CASE REPORT

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Epidermoid Cyst Arising from the Corpus Callosum

Dok Ryong Kim, M.D., Hee In Kang, M.D., Jae Hoon Kim, M.D., Joo Seung Kim, M.D.

Department of Neurosurgery, Eulji University School of Medicine, Seoul, Korea

Most of intradural epidermoid cyst arise as slowly growing extraaxial lesions but purely intracerebral epidermoid cysts are rare. A 39-year-old female presented with a headache during several months. Brain computed tomography (CT) scan showed a mass lesion in the both frontal lobe with heterogenous density approximately 5×5cm in size. Magnetic resonance imaging (MRI) revealed a mass of heterogenous signal intensity on T1, T2-weighted image and faint enhancement with gadolinium (Gd). Through the both interhemispheric approach, mass was removed subtotally except the calcified portion tightly attached to the corpus callosum. The patient discharged without neurological deficit. The authors report a case of epidermoid cyst in the corpus callosum and discuss the pathogenesis of the intraparenchymal epidermoid cyst.

KEY WORDS : Epidermoid cyst · Corpus callosum.

Introduction

From the first description of the epidermoid cyst in 1807 by an artist in a French medical school[7], the intracranial epidermoid cyst is not a relatively uncommon disease enough to constitute 0.2% to 1.0% of all intracranial tumors[14]. However, purely intracerebral epidermoid cysts have been rarely reported no more than 2% of intracranial epidermoid cyst since Nehrkorn described for the first time in 1897[9,11]. Morever, epidermoid cyst arising from the corpus callosum occur very rarely, with less than twenty cases reported in the literature[4,5].

Epidermoid cysts originate from inclusions of misplaced ectodermal embryonic tissue in the neural groove or its vicinity[1]. Common locations of the epidermoid cyst are the parapontine region, cerebellopontine angle, parapituitary region, middle cranial fossa, diploe, and spinal canal[12].

We report a case of intracerebral epidermoid cyst arising from the corpus callosum and discuss clinical, radiological, histopathological, and surgical feature with review of literature.

Case Report

A 39-year-old woman presented with a dull headache and tightness from both ear to chin during several months (The nature of headache was intermittent, deep-seated, and vaguely localized.). There were no neurologic deficits on the neurological examination.

Brain CT scan revealed a well-circumscribed lesion with mixed low and nodular high density in the interhemispheric fissure (Fig. 1). On MRI, axial T1-weighted, T2-weighted, and sagittal T1-weighted images showed heterogeneous signal intense mass in the interhemispheric fissure and Gd enhanced MR axial image showed faintly enhanced mass. Both frontal lobe and corpus callosum was compressed and displaced (Fig. 2).

Surgery was performed through the both interhemispheric approach. The dura mater revealed no thickening. After the incision of dura and corticotomy, yellowish white surface of the tumor was revealed. The tumor mea-

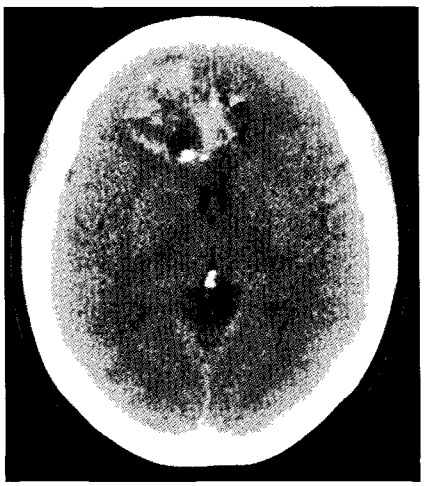

Fig. 1. Precontrast computed tomographic scan showing a mixed density mass in the interhemispheric fissure and both frontal lobe.

