

REVIEW ARTICLE

A Rare Case of Intramedullary Spinal Dermoid Cyst in Young Adult with No History of Trauma: A Case Report

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ABSTRACT

Introduction: Rare and benign, intramedullary spine dermoid swellings are primarily caused by the neural tube's improper closure during development. They appear in the second and third periods of life and are slow-growing tumours. Only 1% of people have intramedullary dermoid cysts.

Case report: We reported an 18-year-old female with backache which is mild to moderate intensity, gradually progressive and now increased to cause inability to lie down supine for 7 days. Patient also developed both lower limb weakness for 15 days which is gradually, progressive and now patient is bed bound for 5-6 days. Patient developed urinary retention 7 days back when she was catheterized at PVT Hospital.

History of constipation present.

No history of trauma / fever/ cough/loose motion.

MRI Spine suggestive of contrast enhancing well defined intramedullary lesion at D12 level with cord expansion

Patient underwent D12 laminectomy and symptoms improved postoperatively.

Conclusion: It is uncommon for adults without a history of trauma to develop dermoid cysts. The therapeutic option is surgical excision. However, to keep an eye on the sensory-motor function, long-term monitoring is required.

Key Message:

- Intramedullary spinal dermoid cyst is a distinctive and unusual.
- A fast and correct diagnosis is required to obtain favorable results.
- The motor and sensory functions before and after surgery are bettered.

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KEYWORDS

• Dermoid cyst • Backache • Urinary retention • D12 laminectomy • Surgical excision • Neural tube

INTRODUCTION

Dermoid cysts form in the spine, particularly in the intramedullary region. Intramedullary, dermoid cysts only occur in 1% of cases. The lumbosacral spine is preferred 60% of the time, followed by the thoracic spine (10%) and the cervical spine (5%).

Histologically, dermoid cysts differ from epidermoid cysts. While epidermoid cysts are covered with multilayer squamous epithelium and solely contain pronounced keratin, dermoid cysts are treated with dermis, which has sebaceous glands and other skin appendages like hair. It is also necessary to distinguish adult cystic teratomas from both lesions because they contain derivatives from several layers of embryological cells. When the embryological process that shuts down the neural tube fails, they grow from the remnants of cells. The rostral and caudal regions are reached once the process begins in the neural tube, which is where the lower cervical cord begins.

A female 18-year-old with a neurological deficiency was described in this article. Using MRI, we discovered an intramedullary tumor at level D12-L1. After excision, we conducted a histology examination, which revealed a dermoid cyst. The subject has given their written consent. No conflicts of interest are disclosed by the writers.

CASE PRESENTATION

A 18-year-old female was accessible with lower back ache in the last 1 month before admission. Since a month ago, the patient has been dealing with back pain. The discomfort was sporadic and mild. The pain did not radiate. The patient also specified that she developed it suddenly about one month back and gradually progressive.

On arrival in ER, patient now complains increase in intensity of pain and not able to lie down and not able to control urine and has constipation since last 1 week. She was not able to stand and sensory and motor loss in B/L lower limb for 1 week.

No history of illness, spinal damage, prior spinal surgery, or trouble urinating or defecating was present. She denied having a family history of tumors and did not recall using any previous medications. A student was the patient.

On arrival in ER:

Hr: 106bpm

Bp: 110/60mmhg

Rr: 20/min

Spo2: 99% at RA

Primary survey

Airway: patent

Breathing: no added sound and cyanosis, no laboured breathing

Circulation: CRT - normal, PP - present no delay

Disability: GCS-15/15, RBS- 114mg/dl

Exposure: no rashes, scars, discoloration.

SECONDARY SURVEY

HEENT: no pallor, icterus, clubbing, cyanosis, lymphadenopathy and oedema.

