CASE REPORT

Non-traumatic intradiploic arachnoid cyst with growing swelling on the frontal lobe

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BACKGROUND: The intradiploic arachnoid cysts are rare entities, which are generally post-traumatic and occur mostly in occipital region.

CASE DESCRIPTION: A 64-year-old woman was diagnosed with nontraumatic intradiploic arachnoid cyst. Her complaint was growing swelling on the forehead three years ago. As the operative findings, the small dural defect was recognized and arachnoid tissue in the cyst wall. Extradural intracranial arachnoid cyst without trauma is very rare.

DISCUSSION AND CONCLUSION: The intradiploic arachnoid cysts are thought to occur due to small defects in the dural membrane. Therefore, it seems that the region of the intradiploic arachnoid cysts depend on that of the dural membrane defects.

Key Words: *Negative-Pressure Wound Therapy (NPWT); VAC therapy; Wound care; Innovation; Economic; Chronic wound*

INTRODUCTION

Intracranial arachnoid cyst, which usually exists in the intradural region, is sometime found on magnetic resonance imaging (MRI), and is counted for only 1% of all intracranial space-occupying lesions (1-9). Spinal arachnoid cyst and extradural arachnoid cyst are even rare, and approximately one hundred cases have been reported. The most (95%) of the reported cases occurs in the thoracic and cervical regions of the spine (10-15). Especially non-traumatic intradiploic arachnoid cysts, which occur in the cranium, have been shown only in a few reports (1-6,8-12,13-18) and twenty cases were found in these reports. In this report, we report one patient with non-traumatic arachnoid cyst and estimate the etiology.

CASE REPORT

A 64-year-old woman visited our department because of a slow, hard, growing swelling in the left frontal region. She had noticed the swelling with small size 3 years ago, and it was gradually growing. There was no history of head trauma. Physical and neurological examination found no abnormalities except for a left frontal swelling with a 4 cm diameter. Plain skull x-ray films showed osteolytic lesion, with smooth, well-defined margine in the left frontal bone (Figure 1a).

Computed Tomographic scans (CT) revealed a low-density intradiploic lesion and thinning of the inner and outer tables of the skull (Figure 1b).

Figure 1a) *Plain skull x-ray films showed osteolytic lesion, with smooth, well-defined in the left frontal bone.*

Magnetic resonance imaging (MRI) showed an intradiploic lesion appearing as isointense to the cerebrospinal fluid (CSF) on both T1 and T2 weighted images (Figure 1c).

Via a left coronal incision, the outer table of the frontal bone was exposed. It was thin and appeared to be eroded (Figure 2a).

After removing of the outer table, it was found that the cyst membrane existed, the inner table was partially lost and the small defect of dural membrane (the defect size about 2 mm) was on the inner table defect, through which CSF leaked out (Figure 2b).

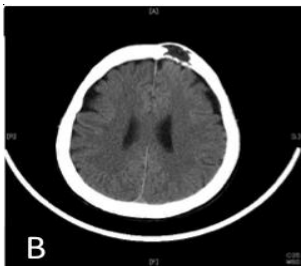

Figure 1b) *CT scans revealed a low-density intradiploic lesion and thinning of the inner and outer tables of the skull.*

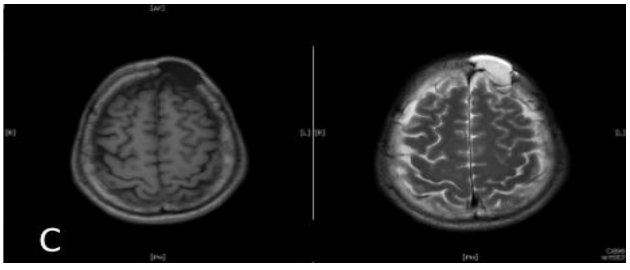

Figure 1c) *MRI showed a cystic lesion appearing as isointense to the cerebrospinal fluid (CSF) on both T1 and T2 weighted images.*

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Figure 2a) *Outer table was thin and appeared to be eroded.*

