

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

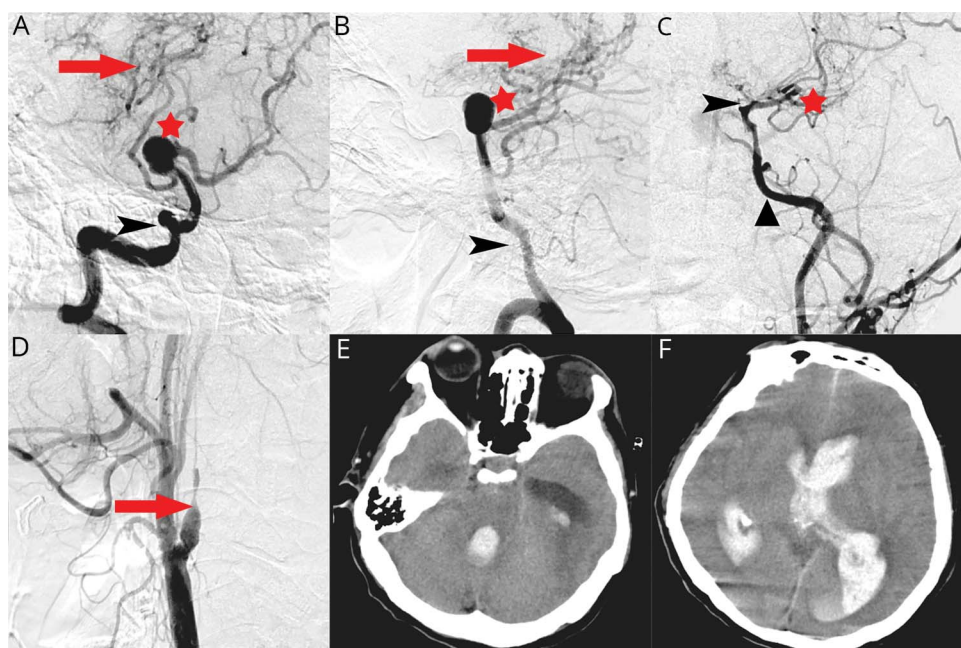
Fei Peng, MS,\* Miaoqi Zhang, BE,\* Xin Feng, MS, Yunduo Li, BE, Rui Li, PhD,‡ and Aihua Liu, MD‡

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## Correspondence

Dr. A. Liu  
liuaihua@doctor@163.com  
or Dr. R. Li  
leerui@tsinghua.edu.cn

**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 studies<sup>1</sup> (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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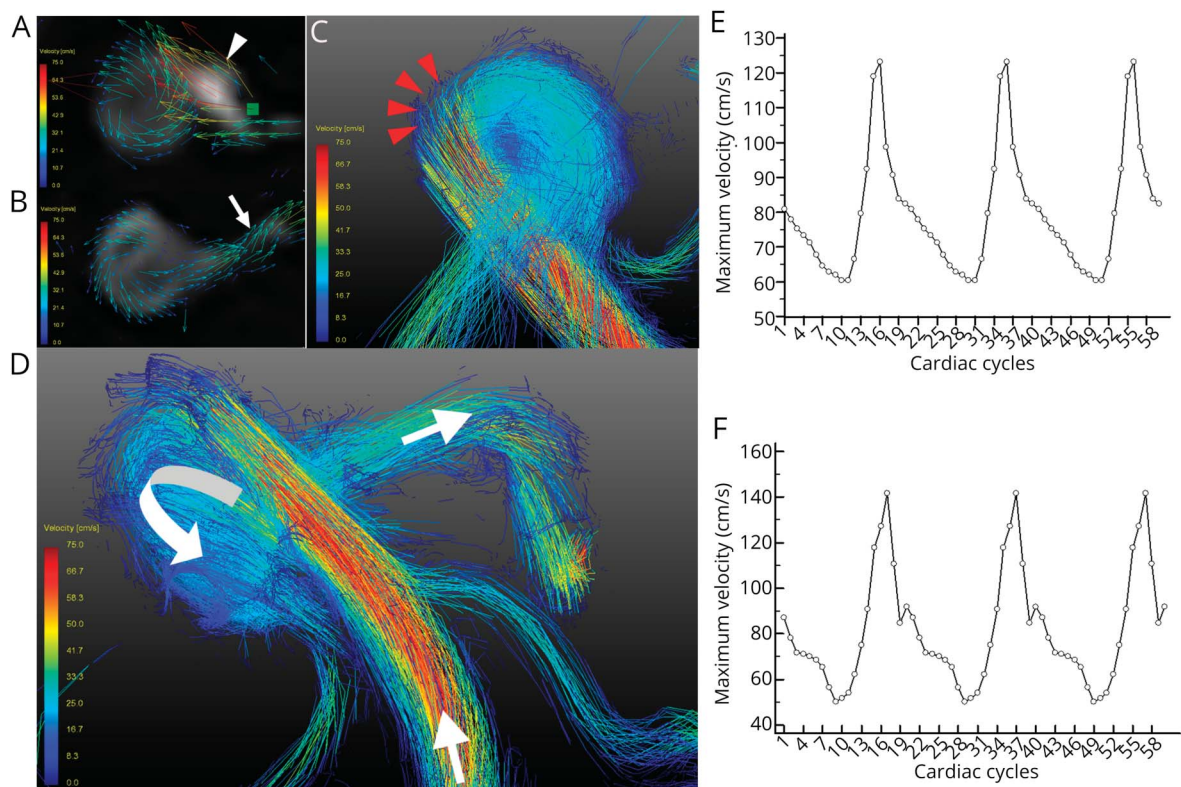
\*These authors contributed equally to this work as co-first authors.

‡These authors contributed equally to this work as co-last authors.

From the Beijing Neurosurgical Institute (F.P., A.L.) and Beijing Tiantan Hospital (F.P., A.L.), Capital Medical University; China National Clinical Research Center for Neurological Diseases (F.P., A.L.), Beijing; Department of Biomedical Engineering (M.Z., Y.L., R.L.), Center for Biomedical Imaging Research, Tsinghua University; and Department of Neurosurgery (X.F.), Beijing Hospital, National Center of Gerontology, Graduate School of Peking Union Medical College, Chinese Academy of Medical Sciences, China.

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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.<sup>2</sup> 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](http://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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