Intracranial Epidermoid Tumor After Subcutaneous Lipoma Excision
—Case Report—

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Abstract

A 66-year-old man presented with complaints of numbness for the past 5 years and progressive motor weakness of the right leg for the previous 2 months. Magnetic resonance imaging revealed large intracranial and extracranial tumors in the frontoparietal region. Physical examination suggested the extracranial lesion was a subcutaneous lipoma, which had been partially resected 60 years before, connected to the intracranial lesion via a defect of the skull. Gross total removal of the tumors was performed. Histological examination showed the intracranial lesion was epidermoid tumor, and connected to the extracranial lipoma by a lipoma bridge. The symptoms improved remarkably following surgery. This case of intracranial epidermoid tumor associated with intra-extracranial lipoma indicates that implantation of skin tissue in childhood carries the risk of epidermoid tumor even after several decades. Neuroimaging screening is recommended to detect the development of any intracranial components.

Key words: epidermoid tumor, iatrogenic tumor, lipoma

Introduction

Epidermoid tumor is a rare congenital lesion, accounting for approximately 1% of all intracranial tumors. Iatrogenic epidermoid tumors are rare, but intraspinal examples have been associated with the transfer of cutaneous epithelium fragments to the subarachnoid space during diagnostic procedures such as lumbar puncture. Epidermoid tumors are slow growing, so the symptoms may only develop 3–12 years after lumbar puncture. Only one case of iatrogenic intracranial epidermoid tumor has occurred after multiple percutaneous subdural aspirations.

We describe an intracranial epidermoid tumor which developed more than 50 years after partial removal of a subcutaneous lipoma connected to an intracranial lipoma.

Case Report

A 66-year-old man presented with a history of right leg numbness persisting for 5 years and motor weakness of the right leg for the past 2 months. The patient at age 5 years had undergone partial removal under local anesthesia of a subcutaneous mass present at birth in the midline parietal region. Brain magnetic resonance (MR) imaging revealed a large intracranial and extracranial tumor in the frontoparietal region at a community hospital. He was referred and admitted to our hospital.

Physical examination detected a soft subcutaneous mass measuring 3 × 3 cm, with no hair on its surface (Fig. 1). The mass did not change with pulsation or posture, and no operative scar was evident.

Fig. 1 Photograph showing a subcutaneous mass without hair in the mid parietal region.
Intracranial Epidermoid and Intra-Extracranial Lipoma

T₁- and T₂-weighted brain MR imaging demonstrated a well-circumscribed mixed intensity tumor, located across the bilateral frontoparietal regions, but mainly in the left parietal lobe and extracranial space (Fig. 2). T₁-weighted MR imaging with gadolinium showed no enhancement. Computed tomography (CT) showed a bone defect in the midline parietal area (Fig. 3). Cerebral angiography showed compression of the superior sagittal sinus in the parietal region without tumor stain.

Gross total resection of the tumor was performed under motor evoked potential (MEP) and somatosensory evoked potential (SEP) monitoring. The subcutaneous tumor was connected to the intracranial tumor by a lipomatous stalk via a midline defect of the skull and dura mater (Fig. 4). The intracranial tumor was observed under the dura mater with a capsule that was thin on the surface and whitish and thick in the deep portion of the tumor, and adhered to the brain tissue. The intracapsular part was soft and keratinous, and easily removed. However, a small part of the capsule adhered tightly to the brain tissue and was left intact to preserve motor function. The superior sagittal sinus was not invaded by the tumor, and the skin attached to the tumor was resected and repaired. Both MEP and SEP monitoring were normal during the procedure.

Histological examination demonstrated that the subcutaneous and connecting intracranial parts of the tumor were lipoma consisting of mature adipose tissue, whereas most of the intracranial tumor was epidermoid cyst containing a keratinous component, but no hair or cutaneous tissue (Fig. 5).

The patient’s right motor weakness and sensory disturbance improved markedly after the surgery, with the exception of some numbness of the right sole. Follow-up MR imaging detected no evidence of recurrence after 2 years.
Discussion

The present case of epidermoid tumor connected to intra-extracranial lipoma was extremely unusual. Intra- and extracranial components are likely to connect via a bone defect, usually at the midline of the cranial bone.\(^1,2,5,13\) Intracranial lipoma is a rare lesion that accounts for 0.46–1% of intracranial tumors.\(^10\) Only four cases of interhemispheric lipoma connected to subcutaneous lipoma via a bone defect in the anterior fontanel\(^2,5,13\) and midline parietal bone\(^11\) have been reported in infants. A previous case of cerebellopontine angle lipoma extending to the extracranial space involved a defect in the petrous ridge,\(^7\) and a lipomatous stalk was identified between an interhemispheric lipoma and subcutaneous tissue in a 9-week-old boy.\(^5\) In our case, a lipomatous stalk connected the intra- and extracranial parts of the tumor via a bone defect in the midline parietal region. The intracranial lipoma and epidermoid adhered to each other, and most of the intracranial component was epidermoidal.

Iatrogenic intraspinal epidermoid tumors were first reported in five children who had undergone repeated lumbar puncture for tuberculous meningitis 3–7 years before, as absence of a stylet enhanced the implantation of epithelial cells into the spinal canal.\(^3\) Experimentally, intraspinal epidermoid tumors were induced in 89% of young rats following skin implantation, although the procedure failed to generate epidermoid tumors in adult rats.\(^15\) The incidence of iatrogenic epidermoid tumors as a late complication of lumbar puncture decreased with the introduction of small disposable needles and stylets. Posterior fossa dermoid cysts associated with dermal sinus have been reported in pediatric cases, and early surgical treatment was necessary to prevent bacterial infection through the dermal sinus.\(^9\) Only one case of intracranial epidermoid tumor caused by coring of skin tissue has occurred in a patient who underwent multiple subdural taps through coronal sutures at the age of 6 months, and a large epidermoid cyst developing in the right frontal lobe was resected almost 25 years later.\(^6\)

In our case, the connection between the subcutaneous and interhemispheric lipomas may have been formed by implantation of skin tissue into the intracranial space during partial removal of the subcutaneous lipoma in childhood. The procedural details of the first surgery, performed more than 60 years before, were not clear. The cranial diploe around the bone defect did not change, indicating that the epidermoid tumor had not originated from this structure. Coring of skin tissue in childhood is consistent with the generative mechanism of epidermoid tumors. Dermal sinus was not observed, and the patient had no history of meningitis. The epidermoid cyst included keratinous component, and the tumor had a capsule.

The present case suggests that implantation of skin tissue in childhood carries the risk of epidermoid tumor even after several decades. Our hypothesis is supported by the case of an acquired intraspinal epidermoid tumor detected 15 years after repair of a lipomeningocele.\(^14\) We recommend that removal of subcutaneous lipoma in infants should be followed up with CT or MR imaging screening to detect the development of any intracranial components.

References

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