Acquired Lumbar Epidermoid Cyst in an Adult
—Case Report—

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Abstract

A 61-year-old female complained of low back pain, and had been treated by spinal anesthetic injection more than 70 times over 14 years. Magnetic resonance (MR) imaging, performed at the age of 47 years, revealed no abnormal lesion. However, she developed irritable hypesthetic pain in the left leg at 61 years of age. MR imaging revealed a round mass appearing isointense on the T1-weighted and slightly hyperintense on the T2-weighted images. Laminectomy revealed an epidermoid cyst, which was removed. This case clearly demonstrates that adults can acquire epidermoid tumor which very probably has an iatrogenic origin. The incidence of epidermoid tumor is low, but we should be aware of the potential adverse complications such as formation of epidermoid tumors after lumbar puncture.

Key words: epidermoid cyst, iatrogenic origin, lumbar spine

Introduction

Epidermoid cyst, also called “pearly tumor” because of the smooth, glistening, white capsule, accounts for less than 1.0% of all intracranial tumors and is even rarer in the spinal canal. Most intraspinal epidermoid tumors occur in intradural extramedullary locations at the lumbar level, in contrast to other tumors such as gliomas and neurinomas. Epidermoid cysts are generally considered to be congenital, and are usually associated with spinal congenital anomalies. Development is related to anomalous implantation of ectodermal cells at the time of closure of the neural tube, between the 3rd and 4th weeks of embryonic life. The growth rate is extremely low.

Iatrogenic origin for epidermoid tumor is possible if a previous surgical procedure could cause coring of the skin tissue in the lesion. Most cases of cauda equina epidermoid were in pediatric patients who underwent open surgery for spina bifida which confirmed absence of pre-existing epidermoid tumor. Iatrogenic epidermoid tumor has also been associated with lumbar puncture as the cause of skin tissue coring. However, these cases only included circumstantial evidence such as a history of multiple lumbar punctures at the same location as the tumor.

We report a case of de novo lumbar epidermoid tumor in which magnetic resonance (MR) imaging had detected no initial pathological lesion and then revealed epidermoid formation after a long history of repeated lumbar injection procedures.

Case Report

A 61-year-old female suffered from low back pain and left leg numbness for 15 years. Initial MR imaging to investigate low back pain revealed no pathological lesion at age 47 years (Fig. 1). She was treated by local injection of anesthetic agent more than 70 times over the following 14 years. She experienced irritable hypesthetic pain in the left leg for 3 months before admission. T1- and T2-weighted MR imaging of the lumbar spine demonstrated a lumbar spinal tumor. She was admitted to our hospital to undergo surgical treatment.

Physical examination found no abnormality on the lumbar skin, and neurological examination also detected no abnormalities. Sphincter function was normal and the straight leg raising test was negative. Radiography of the spine showed no abnormalities. MR imaging demonstrated a well-circumscribed intradural mass at the L-4 level (Fig. 2). T1-weighted MR imaging showed the mass as isointense, and
T1-weighted imaging as slightly hyperintense. T2-weighted MR imaging with gadolinium-diethylenetriaminepenta-acetic acid showed no enhancement.

Laminectomy exposed a pearly encapsulated tumor displacing the cauda equina (Fig. 3). The tumor capsule had adhered to a nerve of the cauda equina on the ventral side. The tumor was completely removed without requiring sacrifice of the nerve root. Histological examination demonstrated keratinaceous debris circumscribed by epithelial tissue. The histological diagnosis was epidermoid tumor without malignancy.

**Discussion**

Direct implantation of epidermal elements into the spinal canal by lumbar puncture using needles without stylets or with ill-fitting stylets has been suggested as a cause of epidermoid tumor for a long time.\(^2\)\(^-\)\(^5\),\(^8\),\(^10\),\(^14\) Intraspinal epidermoid tumors were reported to result from spinal puncture in children who received multiple subarachnoid injections of streptomycin for treatment of tuberculous meningitis in 1956.\(^2\) Experiments in 1958 demonstrated that a small fragment of epidermis can remain in the needle during skin puncture with an overall frequency of 69%, with no great variation with different sizes of needles, and needles with well-fitting stylets do not remove skin fragments.\(^4\) Growth of epidermoids and dermoids was confirmed following direct skin implantation along the neuraxis of newborn rats in 1967.\(^14\) Therefore, implantation of epithelial cells may be an important noncongenital cause of epidermoid tumor. A review found that the etiology of at least 41% of all intraspinal epider-
moids could be traced to lumbar punctures performed in the past.\(^9\)

In our case, T\(_1\)-weighted MR imaging showed the mass as isointense, and T\(_2\)-weighted imaging as slightly hyperintense. Although epidermoids are typically hypointense on T\(_1\)-weighted imaging and hyperintense on T\(_2\)-weighted imaging, the appearance varies from hypo- to isointense on both T\(_1\)- and T\(_2\)-weighted imaging.\(^1,7,12\) This variability in signal characteristics, which might be related to the chemical state of cholesterol or the relative composition of cholesterol and keratin,\(^1,7\) makes the preoperative diagnosis difficult.

Myelography in some previously reported cases of iatrogenic spinal epidermoid tumor showed no pre-existing mass at the site.\(^2\) The reason for performing myelography was probably low back pain. Small epidermoid tumor could cause low back pain but be missed by myelography due to the limited dimension of imaging. In the present case, MR imaging performed 14 years before the present admission clearly excluded the presence of pre-existing tumor in both sagittal and axial views. Our case clearly demonstrates that an adult can acquire epidermoid tumor. Our patient had been treated by spinal anesthetic injections more than 70 times over 14 years. Dura penetration of the needle at each procedure was uncertain and the type of needle was not documented, but she also had a history of lumbar anesthesia for a hysteromyomectomy at age 49 years. Therefore, we strongly suspect that the origin of this epidermoid tumor was iatrogenic. The time duration between the lumbar puncture and the onset of the symptoms related to the epidermoid tumor ranges from 2 to 23 years.\(^9\)

In the present case, serial MR imaging of the lumbar region clearly demonstrated that epidermoid tumor can form and grow to symptomatic size within 14 years in an adult. Although the incidence is not high, we should be aware of the potential adverse complications of de novo epidermoid tumors in patients with persistent low back pain treated by repeated lumbar injection procedures.

**References**


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