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• Address for reprints : Hee In Kang, M.D., Department of Neurosurgery, Eulji University School of Medicine, 280 Hagye-dong, Nowon-gu, Seoul 139-711, Korea Tel : +82-2-970-8268, Fax : +82-2-979-8268, E-mail : khi2303@hanmail.net

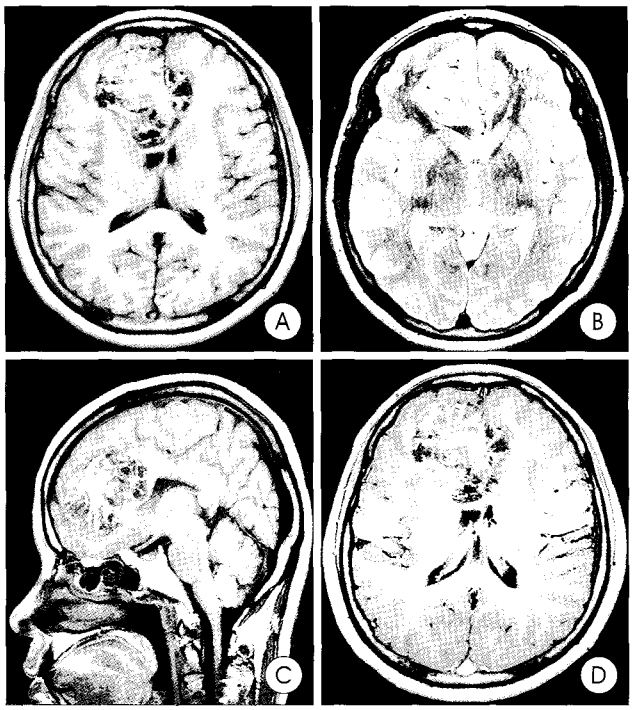

Fig. 2. Axial T1-weighted (A), T2-weighted (B), and sagittal T1-weighted (C) magnetic resonance images demonstrating a mass lesion of heterogeneous signal intensity in the interhemispheric fissure and faint enhancement with gadolinium (D).

Fig. 3. Microphotograph demonstrating an epidermoid cyst lined by maturing and keratinizing stratified squamous epithelium (arrow) and squames (arrow head), which is formed from degenerative keratinocytes (H&E, ×200).

sured about 50×50×49mm in dimension and contained a soft, cheesy, and yellowish white material. The tumor was removed subtotally except some capsule and the cacified portion tightly attached to the corpus callosum.

Histopathological findings revealed epidermoid cyst lined by maturing and keratinizing stratified squamous epithelium. The cyst contains squames, which is formed from degenerate keratinocytes (Fig. 3). Postoperative course was unremarkable. The patient was discharged without postoperative neurologic deficit

Discussion

The pathogenesis of epidermoid cyst is explained as primarily a gastrulation dysembryogenesis resulted from secondary disruption of neural tube closure during the 3rd to 5th week of embryogenesis[6]. Epidermoid cysts are generally considered to be congenital malformations rather than true neoplasm and have no gender preponderance[13]. Epidermoid cysts are usually clinically silent at birth and arise as slow-growing mass with linear rate as a result of desquamation of normal cells into a cystic cavity being different from most tumors with exponential growth. Therefore, clinical symptoms are begun from the middle age to 50 opening part and period to diagnosis is average 4 years, but is various from several months to several decades[2].

Epidermoid cysts commonly occur in the cerebellopontine angle or the parasellar region. However, supratentorial cerebral epidermoid cysts are relatively rare[6]. The clinical symtom of epidermoid cyst is usually originated in chemical irritation by cholesterol or keratin leaking out from the capsule or cranial nerve irritation cause by displaced vascular pulsation due to tumor growth[16]. The Symptoms vary according to the location and seizure is the most common symptom which is seen in about half degree of patients[7].

Most epidermoid cysts show an irregular shape on MR images with slightly higher signal intensity than cerebrospinal fluid on T2-weighted images with a characteristic marbled inner pattern on T1-weighted images. Gd enhanced T1 weighted images revealed either no or thinned rim-enhancement[8].

The ideal treatment of epidermoid cysts is the complete excision of both the cyst lining and its contents. Nevertheless, the location and extent of the tumor may limit radical excision which may result in significant morbidity and mortality[7]. Therefore, it is advocated that complete resection is unwise and should be avoided when their adhesive nature to surrounding tissue involving important structure make it impossible[2]. Mohanty et al.[10] suggested that subtotal resection with conservation of external capsule adhered to brain stem or cranial nerve is more desirable method reporting serious postoperative complication after complete resection. In our case, most of the tumor was removed except small part of the capsule which was firmly adherent to surrounding structures. Subtotal resection may have some disadvantages compared with complete resection : increased risk of recurrence rate, aseptic chemical meningitis, malignant transformation, etc. However, patient may not become problematic during the life span, because theoretically period until the tumor cell re-grow from membrane and reveal symptoms is time that add 9 months at patient's age[3,15,16].

