Normal Angiographic Configuration of Carotid Siphon in the Pediatric Patient

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In the infant and in the young child the distal portion of the carotid siphon and the first portion of the anterior cerebral artery have a configuration which is different from that observed in the adult. If one is not aware of this peculiarity in the child he can be misled and make a diagnosis of an abnormal angiogram when confronted with what is really a normal contrast study. Because this fact does not seem to have been recognized in the American literature we were prompted to write this note.

This peculiarity of the siphon and of the anterior cerebral artery can be described as follows:

Anteroposterior Projection. The first portion of the anterior cerebral artery arches upward describing an arc with an inferior concavity (Fig. 1).

Lateral Projection. The distal portion of the carotid siphon is straighter and extends farther upward in comparison with the configuration in the adult. The first portion of the anterior cerebral artery appears "stretched out" as compared with the pattern in an adult (Fig. 2).

Both lateral and anteroposterior projections thus suggest the angiographic picture that one sees in the adult when a small suprasellar mass is present.

In the papers written by Taveras and Poser, by Poser and Taveras, and by Ingram and Matson, this configuration is seen clearly in some of their illustrations, but they have not commented upon this appearance which is usually normal only in the young child.

In the newly published L'Angiographie de l'Artère Carotide Interne Chez le Sujet Normal by D. Dilenge, he not only emphasized this peculiarity of the siphon in children but also presented a good illustration. A similar observation has been made in 7 angiograms which have been performed at the Children's Memorial Hospital (service of Dr. L. V. Amador) and in 5 performed at the Chicago Wesley Memorial Hospital (service of Dr. P. C. Bucy). These patients were all under the age of 4 years. Five of the patients from the Children's Memorial Hospital were younger than 1 year.

Because of the fact that our experience is limited to a small number of cases more detailed information as to the evolution of this appearance to the adult configuration is not available. It has been our impression, however, that this straightening of the siphon is more pronounced in the younger than in

Fig. 1A. Anteroposterior projection of left carotid angiogram in a 4-year-old child demonstrates the normal configuration of the siphon in young children and infants, which is often characterized by the first portion of the anterior cerebral artery slanting upward as it passes medially. (See also Fig. 1 B, C)
Normal Angiogram of Carotid Siphon in the Young

Fig. 1. (B) Drawing of "infant type" of carotid siphon (as seen in Fig. 1A) to be compared with (C) which is a drawing of the "adult type" of carotid siphon.

Older children. Probably the adult configuration usually is attained soon after the age of 4, but we have seen this in children as old as 8 years. Two of our recent patients, not included in the above-mentioned series, were 4½ and 5½ years old, respectively. In these 2 cases the siphon exhibited its usual "adult" pattern. In a case included in this series (aged 2 years) the lateral projection shows the "infant" pattern (Fig. 3) but in the anteroposterior projection the "adult" one is seen (Fig. 4). This was also true in an 8-year-old boy. The patient whose radiographs are shown in Figs. 1 and 2 is a 4-year-old girl who was admitted to the hospital with the history of a subsiding left hemiparesis subse-

Fig. 2. Lateral projection of left carotid angiogram. The elevation and elongation of the internal carotid artery above the anterior clinoid process is obvious. Same patient as in Fig. 1. Arrows emphasize the "infant pattern" of the carotid siphon.

Figs. 3 and 4. Lateral and anteroposterior projections of right carotid angiograms in a 2-year-old child. "Infant pattern" is seen in the lateral projection, and the usual "adult" configuration in the anteroposterior projection.
quent to a left Jacksonian seizure. On clinical examination no defect in the visual fields was found. Plain films of the skull were normal and in particular they revealed a perfectly normal sella turcica. An electroencephalogram showed some slowing over the left temporal lobe. A pneumoencephalogram was done and it was found to be entirely normal. She made a complete recovery and is well.

Figs. 3 and 4 represent the angiograms of a 2-year-old boy who had recovered from an influenzal meningitis except for a persisting low-grade spiking fever. Neurological findings as well as plain roentgenograms of the skull were unremarkable. Results of repeated lumbar punctures were normal consistently. An air study was not performed. A diagnosis of otitis media was made and the fever subsided under antibiotic treatment.

Summary
In the infant and the young child the carotid siphon and the first portion of the anterior cerebral artery normally give an angiographic picture which is quite similar to the one observed in an adult harboring a small suprasellar mass.

References