

## Increased intracranial pressure resulting in a pulsatile aneurysm

### Case illustration

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**KEY WORDS** • intracranial pressure • pulsatile aneurysm • angiography

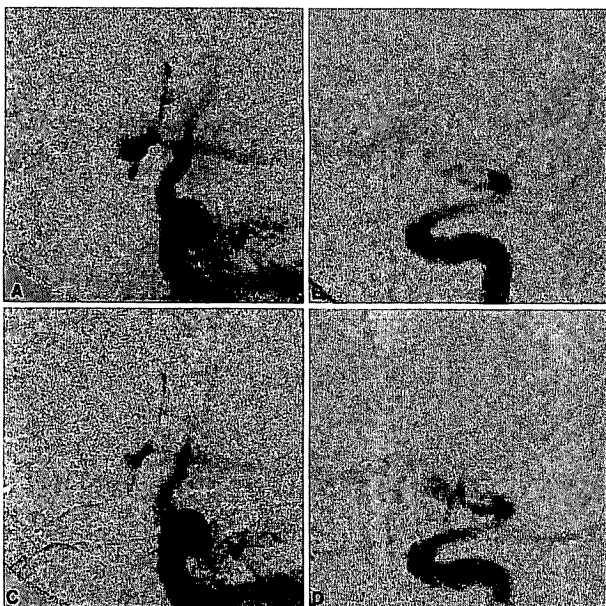


FIG. 1. Anteroposterior (A and C) and lateral (B and D) CA injection angiograms obtained during systole (A and B) and diastole (C and D). The angiograms reveal the pulsatile ACoA aneurysm, in which volume oscillates in conjunction with the phases of the cardiac cycle as a result of increased intracranial pressure. The change in volume is prominently displayed in the anteroposterior views.

A 27-year-old man experienced generalized seizures and consciousness disturbance and was transferred to our institution by ambulance. On arrival, the patient was comatose. Computerized tomography scanning revealed a right frontal intracerebral hematoma with intraventricular and subarachnoid hemorrhage.

The patient underwent emergency cerebral angiography, which revealed slow pulsatile progression of carotid artery (CA) flow and an anterior communicating artery (ACoA) aneurysm that expanded and contracted in conjunction with the cardiac cycle (Fig. 1). The aneurysm volume increased 70% from that measured at systole to that measured at diastole (or, alternatively, a 230% increase in volume from that measured at diastole to that measured at systole). Because of his poor clinical condition, the patient was conservatively managed. He died 4 days later of irreversible brain damage.

The volume of a ruptured aneurysm has been reported to increase by 51% between diastole and systole, compared with an increase of 17.6% in unruptured aneurysms.<sup>1</sup> These data can be interpreted to indicate that volumes of ruptured and unruptured aneurysms are reduced 33.8% and 15%, respectively.

When intracranial or local tissue pressure increases pathologically to reach the level of systemic blood pressure, the volume of an aneurysm may change drastically. Under these circumstances, the aneurysm could be overlooked on angiography because of its collapse or reduced volume.

### Reference

1. Meyer FB, Huston J III, Riederer SS: Pulsatile increases in aneurysm size determined by cine phase-contrast MR angiography. *J Neurosurg* 78:879–883, 1993

Manuscript received June 4, 1999; accepted in final form September 27, 1999.

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