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Spinal Epidermoid Cyst of Cauda Equina Revealed by a Hypoesthesia: Case Report and Literature Review

M.A. Daraabou [a*], A.Regragui [a], O.B.A. Badirou [a], M.Hemama [a], N.El Fatemi [a] and M.R. El Maaqili [a]

[a] Department of Neurosurgery, CHU IBN SINA Rabat, Mohammed V University of Rabat, Morocco.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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Case Report

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ABSTRACT

Spinal epidermal cysts are benign malformative tumors, which can be classified into two types: congenital forms that are often associated with other malformations. (bone, cutaneous) and exceptional acquired forms. Classically, spinal epidermoids are observed in the paraslear region or in the cerebellar ponto angle. They are rare in spinal localization, or they represent less than 1% of intrarachid tumors. We present an unusual observation of a giant squamous cell cyst of the Cauda equina in a 23-year-old patient revealed by back pain and hyposthesia. A complete, total removal is the treatment of choice.

Keywords: Epidermoid cyst; intradural; laminectomy; spinal.

**Corresponding author: E-mail: docmehdiakka@gmail.com;*

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1. INTRODUCTION

“Epidermoid cysts were first described by Couvelaire in 1835. The term means "pearly tumor." These cysts are benign, slow-growing lesions that make up less than 1% of all intraspinal tumors” [1]. “Spinal epidermal cysts can be either congenital or acquired. The acquired forms are extremely rare and are mainly caused by trauma or iatrogenic procedures such as lumbar punctures or spine surgery. However, true intramedullary epidermoid cysts (IECs) that develop without spinal dysraphism or prior surgery are even more uncommon, accounting for only 0.8% of all spinal epidermoid tumors” [2].

Epidermoid cysts are infrequently found in the cervical and upper thoracic regions compared to the conus and exhibit a slight female predominance. As a slow-growing tumor with nonspecific clinical and radiological characteristics, pre-operative diagnosis is challenging. In most cases, definitive treatment involves a laminectomy followed by a gross total resection of the lesion [3-5].

2. PRESENTATION OF THE CASE

A 23-year-old man was admitted for severe lower back pain without radiation to the lower extremities. His past medical history there was no history of lumber puncture, traumatisme, congenital anomaly, or surgery to the spine. at the examination. He did not have any motor weakness on neurologic examination, just slight hyposthesia of the lower limbs. An MRI of the spine with gadolinium revealed an intracanal, intradural expansive process attached to the roots of the cauda equina and in contact with the terminal filum, occupying the dural cul-de-sac extending from L5 to S3 (Fig. 1). Within the next few hours, the patient underwent decompressive laminectomy (levels L5 to S2).