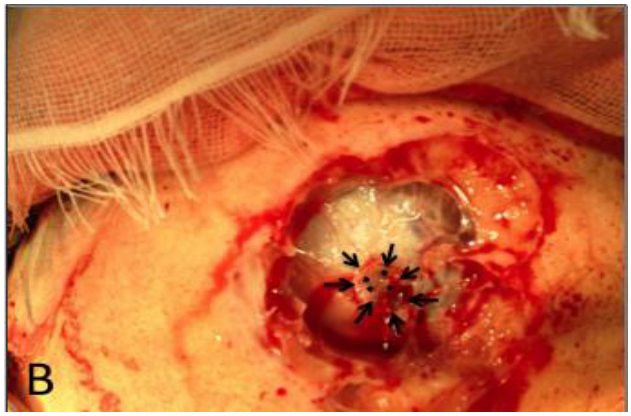

Figure 2b) *The inner table and the dural membrane was defect through which CSF leaked out. The dot line circle indicates the dural membrane defect, and the area where is surrounded by arrows indicates the inner table defect.*

After the resection of the cyst wall, the dural defect was closed with fascia and the bone defect was reconstructed with hydroxyapatite. Postoperative course was uneventful. On pathological examination the cyst wall consisted of arachnoid tissue. And fusiform cells and inflammatory cells were observed there. Therefore, we diagnosed her disease as intradiploic arachnoid cyst without head trauma.

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DISCUSSION

The diverticulum of the arachinoid membrane occurs through the small defect of the dura membrane and makes the extradural arachnoid cyst. The continuous pulsation of CSF erodes the inner layer of the cranium and may expand the intradiploic space, where there is no resistance compared with the inner or outer layers of the cranium. Approximately 100 cases of extradural arachnoid cyst have been reported, but most of them are in the spinal cord and occipital bone (3,13). We talk about the extradural arachnoid cyst which exists on the convexity of the cranium. When the extradural arachnoid cysts with the cyst edge in contact with or passing through the midline of the cranium would be defined as the arachnoid cyst associated with the midline, 13 of the reported cases (13 / 18 cases) were the arachnoid cysts on convexity associated with the midline (Table 1). The distribution of the lesion may depend on the location of the dural membrane defects, which suspected the relation to the congenital factors, including the cephalocele (1-7). And then if the extradural arachnoid cyst would be on the skull base, this lesion might be recognized as the CSF leakage. The majority of the extradural arachnoid cyst occurs in the thoracic and cervical regions (1-3), which may also indicate the location of the dural membrane defects. It has been reported that CSF leakage points in the spine.

Table 1

Summary of patients with intradiploic arachnoid cysts on convexity.

Author (Year)	Age	Sex	Location	Contact of the cyst margin to the midline	Symptoms
Alfieri at al. (1996)	57	F	Lt. Frontal	No	Local pain
Asahi et al. (1998)	63	M	Rt. Parietal	No	No
D'Almedia et al. (1981)	61	M	Rt. Parietal	Yes	No
	53	M	Rt. Frontal	Yes	No
Garg et al.(2013)	16	F	Occipital	Yes	No
Hasegawa et al. (1992)	54	F	Occipital	Yes	No
	70	F	Occipital	Yes	No
	58	F	Occipital	Yes	No
	71	M	Occipital	Yes	No
	74	F	Occipital	Yes	No
Iplikcioglu et al. (2006)	65	F	Rt. Fronto temporal	No	Swelling
Krupp et al. (1999)	30	M	Rt. Frontal	Yes	Swelling
Luyuan et al. (2017)	5	F	Bi. Frontal	Yes	Seizure-like activity
Saida et al. (2016)	40	M	Rt. Parietal	No	Swelling
Weinand et al. (1989)	70	F	Lt. Parieto occipital	No	Local pain
	68	F	Occipital	Yes	Local pain
Yamaguchi et al. (2002)	72	F	Occipital	Yes	No
Our Case	64	F	Lt. Frontal	Yes	Swelling

Eight patients of 17 cases and our case present the subjective complaints, which may be thought due to the speed of growing of the intradiploic arachnoid cysts. In these cases, there may be the bulb function between the intradiploic arachnoid cyst and the intracranial arachnoid space, and may induce the high pressure, and the expansion of the cyst (9-18).

CONCLUSION

The relative quick expansion of the intradiploc arachnoid cysts may induce the symptoms. Although cranioplasty is commonly used as a treatment, it is thought that the repair of dural membrane defects is also important when considering the developmental mechanism.

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