Head: normal

Neck: no distended neck vein

Eye: normal

Ear: normal

Throat: normal

Respiratory system: NVBS+

CVS - S1S2+

Per abdomen: soft nontender

CNS

On examination:

Speech and memory intact

Cranial nerve intact

Tenderness in d12-l1 level

Power bilateral upper limb - 5/5, bilateral lower limb - 0/5

Tone reduced in bilateral lower limb
Pain and touch sensation absent below L2 level
Bilateral plantars-mute
The patient's clinical presentation was displayed in Before surgery

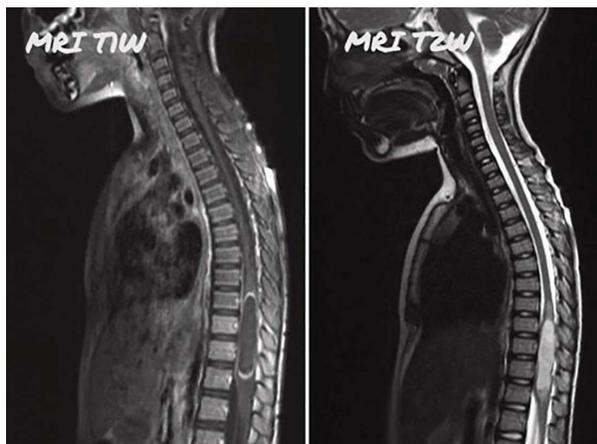


Clinical assessment revealed that the overall condition was normal. The spine's local condition was normal. Both the left and right lower limbs have a power of 0/5. Sensory examination revealed no sensations below L2 level.

B/L plantars - mute

Magnetic resonance imaging (MRI)

CEMRI imaging of the whole spine we found T8 showed well defined altered signal intensity mass lesion with internal solid and cystic component measuring 14*13*25mm appearing heterogeneously hyperintense, mass lesion is slightly eccentric towards right side causing minimal focal contour buldge of anterior and post lateral surface of thecal sac likely intramedullary tumour? astrocytoma? hemangioblastoma.



An excisional tumour was removed from our patient. A neurosurgeon and spine consultant carried out the treatment. The spinal cord was nearly completely removed, and the cyst was removed. The tumor's histological analysis revealed a dermoid cyst.

Histopathological examination revealed

- thickened arachnoid
- tumor capsule
- intramedullary tumor

After surgery



The patient reports that she no longer experiences back discomfort and that her motor and sensory functions are not being disrupted. The surgical results were reevaluated six months later, and the patient had not experienced any new disruptions.

Post-op period:

- On discharge patient had
- B/L lower limb power of 2/5
- No signs of urinary retention and constipation

DISCUSSION

Dermoid cysts are found in the spine, particularly at the intramedullary location, and were initially identified by Verratus in 1745. Less than 1% of spinal tumors are intraspinal dermoid cysts, also known as "spinal cutaneous inclusion tumors," which are uncommon,

benign, and slowly developing tumors. They are known to favor the cervical spine 5%, thoracic spine 10%, and lumbosacral spine 60%. According to this case study, a female patient, age 18, has been experiencing lower back pain, constipation, and urine retention for a month. An intramedullary tumor as high as D12-L1 is discovered following an MRI test.

Dermoid cysts may be acquired or congenital. These cysts are more prevalent in youngsters (10-17%) and make up 1%-2% of intraspinal tumors. Ectodermal cells are thought to implant after nerve tube shutting in the third to fifth week of fetal development, causing congenital lesions. Lesions may be acquired as a result of surgery or trauma. Dermoid cysts are frequently found on the scalp, noggin, intracranial, and intraspinal regions, particularly intramural extra medullary; they are also infrequently found intramedullary and linked to other spinal abnormalities. However, the tumor in this case was said to have developed during the adult stage of life, and there was no prior trauma history. This suggests the presence of an unusual dermoid cyst.

When symptoms first appear in childhood, they frequently cause delays in diagnosis since they are typically sluggish and ambiguous. Infants and young children frequently suffer from weakness, motor regression, and excruciating discomfort. The location and size of the tumor determine the symptoms, which are caused by lesions that take up space and pressure nearby structures. Urological dysfunction, pain, sensory disturbances, and motor disorders are common. With a history of trauma, dermoid cysts typically develop in childhood or age. In this instance, the patient has scoliosis, an abnormal spinal growth defect, but a dermoid cyst develops later in life after he has had severe symptoms.

