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

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CITATION:

ISSUE DATE:
1985-01-01

URL:
http://hdl.handle.net/2433/208668

RIGHT:
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 known8,10,12>. 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...
Fig. 1. Computerized tomography scan demonstrating a moderate hydrocephalus and a supracollicular cystic mass.

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 falk, corresponding to the posterior third of the inferior sagittal sinus. Arachnoid cyst was found under the tentrium, 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.
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.

![Diagram of the venography](image-url)
Discussion

According to Padget\textsuperscript{13}, 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 anomalies\textsuperscript{14}. 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\textsuperscript{3, 17}. This case had an inferior sagittal sinus anomaly, corpus callosum dysgenesis, and a retrocollicular cyst which is known as a rare anomaly\textsuperscript{4-12}. 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\textsuperscript{10, 11}. 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\textsuperscript{2, 4-6, 11}.

It is well known that corpus callosum agenesis sometimes has other anomalies or tumors such as lipomas or dermoids\textsuperscript{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


和文抄録

下矢状静脈洞奇形に四丘体部くも膜囊胞、脳梁形成不全を合併した一例

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下矢状静脉洞の異常に関する報告は少なく、Myelomenigoceleでの中間節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、下矢状静脈洞後節1/3の奇形に、脳梁不完全欠損、retrocollocicular 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月より左顔部のつっぱり感、dizzinessが出現した。神経学的には、Brun’s 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、retrocollocicular cyst を認めた。Metrazamide CTではcyst内delayed fillingを確認できた。血管写上、下矢状静脈洞は直接ガレン大静脉に注ぎ、通常認められる後節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、retrocollocicular 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を行う、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ヶ月に行われる。従ってこの下矢状静脈洞奇形は、脳梁形成不全より、主にpassive migrationに変化をきたし生じたものと考えられる。また、両者はretrocollocicular arachnoid cystの合併は非常に稀で、興味深いものと思われた。