

Teaching Video NeuroImages: High blood flow velocity in the parent artery prior to basilar tip aneurysm rupture

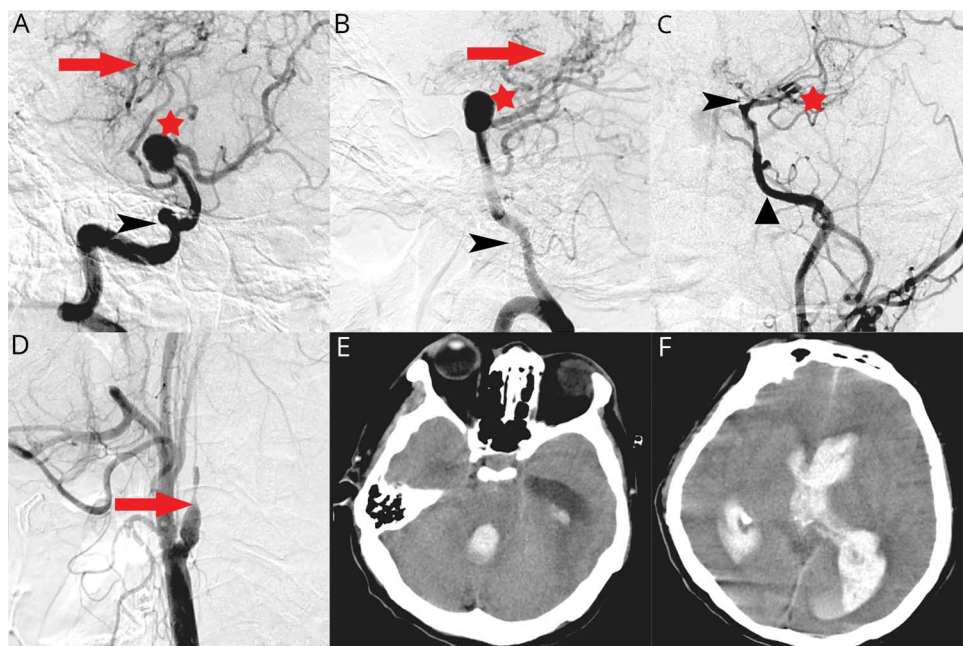
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Figure 1 Coronal and sagittal digital subtraction angiography (DSA) images and axial head CT



Coronal (A) and sagittal (B) DSA images reveal moyamoya vessels (arrows), vertebral artery (arrowheads), and basilar tip aneurysm (stars). Coronal (C) and sagittal (D) DSA images show left internal carotid artery (ICA) (triangle), occlusion of right ICA (arrow), left anterior cerebral artery (arrowhead), and left middle cerebral artery (star). Axial head CT (E, F) demonstrates subarachnoid and ventricular hemorrhage.

A 70-year-old asymptomatic man presented with moyamoya disease (MMD)-associated basilar tip aneurysm (BTA) noted on digital subtraction angiography (figure 1, A–D). 4D-flow MRI revealed a concentrated inflow jet with high velocity compared with previous studies¹ (video 1 and figure 2, A–F). Considering the high risk of endovascular treatment, the patient chose conservative treatment. After 1 month, the aneurysm ruptured (figure 1, E–F).

The compensatory reaction due to internal carotid artery occlusion (figure 1D) could induce increased flow, leading to BTA formation and rupture. 4D-flow MRI can provide

