

## Video Abstract

# Microsurgical clipping of a ruptured A1 segment aneurysm

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## Abstract

**Background:** Proximal anterior cerebral artery aneurysms are usually rare small aneurysms, mostly arising at the origin of perforating arteries on the A1 segment. They account for <1% of all intracranial aneurysms and may be treated by microsurgical or endovascular procedures. The microsurgical approach requires careful evaluation of the imaging. The 3D configuration and orientation of the aneurysm related with the anatomical landmarks (optic chiasm and the adjacent structures of the skull base) might be useful for the navigation. The dominance, length, deep, and course of the ipsilateral A1 are also important features for planning the temporary and definitive clipping. The presence of vascular abnormalities and space-occupying hematoma should be also evaluated. Intraoperatively, the identification of the medial lenticulostriate branches and the recurrent artery of Heubner, which can originate from the distal A1 in around 10% of cases, might be essential aiming to carry a safe procedure.

**Technique:** The patient was placed in supine position. The head, positioned above the cardiac level, was slightly rotated (20°–30°) and tilted to the opposite side with minimal extension. A right lateral supraorbital approach followed by a frontal ventricular drainage was applied to reduce intracranial pressure before dura opening. Intradurally, the carotid cistern was opened to release some extra cerebrospinal fluid (CSF) and to expose the internal carotid artery bifurcation and the A1 segment. Once, some surrounding adhesences and clots indicated the probable location of the aneurysm, a temporary clip was applied on the proximal A1 segment to facilitate the dissection of the aneurysm base, the A1 artery, and the evolved perforators. A ruptured aneurysm arising at the origin of an aberrant fronto-orbital artery was discovered. Initial pilot clip was applied in the aneurysm base and the temporary clip was released. With a controlled aneurysm and after a careful vascular dissection, a definitive clip was placed under temporary trapping. After careful evaluation of some residual neck, a second definitive clip was applied under the first one by a double-clip technique. Intraoperative angiography determined complete occlusion of the aneurysm. The orbitofrontal branch was occluded as well, and small pieces of surgical embedded in papaverine were

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applied over its surface. Finally, after opening the lamina terminalis, an external third ventriculostomy was placed for additional CSF removal, replacing the frontal external ventriculostomy.

**Conclusion:** Skillful microneurosurgery is required for the management of challenging small ruptured A1 segment aneurysms.

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**Key Words:** A1 aneurysm, clipping, double-clip, microneurosurgery, small aneurysm

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