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Cerebral Varix and Probable Venous Angioma: An Unusual Isolated Anomaly

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A patient with headaches was found at angiography to harbor a venous saclike aneurysm unassociated with any evidence of arteriovenous shunting. Computed tomographic (CT) and angiographic findings are described. No previous report with similar radiographic findings has been found.

Case Report

A 31-year-old man came to the Veterans Administration Medical Center after 3–4 years of right frontal headaches that had been increasing in frequency and intensity. No other complaints were noted. There was no history of migraine and family history was unremarkable. Physical examination including neurologic testing was completely normal. Initial CT examination (not shown) was suspicious for an intracranial aneurysm, and an arteriogram was obtained (fig. 1). The arterial phase on the right side was normal in appearance. Appearing late in the venous phase was a smooth, round, saclike vein that drained a portion of the caudate nucleus and lateral basal ganglia on the right side, and emptied by way of a large single vessel into the sylvian venous system. The appearance of several of the small veins draining the lateral basal ganglia and emptying into the sac was noted. A lateral scout film after the anteroposterior film sequence (the examination was partly performed in a single plane system) revealed persistent opacification of this saclike vessel for several minutes. Subsequent higher resolution CT examination (fig. 2) on the General Electric 8800 scanner revealed a rounded lesion of minimal hyperdensity on the noncontrast portion that enhanced considerably after contrast administration. The two major vessels draining into this venous sac were also noted and corresponded to angiographic changes. In addition, the caudate nucleus and a part of the lateral basal ganglia appeared to enhance somewhat more than the opposite side. The examination revealed on both sides and in the posterior circulation no evidence of arteriovenous malformation or any other vascular abnormality. There was no sign of vasculitis. The patient was treated conservatively and no operation was performed.

Discussion

Nonneoplastic vascular malformations can be generally classified into five categories as described by McCormick [1]. This classification includes telangiectasias, varix, cavernous malformation or angioma, arteriovenous malformation, and venous malformation. The classification used by Russell and Rubinstein [2], summarized by Wendling et al. [3], and cited by others [4–8], deletes the category of varix. In a comprehensive review by Noran [9], cerebral varix is discussed at length with descriptions of cases reported much earlier. Included in these descriptions are those composed of lesions containing more than one abnormal vein. These might possibly have represented arteriovenous malformations. However, there are well documented cases in which a single large vessel was encountered as an isolated phenomenon; that is, one not associated with arteriovenous malformation at necropsy [10–13]. These varices demonstrated a tendency to rupture, but the true likelihood of rupture was not known. Noran reported no specific site of predilection and a tendency for association with a dural sinus. Histologically, a relatively large, thin-walled vessel was found, usually lined by a single layer of endothelium and circled by a single layer of thin connective tissue. Muscle fibers and elastic tissue were generally absent.

Arteriographic examination on these cases from the earlier literature and from the three cases added by Noran is unavailable. Cushing and Bailey [14] clearly described a large, isolated varix and categorically separated it from lesions composed of multiple veins, arteries and veins, or telangiectasis.

The etiology of the varix has been only speculative and authors appear to be unsure in even classifying the abnormality. It appears to be a rather uncommon entity. No association with the more typical venous angioma, now well described in the literature [4–8, 15–27], has been noted. Our case appears to have some characteristics suggesting that it may represent a variation of venous angioma. The caudate nucleus and lateral basal ganglia are slightly hypervascular, and this hypervascularity in turn is related to prominent veins seen both on angiography and CT. These veins drain into the varix, which then empties into the sylvian group of vessels, part of the superficial venous system. One

