
症 例

Retrocollicular Arachnoid Cyst with the Inferior Sagittal Sinus Anomaly and the Corpus Callosum Dysgenesis

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Received for Publication, Sept. 29, 1985.

Summary

A patient with a retrocollicular arachnoid cyst associated with anomalies of inferior sagittal sinus and posterior corpus callosum is presented. A brief discussion about the cause of this rare association is made.

Introduction

The inferior sagittal sinus usually begins near the junction of the anterior and middle third of the falx and runs posteriorly along the free margin of the falx into the straight sinus. Anomaly of the inferior sagittal sinus is poorly known^{8,10,12}. Rarely the middle third of the inferior sagittal sinus may be absent, poorly developed, or fenestrated. In this paper, we present a patient with retrocollicular arachnoid cyst with anomalies of inferior sagittal sinus and corpus callosum.

Case Report

This 34-year-old woman first visited our outpatient clinic with a complaint of left temporal pain in July, 1980. She hit herself on the left temporal region with a log in November, 1979. Since then she had been complaining of dull headache in that region. CT scan disclosed a retrocollicular cystic mass. But further examination was refused. She again visited our clinic because of dizziness and feeling of tension in her left cheek, which started in July, 1982. She entered our hospital in February, 1983.

Examination on admission disclosed that she had disturbance of upward gaze of the right eye, paresthesia of the second and third divisions of the left trigeminal nerve, bilateral horizontal

Key words: retrocollicular arachnoid cyst, inferior sagittal sinus, splenium, anomaly.

索引語: 四丘体部クモ膜嚢胞, 下矢状静脈洞奇形, 脳梁形成不全

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Fig. 1.

Fig. 1. Computerized tomography scan demonstrating a moderate hydrocephalus and a supracollicular cystic mass.



Fig. 2.

Fig. 2. Metrizamide CT cisternography.

Metrizamide was filled into the supracollicular cistern, and surrounded the cystic mass.

nystagmus which was smaller and more frequent in the left. CT scan showed mild hydrocephalus with a retrocollicular arachnoid cyst which became larger than the previous CT scan had shown. A metrizamide CT cisternography demonstrated a retrocollicular water density mass which was surrounded by the contrast material.

On angiogram, the inferior sagittal sinus was found to lack its posterior third and drained directly into the vein of Galen at the junction of internal cerebral veins. And the posterior pericallosal artery ran just parallel to the abnormal part of the inferior sagittal sinus.

An operation was performed on March, 1983. The splenium was not found. A small vein was found running from the inferior sagittal sinus around posterior margin of the corpus callosum into the proximal part of the vein of Galen. Further, there was a rudimentary small venous channel in the falx, corresponding to the posterior third of the inferior sagittal sinus. Arachnoid cyst was found under the tentorium, which was divided along the straight sinus. The outer membrane of the cyst was opened, and posterior third ventriculostomy was added. Ommaya's system was placed in the cystic cavity. If cystic fluid again collects in future, it will be easily aspirated through the Ommaya's valve.



Fig. 3. Cerebral venography.
The posterior third of the inferior sagittal sinus was absent and it drained directly into the vein of Galen at the junction of internal cerebral veins.

Postoperatively, her complaints have much improved. In fact, her nystagmus, paresthesia and restriction of the right eye movement have still continued. They, however, have decreased their severities.

Microscopic Examination

Histological examination disclosed that the biopsy specimen was compatible with the arachnoid cyst with mild inflammatory signs such as increased collagen fibers, hyalin degeneration and minimal infiltration of lymphocytes.

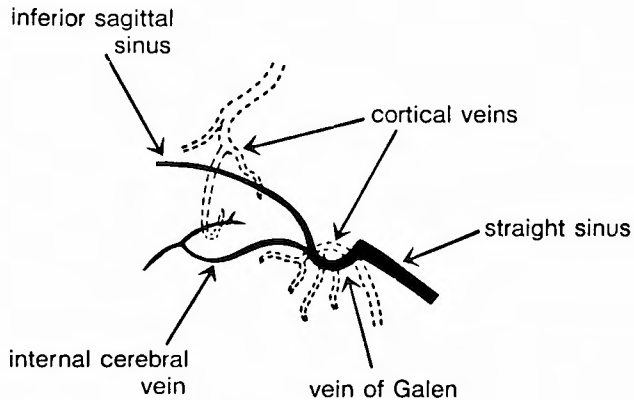


Fig. 4. Diagram of the venography.

Discussion

According to Padget¹³⁾, the sigmoid sinus is first formed at the 20 mm crown-rump stage. Formation of the tentorial plexus, which will become the Torcular in future, begins at the 22-24 mm stage, the cavernous sinus and inferior petrosal sinus at 40 mm stage, the superior petrosal sinus and the straight sinus at 60-80 mm stage. The tentorium and the straight sinuses first develop in a relatively vertical position, while it migrates backward and downward with the growth of the cerebral hemisphere. This migration stops when the crown-rump length becomes 90 mm (3 month fetus).

In relation to this tentorial angle, WOLPERT tried to classify the congenital anomalies¹³⁾.

The inferior sagittal sinus is formed by an anterior extension of the straight sinus after 3 month fetal stage.

The fibers forming the corpus callosum first become definite in the early half of the 3 month embryonal stage. The fibers gradually extend caudally. It is the 5 month fetus which has a completed corpus callosum. Bruce reported that developmental anomaly of the corpus callosum causes its agenesis before 4 month and dysgenesis after 4 month embryonal stage^{3,7)}. This case had an inferior sagittal sinus anomaly, corpus callosum dysgenesis, and a retrocollicular cyst which is known as a rare anomaly^{1,11)}. The anomaly of the inferior sagittal sinus appears to have some relationship at least with corpus callosum dysgenesis.

