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Intramedullary mature cystic teratoma of the conus medullaris

A case report

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Intramedullary teratoma is extremely rare and to our knowledge has been reported in only nine cases in the literature. We report a case of mature cystic teratoma of the conus medullaris. The case was diagnosed by magnetic resonance imaging and operated with microneurosurgical techniques.

Key words: **Mature cystic teratoma - Intramedullary teratoma - Conus medullaris.**

Teratomas are uncommon tumours of the nervous system, and are most commonly located in the pineal region.[1, 2] Spinal teratoma is rare, usually developing in the sacrococcygeal region and often seen in neonates.[1-3] There is some confusion regarding the terminology, with designations such as teratoid, teratoid cyst, teratomatous cyst, teratoma and cystic teratoma previously used to indicate the same category of tumour and several hypotheses concerning the pathogenesis have been reported and several theories offered in attempts at explanation.[4] Poeze *et al.* described 83 cases of spinal tumours and 31 intramedullary spinal teratoma cases in their case report and review of literature studies.[3] Some authors have described that the current and most adequate classification in spinal teratoma is that it is composed of derivatives from all three primitive germ layers that distinguishes between mature and immature forms based on the degree of differentiation. Furthermore, they stated that the presence of only two germinal components does not necessarily rule out this diagnosis. They also commented that the intramedullary variety of teratoma is extremely rare, having been reported only seven times during the last 30 years.[5]

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Case report

A 42-year-old female presented with a one-year history of back pain and a one-month history of urinary incontinence. Her neurological examination revealed bilateral Lasegue sign (+) at 60º and bilateral numbness in her legs. MRI of the spine revealed an intradural solid-cystic lesion at the L1 level on the conus medullaris (Figure 1 A, B). L1 total laminectomy was performed. Intramedullary cystic-solid lesion was removed totally with microneurosurgical techniques under surgical microscope. A midline myelotomy was performed at the conus medullaris level. The cystic component was entered revealing white material when the lesion was opened. The solid lesion was removed with intralesional approach, thereby protecting the roots and other neurological anatomic structures (Figure 2).

Microscopic examination demonstrated a tumor characterized by ectodermal (squamous epithelium), endodermal (mucous and serous glands) and mesodermal (adipose tissue) tissues. Diagnosis of mature cystic teratoma was made based on its composition of mature tissues representing three embryonic layers (Figure 3).

The postoperative course was uneventful. There were no lesions on postoperative MRI (Figure 1 C and D), and no complications were observed during her routine follow-up examinations.