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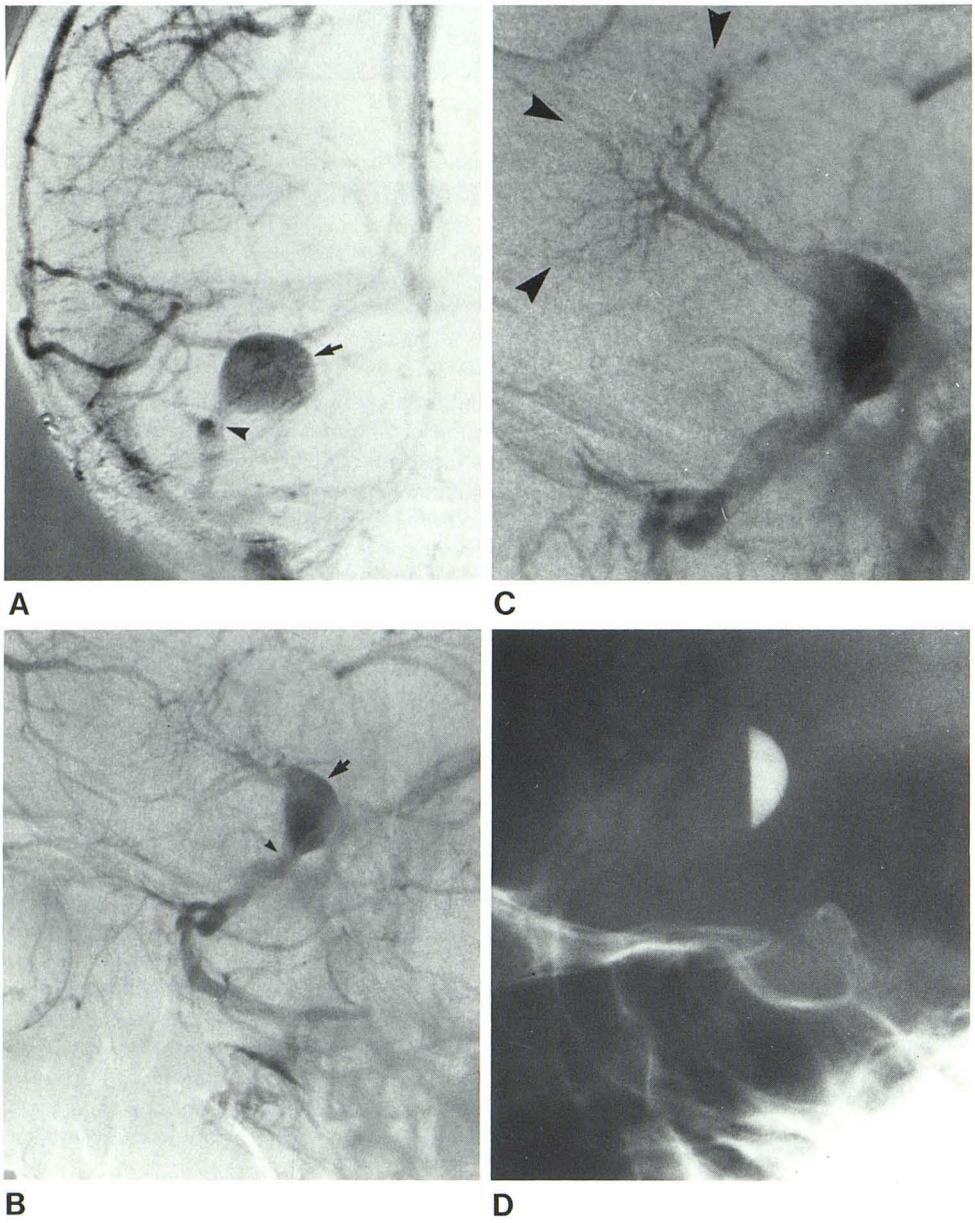

Fig. 1.—Anteroposterior (**A**) and lateral (**B**) angiograms. Venous phase of right-sided injection reveals rounded saclike venous aneurysm (*arrows*) and drainage by way of large single vein (*arrowheads*) into sylvian venous system. **C**, Slightly oblique and enlarged. Several prominent small vessels (*arrowheads*) draining into venous aneurysm are suggestive of venous angioma. **D**, Lateral scout film before injection of opposite carotid. Persistent contrast in lower part of venous aneurysm has a prominent semilunar shape.

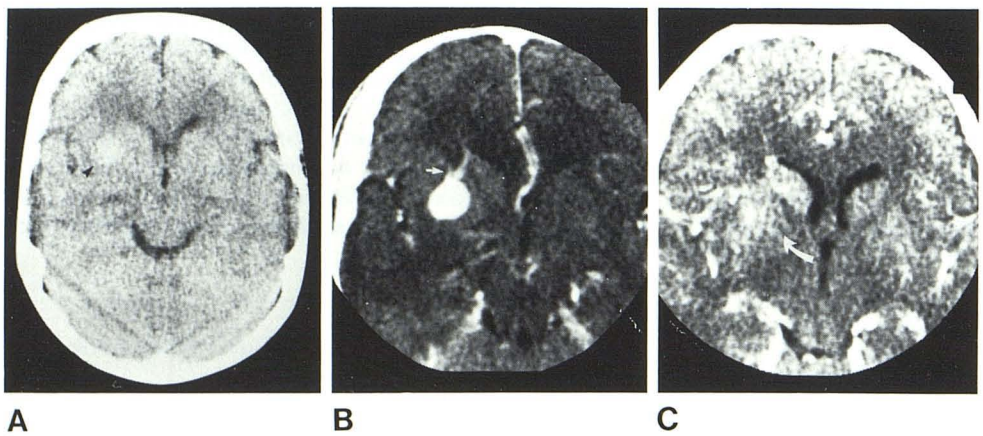

Fig. 2.—**A**, Noncontrast scan through venous aneurysm (*arrowhead*). **B**, After administration of contrast material. Dense enhancement of aneurysm and visualization of two major veins entering it (*arrow*). **C**, Just above venous sac. Somewhat increased enhancement in right caudate nucleus and in lateral basal ganglia, excluding thalamus (*arrow*).

would expect the basal ganglia drainage to be into the deep system. On the angiogram several prominent veins appear to be related to the varix, but their appearance is not wholly typical of venous angioma: they are relatively fewer in number and do not present a collection of parallel channels, the "spoke-wheel" appearance often seen. The appearance also is not that of the cavernous angioma, which may demonstrate calcification, mass effect, occasional staining, and vascular pooling of contrast material, with possible dense enhancement on CT [28–37].

The findings in our case appear to clearly represent a cerebral varix. Association with a venous angioma has not been previously reported or noted by earlier authors. The evidence contained herein would suggest that the association of venous angioma and varix may be present.

Varices have been noted often with high-flow vascular malformations. They are the most prominent component of the vein of Galen fistula seen in children and occasionally adults and are noted uncommonly in the orbit.

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