According to STREETER, venous sinus development requires two mechanism^{10,14)}. One is the passive migration due to some flexion or traction on the vein wall itself, and the other is the spontaneous migration, in which there is a change in position by the blood stream.

Following this theory, corpus callosum dysgenesis of this case would have had influence on the passive migration of the inferior sagittal sinus after 4 month fetus stage. The primary cause of the anomalies of this patient, however, by which the corpus callosum dysgenesis had occurred, is still unclear. It is unlikely that the retrocollicular arachnoid cyst would have interfered the formation of the posterior part of the corpus callosum. It is difficult to decide whether the cyst existed before birth or not^{2,4,6,11)}.

It is well known that corpus callosum agenesis sometimes has other anomalies or tumors such as lipomas or dermoids^{5,9,16)}. But there has been no report like this case. This case had three types of anomalies and it seems very interesting to us to consider the cause of the anomalies, though we can not decide definitely the relationship between the arachnoid cyst and other anomalies.

References

- 1) Alexander EJr: Benign subtentorial supracollicular cyst as a cause of obstructive hydrocephalus. Report of a case. *J Neurosurg* 1953; **10**: 317-323.
- 2) Anderson FN, Landig BH: Cerebral arachnoid cysts in infants. *J Pediatr* 1966; **69**: 88-96.
- 3) Bruce A: On the absence of the corpus callosum in human brain with description of new case. *Brain* 1890; **12**: 171.
- 4) Craig WM: Chronic cystic arachnoiditis. *Am J Surg* 1932; **17**: 384-388.
- 5) Danziger J, Bloch S, Van Rensburg MJ: Agenesis of the corpus callosum with an azygos anterior cerebral artery, a lipoma and porencephalic cyst. *S Afr Med J* 1972; **46**: 739-741.
- 6) Ghatak NR, Mushrush GJ: Supratentorial infraarachnoid cyst; case report. *J Neurosurg* 1971; **35**: 477-482.

- 7) Handa H, Handa J, Koyama T: Agenesis of the corpus callosum associated with multiple developmental anomalies of the cerebral arteries, report of a case and review of literature. No To Shinkei 1968; **20**(4): 317-326. (Eng. Abstr.)
- 8) Heinz ER: Pathology involving the supratentorial veins and dural sinuses. In: Newton TH, Potts DG, eds. Radiology of the skull and brain. Vol 2, book 3. St Louis: CV Mosby, 1974: 1894-1895.
- 9) Holman CB, MacCarty CS: Cerebral angiography in agenesis of the corpus callosum. Radiology 1959; **72**: 317-322.
- 10) Kaplan HA, Browder AA, Browder J: Atresia of the rostral superior sagittal sinus: associated cerebral venous patterns. Radiology 1972; **4**: 208-211.
- 11) Kuratsu J, Matsukado Y, Kodama T: Large infratentorial multilocular arachnoid cyst. Child's Brain 1983; **10**: 67-72.
- 12) MacCord GM, Goree JA, Jimenez JP: Venous drainage to the inferior sagittal sinus. Radiology 1972; **105**: 583-589.
- 13) Padget DH: The development of the venous system in man, from the viewpoint of comparative anatomy. Contrib Embryol 1957; **36**: 79-140.
- 14) Streeter GL: The development of the venous sinuses of the dura matter in the human embryo. Amer J Anat 1915; **18**: 145-178.
- 15) Wolpert SM: Dural sinus configuration: measure of congenital disease. Radiology 1969; **92**: 1511-1516.
- 16) Zingesser L, Schechter M, Gonatas N: Agenesis of the corpus callosum associated with an interhemispheric arachnoid cyst. Br J Radiol 1964; **37**: 905-909.

和文抄録

下矢状静脈洞奇形に四丘体部クモ膜嚢胞, 脳梁形成不全を合併した一例

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下矢状静脈洞の異常に関する報告は少なく, Myelomeningoale の中間部 1/3 の奇形や, 腫瘍等による shift が知られているにすぎない。我々は, 下矢状静脈洞後部 1/3 の奇形に, 脳梁不完全欠損, retrocollicular arachnoid cyst を合併した稀な症例を経験したので, その成因につき, 考察を加え報告する。

症例: 34才女性。昭和57年7月より左頬部のつばき感, dizziness が出現した。神経学的には, Bruns Nystagmus と左三叉神経第2~第3枝領域の paresthesia, 右眼の上方注視制限を認めた。CT scan にては, Hydrocephalus, retrocollicular cyst を認め, Metrizamide CT では cyst 内 delayed filling が確認できた。血管写上, 下矢状静脈洞は直接ガレン大静脈に注ぎ, 通常認められる後部 1/3 は欠損していた。以上よ

り脳梁形成不全に, 下矢状静脈洞奇形, retrocollicular arachnoid cyst が合併していると判明し, 水頭症及び脳幹部圧迫症状の原因となっている cyst に対し, 外膜の開放と, Ventriculostomy を行ない, 症状の改善をみた。

胎生期 dural sinus の形成は, passive migration と spontaneous migration によるとされる。また, 下矢状静脈洞は胎生3ヶ月以後, straight sinus が前方へ伸展することで形成され, 一方脳梁形成は胎生3~5ヶ月に行なわれる。従ってこの下矢状静脈洞奇形は, 脳梁形成不全により, 主に passive migration に変化をきたし生じたものと考えられる。また, 両者と retrocollicular arachnoid cyst の合併は非常に稀で, 興味深いものと思われた。