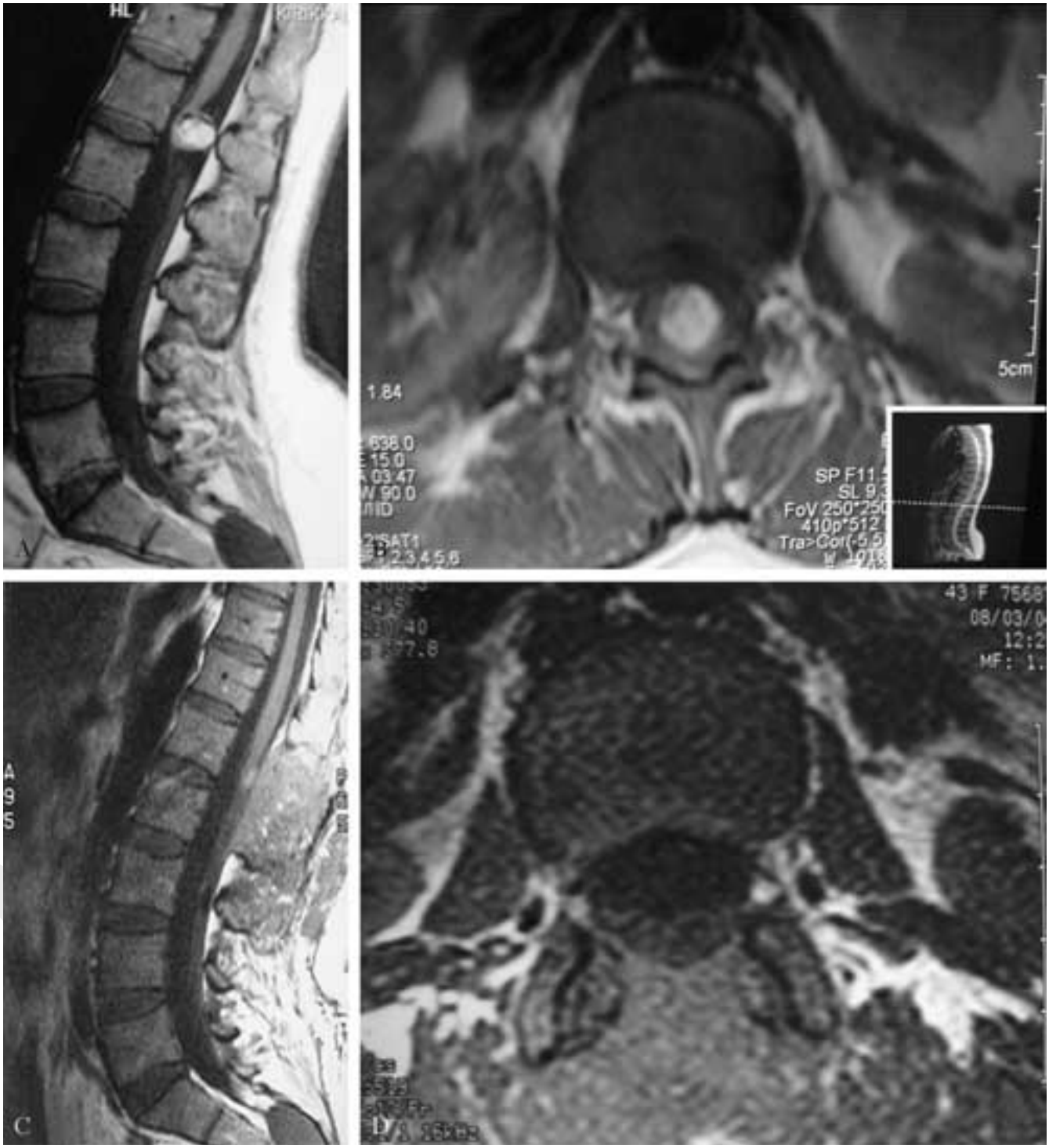

Figure 1.—A) Preoperative midline sagittal MRI (T1-weighted) showing the lesion at the conus medullaris level. B) Preoperative axial MRI (T1-weighted) showing an intramedullary lesion. C) Postoperative midline sagittal MRI (T1-weighted) showing total resection of the lesion at the conus medullaris level. D) Postoperative axial MRI (T1-weighted) showing the total resection of the lesion.

