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Case Report

Intradural iatrogenic epidermoid cyst at cauda equina: A case report

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ABSTRACT

Background: Spinal epidermoid accounts for <1% of all primary spinal cord tumors. They occur due to the invagination of epidermal elements into the neural tube during the embryonic period. Even more infrequent are spinal epidermoid cysts that occur without attendant spinal dysraphism (e.g., as occurs with the iatrogenic inoculation of epithelial cells in the subarachnoid space following a lumbar puncture).

Case Description: A 38-year-old female with a history of epidural spinal blocks at L2-3 for two previous pregnancies presented with low back pain, right lower extremity weakness (4/5 level), hyporeflexia, and tingling/numbness in the right L3-5 distribution. The lumbar MR demonstrated an intradural extramedullary lesion at the L2-L3 level that compressed the cauda equina/nerve roots. MR findings were compatible with an epidermoid cyst, this was histologically confirmed following a microsurgical L2-3 laminectomy for lesion resection. Pathologically, the lesion demonstrated a keratinized stratified squamous epithelium with keratin content without cutaneous attachments, thus confirming the diagnosis of an epidermoid cyst. Postoperatively, her sensory complains improved and her motor strength fully recovered to the 5/5 level.

Conclusion: Patients with spinal epidermoid cysts typically present with underlying spinal dysraphism, but only rarely do iatrogenic cases arise. Here, we presented a patient who developed a spinal lumbar epidermoid cyst in a female patient after undergoing spinal epidural anesthesia during pregnancy. Notably, this was successfully treated a with decompressive laminectomy and microsurgical resection.

Keywords: Cauda equina, Epidermoid cyst, Iatrogenic, Laminotomy, Lumbar puncture

INTRODUCTION

Congenital (e.g., associated with spinal dysraphism) or iatrogenic epidermoid cysts (i.e., also called "pearl tumors") represent approximately 0.5–1% of all intraspinal tumors.[1,10] Since Chiari first reported an intramedullary epidermoid cyst in 1883, over 100 other cases of spinal epidermoid cysts have been published.[1,4,5,10]

During the embryonic period, these lesions "grow" secondary to progressive invagination of epidermal elements into the neural tube.[3,4] However, they may also be attributed to the innoculation of epidermal components into the spinal canal secondary to trauma, surgery, or a lumbar puncture.[2,6]

The clinical symptoms/signs of these lesions reflect their location. Here, we present a 38-year-old female who developed an epidermoid cyst following two epidural anesthetics utilized for childbirth.

CASE PRESENTATION

A 38-year-old female with a surgical history of two cesarean sections performed with L2-L3 epidural spinal anesthesia presented with 6 months of increasing low back pain and right lower extremity L2-L4 paresthesias/tingling. For several years, she had tried various medications without improvement. She denied any history of trauma, infectious diseases, or surgeries related to her spine.

On physical examination, she had right iliopsoas, quadriceps, dorsiflexion, and plantar flexor weakness (4/5 level), diffuse hyporeflexia, and decreased pin/touch appreciation in the L3-L5 dermatomes. There was no evidence of underlying spinal dysraphism (sacral dimple, tuft of hair, or dermal sinus tract).

The magnetic resonance imaging of the lumbosacral spine with and without contrast demonstrated a well-circumscribed intradural, extramedullary lesion at the L2-L3 level m (i.e., 3.76 × 1.25 × 1.56 cm) that was slightly hyperintense on T1, hyperintense on the T2 sequence, weighted images, with peripheral enhancement on the contrast study. All findings were consistent with an epidermoid cyst resulting in displacement right to left of the conus/cauda equina [Figure 1].

Surgery

The patient underwent a L2 laminectomy for resection of the epidermoid cyst. This was performed utilizing microscopic visualization, and required a midline durotomy. The lesion was nonvascularized, grayish, pearly, and friable with a well-defined capsule that was not adherent to the surrounding nerve roots of the cauda equina (i.e., more right sided) which was fully resected [Figure 2]. The histopathology revealed fibrous capsule with a flat, stratified keratinized epithelium with keratin sheets extending toward its lumen without any skin attachments, these findings were compatible with an epidermoid cyst [Figure 3]. Postoperatively, the patient's prior neurological deficits resolved.