When these cysts develop clinically as neurological symptoms, such as paraesthesia, paralysis, or sphincter problems, they are frequently detected. In this instance, the patient develops paresis, numbness, and weakness that eventually lead to complete immobility. The individuals in our case had urinary symptoms, such as retention or incontinence, but Bradford's situation sequence of epidermoid and dermoid spinal cord tumors shows that most cases present with similar symptoms. This case shows a great scientific depiction of

an intramedullary backbone dermoid swelling without any indications of spinal dysraphism or the typical incontinence symptoms.

In our instance, we also used MRI and histological analysis to confirm the judgement of dermoid swellings in patients undergoing spine surgery. MRI signal intensity characteristics change according to the cystic content. On T-1 weighted images, the two primary components of fat and fluid are hyperintense, which is most consistent with comparable findings. The region of T1 hyperintensity on the T2-weighted image displays a heterogeneous dense portion of the hyperintense tumor and a comparatively lower signal intensity. Myxopapillary ependymoma, spinal lipoma, and epidermoid cysts are among the differential diagnoses for spinal dermoid cysts. MRI differentiates between a dermoid and a lipoma by looking at the non-fat portion of the former. In contrast to ependymomas and epidermoid, fat hyperintensity is more unique to dermoid. The discrepancy of the dermoid from the epidermoid is also made possible by intrinsic shortening of T1. In this instance, Using magnetic resonance imaging (MRI) of the whole spine, we found a TA heterogeneous intramedullary mass scrape (intramedullary solid-cystic density mass). As high as D12-L1, syringomyelia with an oval shape $\pm 4.3 \times 2.4$ cm can be found in the skull up to T8, 9, and 10. The T2-weighted imaging showed heterogeneous hyperintense, while the T1-weighted picture showed heterogeneous hypointense. We used MRI to make a differential diagnosis between a suspected spinal astrocytoma and an intramedullary tumor.

Histopathological analysis provides the most accurate diagnostic for determining the type of tumor. Aggregates of keratinocytes and degenerated keratin flakes were found in the histological analysis. A multilayered, cornified monolayer with the dermis and hypodermis having a collagen stroma, as well as cutaneous appendages including hair follicles, hair, sebum and sweat glands, and sebum, typically envelop these tumors. The findings of acquiring preparations including data on the Intradural tumor origin showed fragments of connective muscle in stratified squamous epithelium keratin layers with hair cavities that contained calcification particles, cholesterol crystals, and hair shafts. A histopathological investigation and cyst excision were performed on the patient. A dermoid cyst can be inferred.

Early removal of the entire mass is the preferred treatment for dermoid cysts. For extramedullary dermoid cysts, the entire mass can be removed; however, for intramedullary dermoid cysts, the lozenge is connected to the spinal cord and frequently makes full surgical resection challenging. The tumor in our instance had a well defined border, allowing for complete excision.

In a study of 54 patients with surgically treated intramedullary spinal cord tumors, Kane *et al.* discovered that if total tumor excision was carried out, adjuvant postoperative radiotherapy was frequently not required. This suggests that the effectiveness of radiotherapy is still unknown and has not been proven. Radiotherapy is not necessary, particularly for patients with low-grade tumors. No postoperative radiation was administered to this patient.

During the initial post-operative period, we noticed meningitis and CSF leaks. Literature recurrences are uncommon. Long-term monitoring is necessary. We could not find any indications of meningitis or CSF leakage in this patient. Prior to and following surgery, the motor and sensory abilities remain unchanged. We use electromyography (EMG) to monitor motor function throughout intraoperative procedures; we do not see any changes in motor function until the procedure is complete.

CONCLUSION

In people who have never experienced trauma, dermoid cysts are unique and uncommon occurrences. A prompt and precise diagnosis can lead to positive results and is necessary for appropriate therapy. We have already removed the entire dermoid cyst with excisional surgery. After the procedure, the motor result improved. Following surgery, rehabilitation is necessary to achieve the best outcomes.

Further follow up after discharge is required to assess the patient and track the recurrence. This case report highlights the recognition and complication associated with intramedullary spinal dermoid cyst.

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