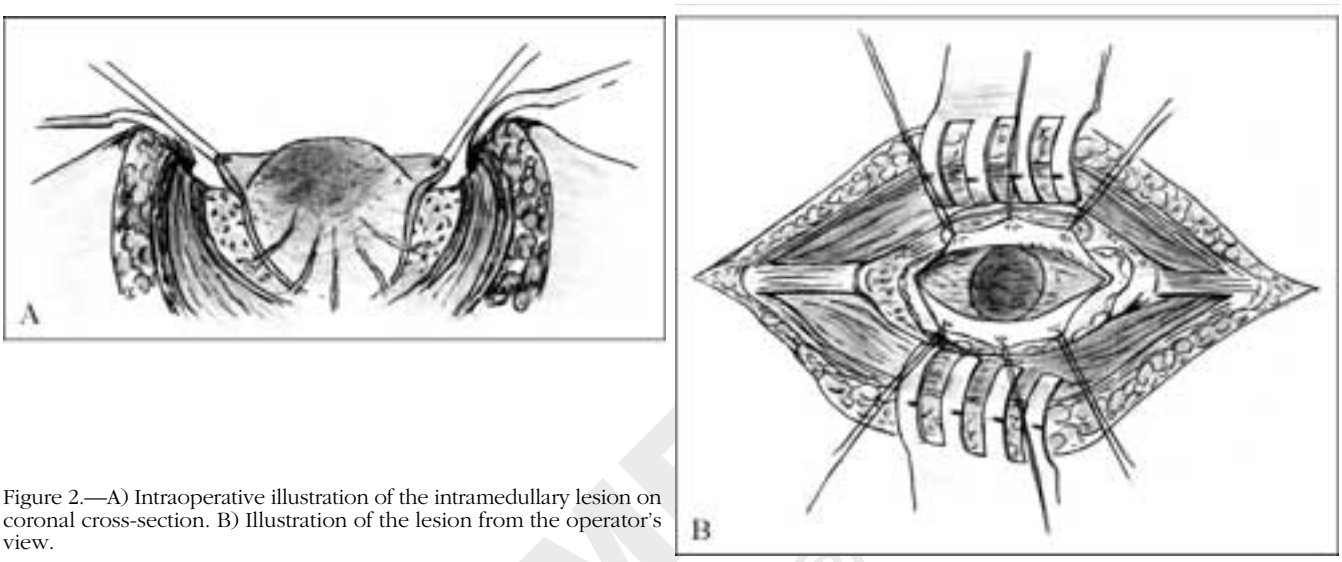

Figure 2.—A) Intraoperative illustration of the intramedullary lesion on coronal cross-section. B) Illustration of the lesion from the operator's view.

