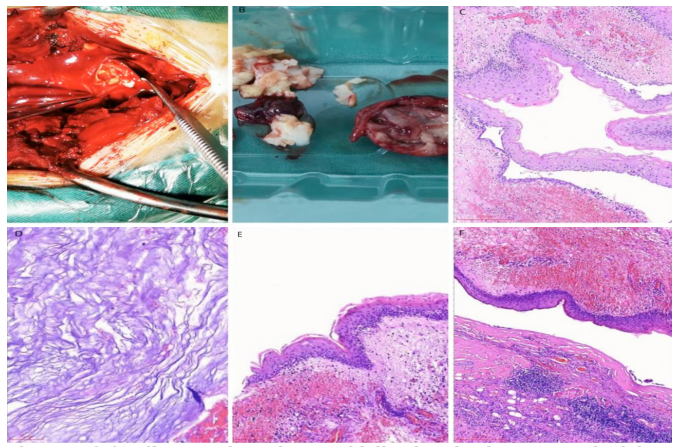

Figure 3: (A) Yellow exudate observed following the dura matter incision, (B) Post-tumour excision state, (C–F) Postoperative pathological examination findings.

DISCUSSION

Intraspinal epidermoid cysts are relatively rare, comprising approximately 1 - 2% of intraspinal tumours.[1,3] The presented patient denied a previous history of lumbar puncture, thus excluding the acquired lesions, and there was no conclusive evidence of the congenital origin as well. CT scans have a high rate of misdiagnosis for intraspinal tumours, often leading to missed diagnoses. Calcification may be present in some cases.[4] MRI holds significant value in diagnosing intraspinal epidermoid cysts; however, due to the mixed composition of these lesions, signal intensity can vary widely. On T1-weighted images (T1WI), signals can range from uniformly low to low mixed, or high-low mixed. T2-weighted images (T2WI) may show uniformly high or high--mixed signals. Despite its diagnostic utility, MRI lacks specificity, and accurate preoperative diagnosis relies on pathological examination. Because epidermoid cysts lack blood supply, enhanced imaging shows no enhancement within the lesion, although linear enhancement may appear around the lesion, potentially due to reactive inflammation in surrounding tissues.[5] Clinically, symptoms can include pain, urinary incontinence, or faecal incontinence.[6]

Epidermoid cysts are characterised by a cyst wall filled with desquamated epithelial cells, which appear similar to crumbly tofu.[7] Complete excision is the standard treatment. Studies suggest that poor prognosis is associated with factors such as tumour size exceeding 4 cm, subtotal resec-

tion, and sphincter dysfunction.[7] However, the surgical approach can present challenges. Complete excision, while desirable, can lead to postoperative complications such as severe lower limb symptoms or urinary and faecal dysfunction. Conversely, incomplete excision raises the risk of recurrence.[6,8] A second surgery can be particularly difficult due to anatomical changes and tissue adhesions.[6] In this case, a complete resection of the cyst wall tissue was performed. Postoperatively, the patient initially experienced difficulty with independent urination following catheter removal. After several attempts, independent urination was restored. Although the patient did not experience bowel dysfunction or neurological impairment in the lower limbs, safeguarding neurological function remains critical in such cases.

For encapsulated extradural tumours with clear boundaries from surrounding neural tissues, it is possible to respect the cyst wall. However, when an intradural cyst is densely adherent to the spinal cord and nerve roots, attempts to separate it can risk injury to these structures. In such cases, an intracystic excision is recommended, leaving behind portions that are tightly adherent to the nerve roots. If complete resection is not feasible, radiotherapy is effective in reducing recurrence rates.[6,8] When scraping or aspirating cyst contents, it is essential to isolate the affected tissue using cotton swabs or gelatin sponges to prevent cyst material from entering the subarachnoid space, which could lead to aseptic meningitis.[9]

Intraspinal tumours often necessitate a laminectomy, which can weaken the posterior ligament complex. Laminoplasty or pedicle screw fixation is usually required to maintain spinal stability. In this case, pedicle screws were not used due to intraoperative protection of the facet joints, preoperative and intraoperative considerations of possible infection, and adequate sacral stability. The subdural space should be thoroughly rinsed with large volumes of normal saline postoperatively. Although preoperative MRI in this case did not show prominent signs of inflammation, yellow viscous secretions were observed during surgery. Postoperative bacterial cultures were negative. The patient's symptoms of headache and fever suggest a strong likelihood of chemical aseptic meningitis.[10] This surgery must be conducted under microscopic guidance to avoid injury to healthy neural tissues and the dura mater while maximising resection of the pathological tissue. Postoperative closure of the dura mater must be rigorous to prevent cerebrospinal fluid leakage and subsequent infection.

In conclusion, with the widespread use of MRI, the detection rate of intradural epidermoid cysts has increased. However, cases presenting with fever and headache as initial symptoms are frequently misdiagnosed or experience delayed diagnosis. Therefore, heightened awareness of the condition is essential for its early and accurate diagnosis.

PATIENT'S CONSENT:
The publication of this case and accompanying images has been approved by the patient in writing.

COMPETING INTEREST:
The authors declared no conflict of interest.

AUTHORS' CONTRIBUTION:
MJL: Data curation and drafting of the manuscript.
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JZ: Proofreading, supervision, and data collection.
JSY: Manuscript design and revision.
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