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Intramedullary epidermoid cysts are rare tumors. They are slow-growing benign tumors, and represent less than 1% of all intraspinal tumors [1]. The vast majority are subdural and extramedullary. Thoracic region is the favorite site of intramedullary epidermoid cysts and the lumbar region is the next common area [2]. We present a case of intramedullary epidermoid cyst in the low-thoracic region and its MRI findings.

CASE REPORT

A 74-year-old female developed progressive difficulty in walking associated with stiffness and paresthesia for three months. There was no history of trauma or any procedure on the spine. Clinical examination revealed spastic paraparesis with muscle power of grade 1 (Medical Research Council grading scale) on both lower limbs. Sensory examination revealed loss of all sensation below T12 segment. Sacral dermatomaial sensations were preserved. Deep tendon reflexes decreased in both lower limbs. MRI study of the thoracic-lumbar spine was performed. An intramedullary cystic mass measuring 1.5 × 1.2 cm at the T11 level was found. The lesion was hypointense on T1-weighted sequence (Fig. 1) and hyperintense on T2-weighted sequence (Fig. 2) with minimal peripheral enhancement following intravenous Gd-DTPA administration (Fig. 3). The patient underwent T10 to T12 laminectomy with removal of the tumor. The pathology showed a fibrous wall lined with stratified squamous epithelium surrounding a cyst, consistent with an intramedullary epidermoid cyst (Fig. 4).

DISCUSSION

Intramedullary epidermoid cysts are rare in the spinal cord. They are slow-growing benign tumors, and represent less than 1% of all intraspinal tumors [1]. Histologically, epidermoid cysts have a fibrous wall...
lined with stratified squamous epithelium surrounding a cyst containing waxy squames [3]. Epidermoid cysts most commonly present in third to fourth decades, and predominantly in males [1]. It can be either congenital or acquired. Manno et al [4] reported a series of 90 intraspinal epidermoid cysts collected from the literature, of which 39 were acquired and 51 were congenital. Acquired epidermoid cysts have been found years

Figure 1. a. Sagittal and b. axial T1-weighted spin echo (TR/TE=500/15 msec, 732/15) MRI demonstrates an intramedullary cystic mass with hypointense signal intensity at the T11 level (arrow).

Figure 2. Sagittal T2-weighted fast spin-echo (2300/103) MRI shows the lesion with hyperintense signal intensity (arrow).

Figure 3. Sagittal T1-weighted spin-echo (572/15) delineates minimal peripheral enhancement after gadolinium administration (arrow).
after single or multiple lumbar spinal punctures and are thought to result from iatrogenic penetration of skin fragments [4-6]. It is generally believed that congenital epidermoid cysts originate from displaced ectoderm inclusions arising in early fetal life and may be associated with defective closure of the dural tube [4, 7, 8].

In our case, the patient denied any history of trauma or puncture. Also, it is unreasonable to puncture at so high level during medical procedure. The old age of symptom onset is less possible for a congenital lesion, except a very slow-growing lesion. Finally, we supposed it is caused by either a congenital lesion with an extraordinary slow-growing pattern or a subtle trauma event with unaware puncture to the cord.

In the report of Chandra et al [9], intramedullary epidermoid cysts showed hypointensity on T1-weighted sequence and hyperintensity on T2-weighted sequence. The margins of the lesions had an irregular or a shaggy appearance possibly because of chronic inflammatory response to the squamous tissue leak through the capsule and variable gliosis along the margin [9]. Penisson et al [1] reported a heterogeneous intramedullary epidermoid cyst with a high-intensity portion on T2-weighted images. Intravenous injection of Gd-DTPA demonstrated peripheral enhancement on T1-weighted images. Kachhara et al [10] reported an acquired cauda equina epidermoid cyst, which was isointense on T1-weighted images and hyperintense on T2-weighted images. Post-contrast images revealed faint peripheral enhancement. Overall, on MRI, epidermoid cysts had heterogeneous hypointense signal on T1-weighted images and hyperintense signal intensity on T2 weighted images with no contrast enhancement or minimal peripheral enhancement following intravenous gadolinium administration.

The differential diagnosis depends on the signal intensity of cyst content and the enhancement pattern of cyst wall. However, because of the similar imaging features, it is not easy to make differential diagnosis between epidermoid cyst, dermoid cyst, ventriculus terminalis and arachnoid cyst on MRI. Dermoid cysts contain mature tissues of ectoderm with predominance of fatty components, characterized by heterogeneous hyperintensity on all sequences [11, 12]. The high signal intensity on T1-weighted images makes the diagnosis easier as a result of the fatty content of the tumor [11]. The ventriculus terminalis, also known as the fifth ventricle [13], is a small ependyma-lined cavity in the conus medullaris, and it is usually in continuity with the central canal of the rostral spinal cord [14]. The ventriculus terminalis is ovoid, smooth walled and has no internal septum. The intracystic fluid follows the signals of cerebrospinal fluid (CSF), characterized by low signal on T1-weighted and high signal on T2-weighted sequences. In the 8 (72.7%) of 11 cases given Gd-DTPA by the report of Coleman et al [15], there was no abnormal enhancement on the wall or at the adjacent conus medullaris. Sigal et al [16] described the ventriculus terminalis localized to the conus, nonehancing and smooth walled, and following all CSF signal characteristics on MRI. Archnoid cysts are intra-arachnoid and lined by archnoid membrane. The cysts arise in both intracranial and intraspinal locations. On MRI, the common appearance of arachnoid cysts is an extraaxial mass that has signal intensity identical to CSF on most pulse sequences [17]. Hakyemez et al [18] reported the apparent diffusion coefficient (ADC) values of epidermoid cysts were lower than those of arachnoid cysts, but were higher than those of cerebral white matter. It was also shown the diffusion-weighted trace imaging and measurement of ADC values might be used as problem solving tools [18].

In conclusion, epidermoid cysts should be included in the differential diagnosis when encountering an intramedullary cystic mass with the aforementioned MRI features.

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胸椎末端脊髓内表皮样囊腫在磁振造影之表现：
病例报告

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脊髓内表皮样囊腫並不常見，約略只佔所有成年人脊髓內腫瘤的1%不到。我們報告一個
74歲女性病例，症狀為近三個月來有漸進式行走困難及感覺異常，磁振造影看到胸椎末端脊髓
内(第十一胸椎)有一水囊狀腫瘤，呈現出T1WI低訊號，T2WI高訊號，在注射完顯影劑後出現
病兆週邊訊號變化，後來病人接受手術切除腫瘤，病理證明為脊髓内表皮样囊腫。當一病人發
現有脊髓内水囊狀腫瘤，有上述影像學的表徵時，應將脊髓内表皮样囊腫列入鉴别診斷。

關鍵詞：表皮樣囊腫 脊髓 腹腫 脊髓 磁振造影