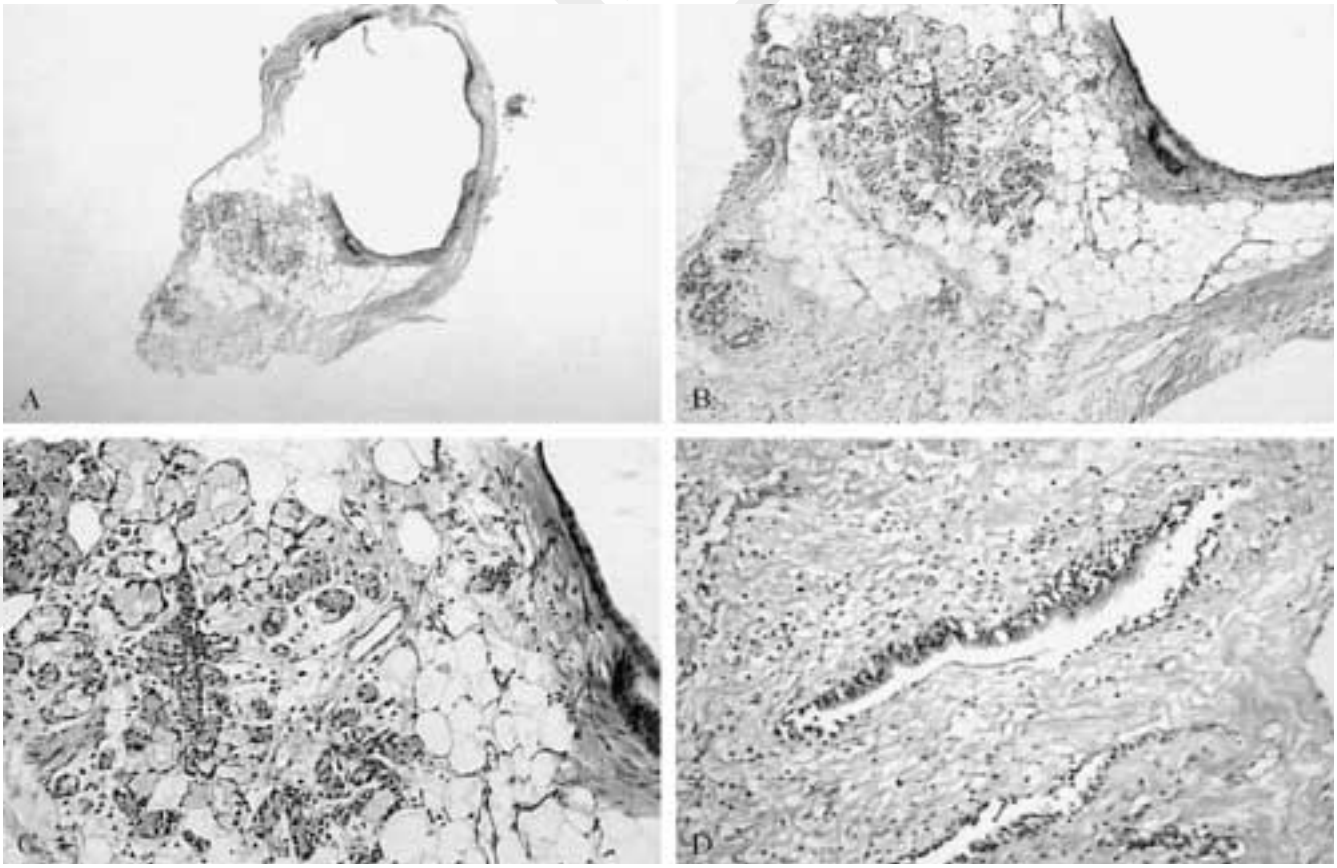

Figure 3.—A) A small cyst with an epithelial lining in a fibroadipous stroma (H&E×40). B) In the same specimen the lining of the cyst is stratified squamous epithelium. A small group of serous and mucinous type glands are evident near the cyst wall (H&E×100). C) In the same specimen the closer view of the glands (H&E×200). D) Another cyst with a lining of pseudostratified ciliated respiratory epithelium (H&E×200).

Discussion

The most frequent site of intramedullary teratoma is the thoracolumbar region, as in our case. To our knowledge intramedullary teratoma has been reported only nine cases in the literature.[5-12] Only one case was found in the cervical region.[11] In all cases in the literature, cystic and solid components were found, as in our case, and these patients frequently presented with back pain and bladder dysfunction.

Some authors have advised computerized tomography (CT) scans for the preoperative diagnosis of teratoma of the spinal cord, and have described that CT scans revealed tumours of different densities within the spinal canal; this heterogeneity may help to differentiate teratoma from other spinal cord tumours.[13] With technological advances, MRI has become the best technique for preoperative diagnosis for spinal teratomas as with the other spinal tumours. MRI has contributed to the early detection of the teratoma and to definitive diagnosis of patients.[5] This technique has also demonstrated the different intensities of the components of the mass and the presence of fatty tissue and could define the precise localization of the tumour, its morphology, and its relation to the conus medullaris.[10]

Total surgical resection of the tumour should be the aim of the operation. Some authors have described that surgery is complicated by the intimate adhesion of the tumour to the spinal cord and to the roots of the cauda equina; incomplete removal of the tumor can lead to re-growth of remaining endodermal or ectodermal elements.[10] Poeze *et al.* explained that treatment of intramedullary teratomas is surgical, especially since an exact diagnosis as benign or malignant cannot be made preoperatively. They stated that intramedullary tumours could be completely removed in 61.8% of the reported cases and that improvement in symptoms occurred in 45.5% of these.[3]

To our knowledge, our patient is the 10th case of intramedullary mature cystic teratoma in the literature. It is our opinion that the radical tumour resection under microneurosurgical techniques with intralesional approach should be the goal of surgery, thereby protecting the neurological anatomical structures, especially roots, and preventing tumour re-growth.

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