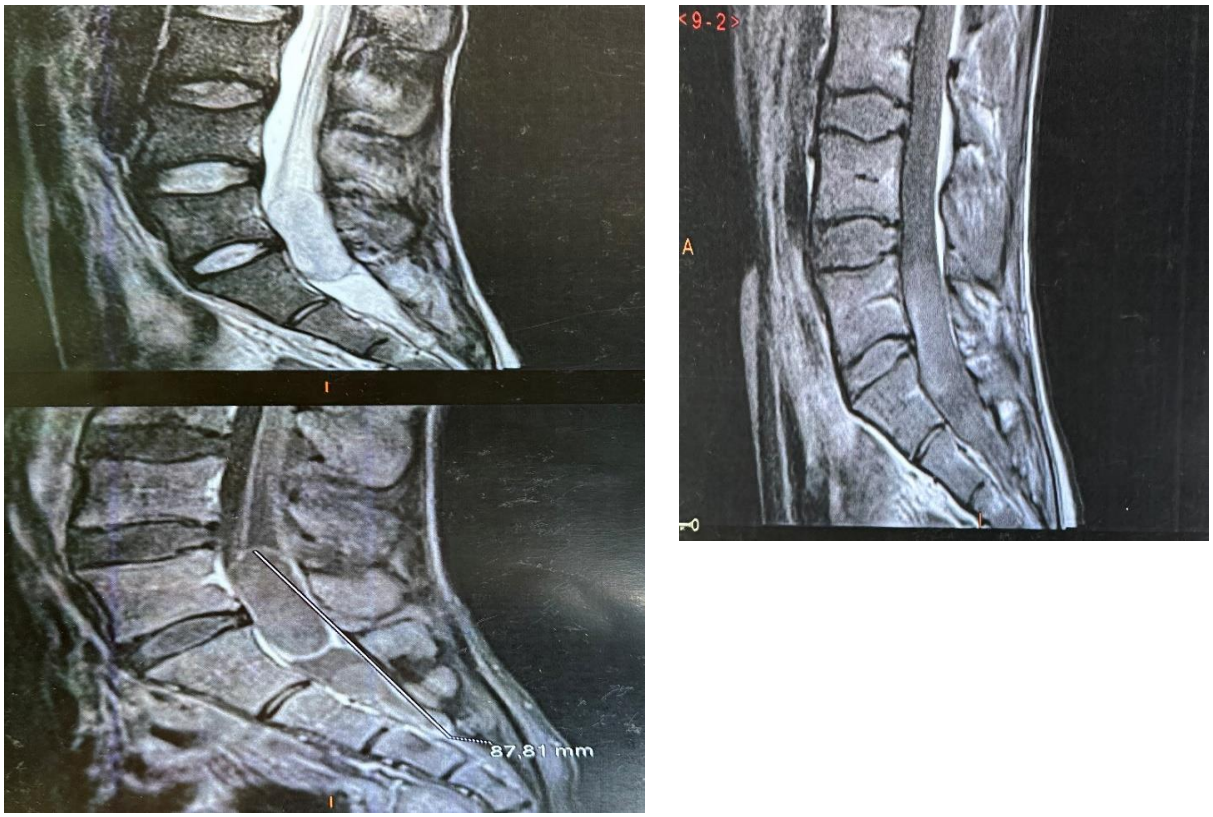

Fig. 1. Presence of an expansive intraductal, intradural process attached to the roots of the cauda equina and in contact with the filum terminale, occupying the dural cul de sac extended from L5 to S3. It has a relatively homogeneous signal in T1 hyposignal and T2 hypersignal, slightly enhanced and heterogeneously after PC injection, with individualization of a fleshy portion surmounted by a cystic portion taking up the contrast at the periphery. It measures 17 x 20 x 87 mm long

3. DISCUSSION

"The pathogenesis of spinal epidermoid cysts can be categorized into two types: congenital and acquired. These cysts are also classified based on segmental distribution, associated congenital lesions, and clinical presentation" [1].

"The pathomechanism of congenital epidermoid cysts is believed to involve the inclusion of ectodermal cells during the closure of the neural tube, between the 3rd and 4th weeks of embryonic development. The congenital origin of the tumor is supported by its association with other epidermal and osseous abnormalities such as spina bifida, hemivertebrae, myelomeningocele, diastematomyelia, syringomyelia, and cutaneous and dermal defects like pilonidal and dermal sinuses, as well as its discovery before the age of 20" [2].

Acquired epidermoid lesions typically manifest years after one or more lumbar punctures and are believed to result from iatrogenic penetration of the skin. Our patient showed no signs of congenital spinal cord disorders, such as scoliosis, tufts of hair, skin dimpling, pigmentation abnormalities, or prior spinal procedures like lumbar punctures, spine surgery, or trauma [6-8].

"Epidermoid cysts are slow-growing lesions that cause symptoms as they expand and compress nearby neurological structures. Initial symptoms are often nonspecific and may include dull, localized back pain, numbness or weakness in the lower extremities, and sometimes incontinence. The specific symptoms depend on the location and the nerve roots affected by compression" [9].

On MRI, epidermoid cysts typically appear iso-intense compared to surrounding cerebrospinal fluid. "The lesion usually exhibits well-defined borders and peripheral enhancement following gadolinium administration, as observed in this case. Diffusion-weighted imaging can aid in distinguishing epidermoid cysts from arachnoid cysts, with epidermoid cysts typically showing diffusion restriction, unlike arachnoid cysts" [9]. However, a definitive diagnosis is confirmed histologically, revealing a cyst wall composed of keratinizing stratified squamous epithelium. This was evident in our patient, whose MRI showed T1 hyperintensity and T2 hypointensity.

Asymptomatic epidermoid cysts may be managed conservatively, but symptomatic cases typically require laminectomy followed by surgical resection, which is considered the treatment of choice. Achieving a gross total resection is often feasible and safe; however, due to adherence of the cyst to surrounding neural tissue, some cases may necessitate a less aggressive subtotal resection. Electromyography and somatosensory evoked potentials are employed to ensure postoperative neurological function integrity. Somatosensory evoked potentials assess lower extremity function from L4 to S1, while electromyography monitors external anal sphincter activity to confirm the integrity of S2-4 nerve roots. Effective gross total resection is facilitated by meticulous microsurgical technique and the use of an ultrasonic surgical aspirator for debulking. Despite being uncommon, recurrence can occur following subtotal resection, emphasizing the importance of complete tumor removal where feasible, despite the challenge posed by tumor adherence to adjacent tissues [10,11].

"There is at least one documented case of a recurrent epidermoid cyst that required repeat surgery and the placement of an Ommaya reservoir for continual drainage" [12]. "Tumor regrowth typically takes years, and atypical hyperplasia is exceedingly rare; however, it has been documented" [12,13]. "Fortunately, in our patient, a total tumor resection was obtained, and biopsy specimens were sent for pathological analysis. Pathology confirmed the diagnosis as an epidermoid tumor without a malignity sign. After surgery follow-up, the patient reported significant improvement in pain and sensory deficits" [14].

4. CONCLUSION

Intramedullary conus epidermoid cysts are uncommon but familiar to neurosurgeons. They can originate as congenital lesions or develop as complications following lumbar puncture. Clinical symptoms typically manifest late, progressing as the cyst enlarges and compresses surrounding structures. MRI is the preferred diagnostic tool for both pre-operative assessment and post-operative monitoring. Surgical intervention is the standard treatment for epidermoid cysts, requiring complete removal of both the cyst contents and its capsule.

This case report highlights several aspects of spinal epidermoid tumors. The patient did not have a dysraphic spine or a history of lumbar punctures. We successfully achieved complete tumor removal in this case.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

CONSENT

As per international standards or university standards, patient(s) written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standards or university standards written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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