The cyst contents, rich in cholesterol and fatty acids, are highly irritating to the meninges. During the surgical resection

of cysts, these contents can leak into the CSF pathway, and that may cause aseptic meningitis[2]. It can be often prevented by careful dissection of capsule with less spillage of their contents, use of hydrocortisone irrigating solutions during operation and gradual tapering of steroids for several weeks[2].

Conclusion

Epidermoid cysts arising from the corpus callosum are extremely rare and this is the first documented case in domestic. Surgical resection of tumor is only curable treatment. Although the ideal treatment of epidermoid cysts is the complete excision, we suggest that subtotal resection should be considered when it is firmly adherent to surrounding structures.

References

1. Acciarri N, Padovani R, Foschini MP, Giulioni M, Finizio FS : Intracranial squamous cell carcinoma arising in an epidermoid cyst. **Br J Neurosurg** 7 : 565-569, 1993
2. Berger MB, Wilson CB : Epidermoid cysts of the posteror fossa. **J Neurosurg 21** : 1051-1058, 1984
3. Cho JN, Kim SH, Kim KT, Kim Y : A case of epidermoid cyst with intractable tigeminal neuralgia. **J Korean Neurosurg Soc 21** : 442-448, 1992
4. Committee of the Brain Tumor Registry of Japan : Special report of Brain Tumor Registry of Japan (1969-1990). **Neurol Med Chir (Tokyo) 39** : 59-107, 1999
5. Furuhata S, Yamada F, Fukuda S, Otani M, Toya S : Epidermoid cysts of the callosal region three case reports. **Neurol Med Chir (Tokyo) 33** : 697-699, 1993
6. Gormley WB, Tomecek FJ, Qureshi N, Malik GM : Craniocerebral epidermoid and dermoid tumours : a review of 32 cases. **Acta Neurochir 128** : 115-121, 1994
7. Guidetti B, Gagliardi FM : Epidermoid and dermoid cysts. Clinical evaluation and late surgical results. **J Neurosurg 47** : 12-18, 1977
8. Hakyemez B, Aksoy U, Yildiz H, Ergin N : Intracranial epidermoid cysts : diffusion-weighted, FLAIR and conventional MR findings. **Eur J Radiol 54** : 214-220, 2005
9. Iaconetta G, Carvalho GA, Vorkapic P, Samii M : Intracerebral epidermoid tumor : a case report and review of the literature. **Surg Neurol 55** : 218-222, 2001
10. Mohanty A, Venkatrama SK, Rao BR, Chandramouli BA, Jayakumar PN, Das BS : Experience with cerebellopontine angle epidermoids. **Neurosurgery 40** : 24-30, 1997
11. Nehrkorn H : Ein Fall von meningealer Perlgeschwultst. Beiter. **Path Anat 21** : 73-81, 1987
12. Netsky MG : Epidermoid tumors; review of the literature. **Surg Neurol 29** : 477-483, 1988
13. Niikawa S, Hara A, Zhang W, Sakai N, Yamada H, Shimokawa K : Proliferative assessment of craniopharyngioma and epidermoid by nucleolar organizer region staining. **Childs Nerv Syst 8** : 453-456, 1992
14. Russel DS, Rubinstein LJ : **Pathology of tumours of the Nervous system**, ed 4. Williams and Wilkins, 1977, p448
15. Samii M, Tatagiba M, Piquer J, Carvalho GA : Surgical treatment of epidermoid cysts of the cerebellopontine angle. **J Neurosurg 84** : 14-19, 1996
16. Yasagil MG, Abernathey CD, Sarioglu AC : Microneurosurgical treatment of intracranial dermoid and epidermoid tumors. **Neurosurgery 24** : 561-567, 1989