DISCUSSION

Congenital (i.e., with spinal dysraphism) and iatrogenic intraspinal epidermoid cysts are quite rare, especially in the lumbar spine.[6] Rather, there are multiple reports of epidermoid cysts occurring following single or multiple lumbar punctures for intrathecal therapy, diagnostic puncture, or application of intrathecal anesthetics. In 2008, Reina *et al*. analyzed the characteristics of the lumbar puncture material and concluded that it occurred due to poor lumbar puncture technique.[4,6,8] Choremis *et al*. presented six cases of epidermoid implantation cysts in children aged 7–12 years, who had undergone multiple lumbar punctures for the treatment of tubercular meningitis.[1] Pear reported a series of three cases of iatrogenic epidermoid cyst of the spinal canal after lumbar puncture or discography.[7] Gibson and Norris reported that 70% of the skin fragments on the Tuohy needles after lumbar puncture are due to insertion of these needles without prior stylet placement or improper placement.[3]

Surgery and recurrence rates

Surgical treatment, including gross total excision, is the treatment of choice for patients with persistent/significant neurological deficits.[10] In cases where the capsule is adherent to critical structures (e.g., cord/nerve roots), subtotal or partial resection may be performed to avoid neurological injury.[2]

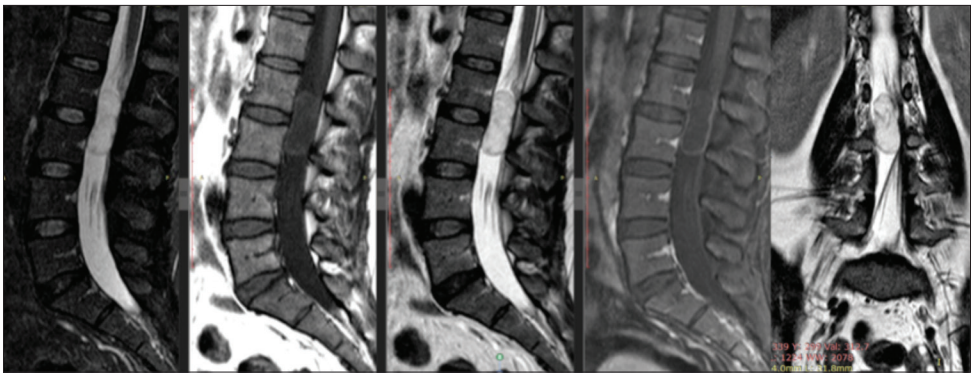

Figure 1: Noncontrasted and contrasted preoperative sagittal and coronal magnetic resonance imaging of the lumbar spine demonstrating well-circumscribed intradural, extramedullary lesion at the L2 and L3 level, measuring 3.76 × 1.25 × 1.56 cm, from the right to left that is hyperintense on T2 and STIR but isointense on T1 but with peripheral enhancement on T1 postcontrast. Note the displacement from the right to left the cauda equine nerve roots.

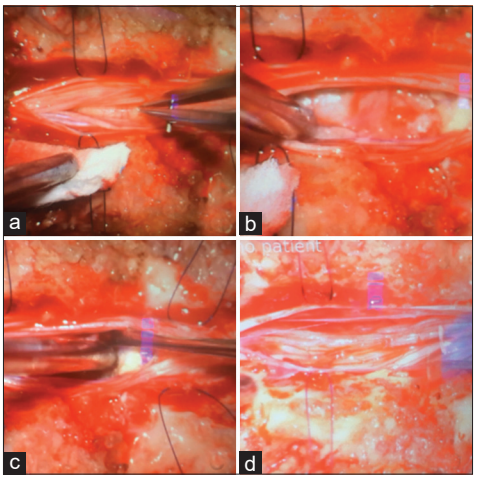

Figure 2: Microsurgical resection of epidermoid cyst (a) dural opening with displaced nerve roots and capsule of the tumor, (b) approach of the capsular portion and initiation of the debulking, (c) lesion with friable content, poorly vascularized with multiple adhesions to adjacent nerve roots, (d) total resection of the lesion without compromising nerve roots.

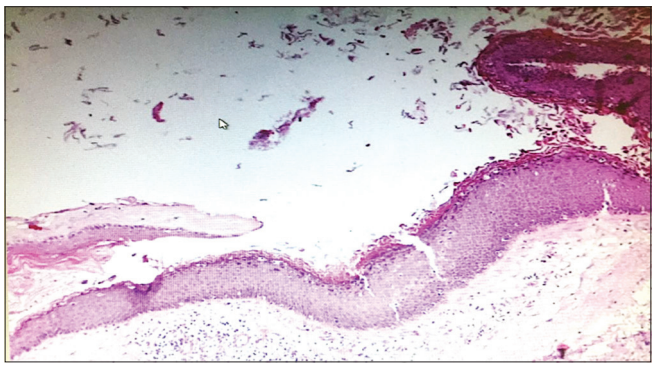

Figure 3: Microscopic image demonstrating the fibrous capsular portion, the keratinized stratified squamous epithelium as well as the keratin content without cutaneous attachments (H&E) (×40).

Although the epidermoid cysts are benign tumors, local recurrence (reported in up to 10–29% of cases) is reported, especially after subtotal excision because the incomplete excision of basal germinal cells.[5,8,9]

Although recurrent epidermoid cysts develop from 2 to 23 years after the apparent moment of implantation, in our case, the lumbar puncture occurred 9 and 13 years ago.[2]

CONCLUSION

Spinal epidermoid cyst accounts for <1% of all primary spinal cord tumors. Once identified on MR studies, gross total resection typically results in resolution of prior neurological deficits.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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