

**Potential Pitfalls of Contrast Enhanced Magnetic Resonance Angiography:
Delayed Visualization of Intracranial Aneurysm with Narrow Neck in Phantom Studies**

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Purpose: As the visualization of aneurysmal sac depends on the bolus arrival and turnover of Gd-DTPA in contrast enhanced magnetic resonance angiography (CE-MRA), the time dynamics for the contrast enhancement of aneurysms was evaluated using flow phantoms with various aneurysmal neck diameters.

Materials and Method: In vitro flow experiments were performed in elastic silicon phantoms of aneurysm with 3 different diameters (2, 5 and 10 mm) of neck mimicking basilar tip aneurysm (diameter of aneurysm sac: 18mm), attached to a cardiac pump that generated physiologically pulsatile flow similar to that of blood. The CE-MRA of phantoms imaged with side injection of 10 ml of 10 times diluted Gd-DTPA using the high speed 3D-FISP (TR/TE=3.2 ms/1.1 ms, 7 seconds per sequence with 4 phases) with a Siemens Vision MR scanner.

Results: Aneurysm with broad neck (5 and 10 mm) were visualized simultaneously with the passage of main bolus of Gd-DTPA. However, aneurysm with narrow neck (2 mm) was visualized after passage of bolus Gd-DTPA. They were contrast visualized on delayed scan.

Conclusion: As visualization of aneurysm with narrow neck can be delayed due to late entry of Gd-DTPA into the aneurysm during CE-MRA, the early phase CE-MRA has the potential missing the intracranial aneurysm with narrow neck.