Case Reports and Technical Notes

Spontaneous Cure of Intracavernous Aneurysm of the Internal Carotid Artery in a 14-Month-Old Child

Case Report

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The incidence of intracranial aneurysms in the general population is estimated to be less than 2%.<sup>3,4,14,16</sup> Aneurysms occurring below the age of 20 years are quite uncommon.<sup>1-3</sup> McDonald and Korb<sup>11</sup> in their collected series of 1125 intracranial aneurysms, noted that the youngest patient was 1½ years old. They had only 28 patients younger than 15 years of age. Similarly, Taveras and Wood<sup>17</sup> found only four cases of intracranial aneurysms in patients under 15 years of age at the New York Neurological Institute during a period of 14 years. Only a few cases of aneurysms in early childhood have been reported.<sup>6,7,11</sup> The intracavernous aneurysms account for about 3% of all intracranial aneurysms.<sup>3</sup>

In a country where the incidence of aneurysms is considered to be low,<sup>10</sup> the occurrence of an intracavernous aneurysm of the internal carotid artery in a child aged 14 months is certainly a curiosity. Apparently the spontaneous cure of an aneurysm of the internal carotid artery in a young child has not been reported.

Case Report

This 14-month-old boy was admitted to the Neurological Service of Christian Medical College Hospital, Vellore, on July 15, 1966. The child had been well until July 1, 1966, when he developed a high fever that lasted for 1 week. He was not unconscious during this period. A week after the onset of fever, his parents noticed swelling of the left eye and the eye lids. He then developed frequent left-sided seizures, with residual weakness on that side and swelling of the left eye.

Examination. The child appeared ill, irritable, and apprehensive. There was edema of eye lids, chemosis of the conjunctiva, and restriction of all ocular movements on the left side. There was no papilledema. There was a paresis of the entire left side including the face. Lumbar puncture and examination of cerebrospinal fluid revealed 6 cells/cu mm; protein was 25 mg% and sugar 50 mg%. An electroencephalogram obtained during sleep showed symmetrical slow waves of 1–2 cps over both hemispheres and an 8–12 cps activity superimposed on the slow waves. A left carotid angiogram (Fig. 1) revealed a large saccular aneurysm in the intracavernous part of the internal carotid artery, a faint outline of middle and anterior cerebral arteries, and marked orbital anastomosis between the internal carotid and external carotid arterial systems.

No definitive treatment was given as the parents were unwilling for an operation, and the child was discharged on August 5, 1966. During the follow-up it was noticed that the proptosis disappeared and the weakness on the left side improved.

Second Examination. The child was readmitted on May 14, 1968, at our request. He appeared well. There was no evidence of papilledema, and ocular movements were normal. No bruit was heard over the left eye. A repeat EEG was normal. The left-sided weakness was still present. A left carotid angiogram done under anesthesia showed complete obliteration of the previous saccular aneurysm, better filling of intracranial vessels, and evidence of internal and external carotid anastomosis (Figs. 2 and 3). Submentovertical view showed the connection between the external carotid arterial systems. Retrograde axillary catheterization and study of the vertebrobasilar system revealed significantly large vertebral and basilar and posterior communicating arteries (Fig. 4).

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Fig. 1. Left: Left carotid angiogram, lateral view, shows the large intracavernous aneurysm of internal carotid artery, faint outline of middle and anterior cerebral arteries, and orbital anastomosis. Right: Anteroposterior view shows the large aneurysm and faint outline of middle and anterior cerebral arteries. Note that the diameter of the middle cerebral artery is fairly large.

**Discussion**

With fever and subsequent ophthalmoplegia as the main symptoms, a diagnosis of infective cavernous sinus thrombosis was considered as well as the possibility of multiple abscesses. Demonstration of an aneurysm of the intracavernous portion of the internal carotid artery by the left carotid angiogram (Fig. 1) was the surprising finding. Matson\textsuperscript{11} in his report of 13 cases of aneurysms in children below the age of 15 years had four

Fig. 2. Left: Repeat left carotid angiogram, lateral view done during readmission shows the obliteration of saccular aneurysm of intracavernous portion of internal carotid artery. This area is represented as a narrow segment. Note the presence of communication between the internal and external carotid arterial system and relatively large size of middle cerebral artery. Right: Anteroposterior view of repeat left carotid angiogram shows the large middle cerebral artery and orbital anastomosis.
cases of internal carotid artery aneurysm, the youngest patient being 6 years 4 months old. Other cases of aneurysms in young children have involved the middle cerebral,\textsuperscript{6,7} posterior cerebral, posterior communicating,\textsuperscript{15} and posterior inferior cerebellar arteries.\textsuperscript{4} In two series\textsuperscript{5,9} dealing primarily with aneurysms of the intracavernous portion of the internal carotid artery, the youngest patient in each was 22 years of age. So far as we have been able to discover there has been no reported case of internal carotid artery aneurysm in a child as young as 14 months.

The clinical characteristics of aneurysms of the intracavernous portion of the internal carotid artery have been described in detail.\textsuperscript{5,13} In our case, the sudden onset of proptosis suggested an aneurysmal leak producing a carotid cavernous fistula. The absence of draining veins and persistence of contrast medium in all phases of angiogram was probably due to spontaneous sealing off of the fistulous communication. The presence of weakness and occurrence of seizures ipsilateral to the aneurysm could be explained on the basis of a steal of blood from the distribution of the right internal carotid artery. The abundance of anastomoses between the internal and external carotid arteries with a fairly large-sized middle cerebral artery seen even during the first admission

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\includegraphics[width=\textwidth]{image1.jpg}
\caption{Anteroposterior view of delayed film shows the rich intracranial vascular supply mainly through the collateral supply.}
\end{figure}

(Fig. 1) suggests the possible congenital origin of the aneurysm.

The complete obliteration of the aneurysmal sac with a markedly narrowed segment of internal carotid artery in the intracavernous portion is certainly an indication of spontaneous thrombosis of the aneurysm. Whether the left-sided hemiparesis is the re-

\begin{figure}[h]
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\includegraphics[width=\textwidth]{image2.jpg}
\caption{Retrograde right axillary artery catheterization and serial angiographic study shows the large right vertebral, basilar, posterior communicating, posterior cerebral, and middle cerebral arteries. Anteroposterior view (left) and lateral view (right).}
\end{figure}
sult of a steal of blood from the right side or due to existence of other anomalies involving primarily the right side was difficult to decide. Hence the study of the rest of the intracranial vessels was undertaken (Fig. 4). This has clearly ruled out any anomalies intracranially, other than the intracavernous aneurysm on the left side. The highly competent circle of Willis is quite evident from the angiogram (Fig. 4), which shows filling of both middle cerebral arteries and significantly large posterior communicating arteries.

**Summary**

We have reported the spontaneous thrombosis of an intracavernous aneurysm of the left internal carotid artery in a 14-month-old boy. Although sudden onset of ophthalmoplegia suggested a temporary carotid cavernous fistula, the abundant collateral blood supply to the brain even in the first angiogram indicated the probable congenital nature of the lesion.

**Acknowledgments**

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**References**