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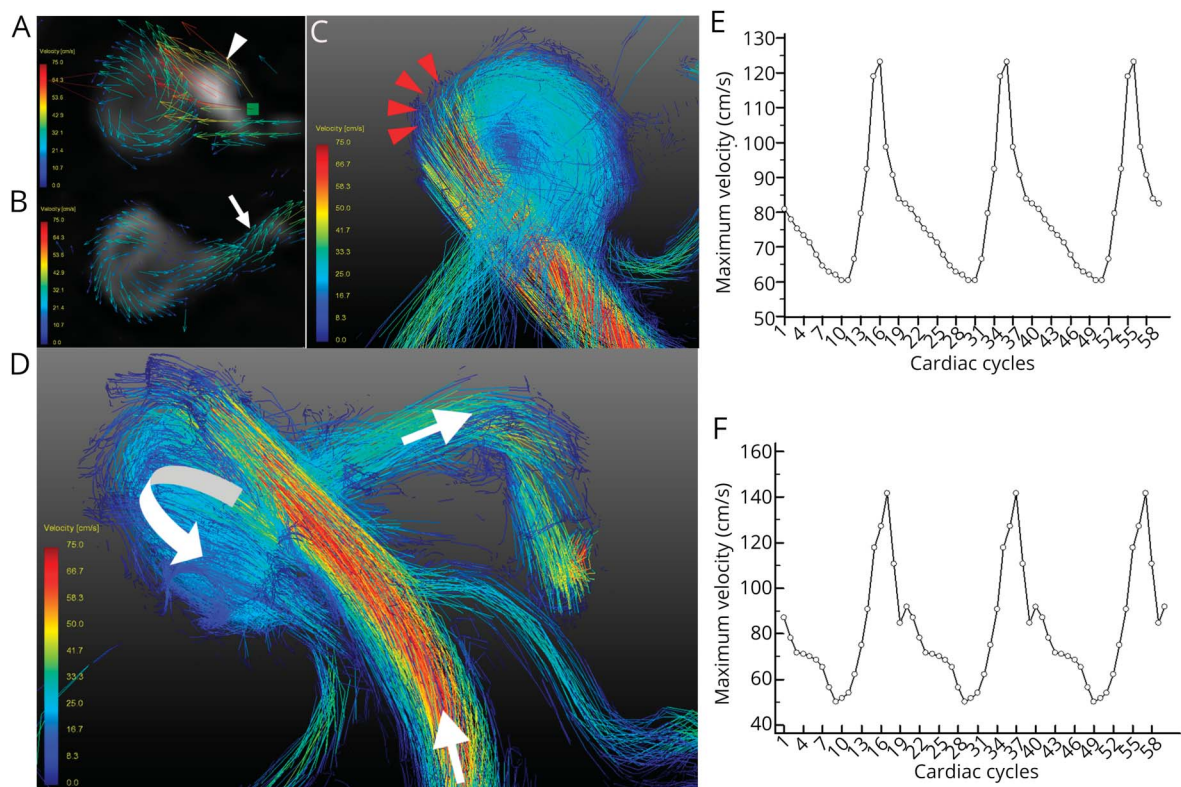
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Figure 2 Velocity vector fields, streamline and velocity diagram throughout cardiac cycles



Velocity vector fields in peak systole (A, B) reveal inflow (arrowhead) and outflow (arrow). Lateral view of streamline (C) shows the narrowed impacted zone (arrowhead). Streamline at peak systole (D) demonstrates blood flow direction (arrow). Velocity diagram (E, F) demonstrates maximum velocity variation throughout cardiac cycles of basilar artery and left posterior cerebral aneurysm, respectively.

comprehensive hemodynamics with accurate blood flow and velocity.² MMD-derived concentrated inflow jet with high velocity can expedite aneurysm rupture, which mandates prompt operation.

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Disclosure

The authors report no disclosures relevant to the manuscript. Go to Neurology.org/N for full disclosures.

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Appendix Authors

Name	Location	Role	Contribution
Fei Peng, MS	Capital Medical University, Beijing	Author	Major role in designing the study, drafted the manuscript for intellectual content
Miaoqi Zhang, BE	Tsinghua University	Author	Major role in the acquisition of data
Xin Feng, MS	Peking Union Medical College	Author	Revised the manuscript for intellectual content
Yunduo Li, BE	Tsinghua University	Author	Analyzed and interpreted the data
Rui Li, PhD	Tsinghua University	Author	Revised the manuscript for intellectual content
Aihua Liu, MD	Capital Medical University	Author	Interpreted the data, revised the manuscript for intellectual content

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