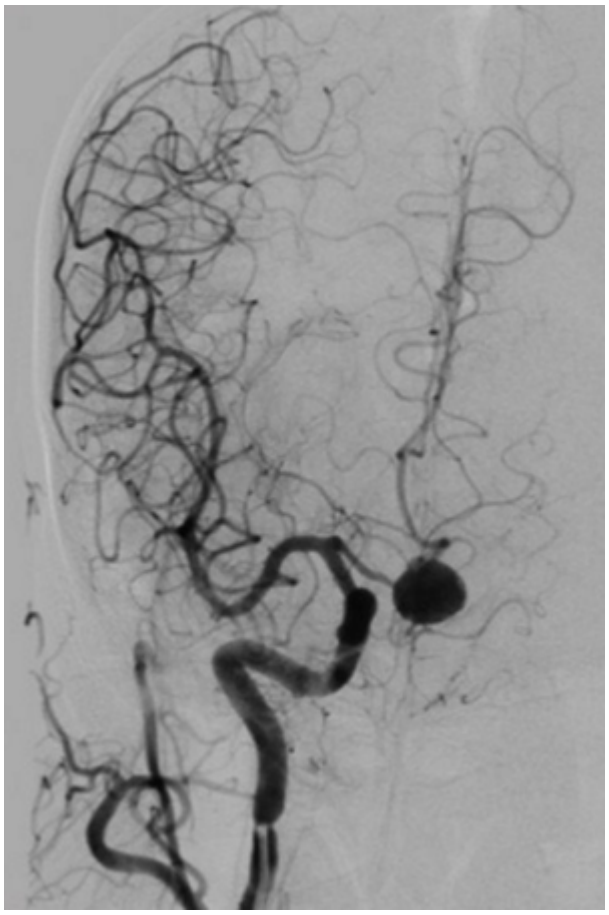
Anterior communicating artery aneurysm orientation

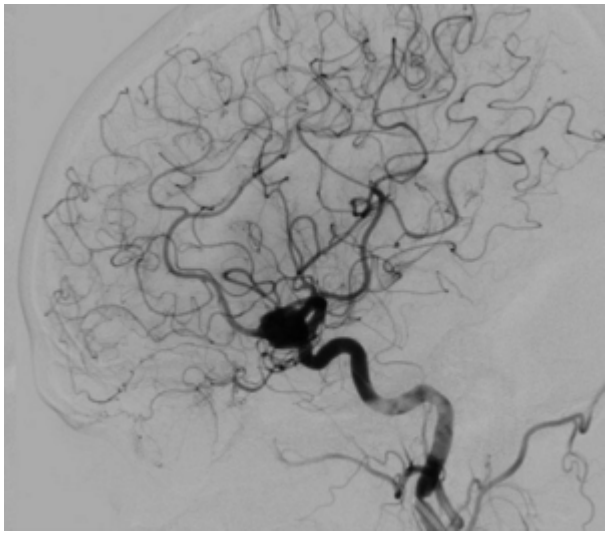
- Coincident intracranial aneurysm on the target vessel of acute ischemic stroke treated with mechanical thrombectomy: a multicentric case-control study
- Complex Anatomy, Advanced Techniques: Microsurgical Clipping of a Ruptured Hypophyseal Artery Aneurysm
- A study on the therapeutic effect of precise clipping of intracranial aneurysms assisted by CTA and 3D-slicer software
- Potential for reduction of radiation dose in the assessment of the lead orientation in directional deep brain stimulation electrodes
- Polyarteritis nodosa with life-threatening intracranial aneurysms in a child, and treatment with infliximab
- Aneurysm clipping on WEB device: A feasibility study using a human ex-vivo aneurysm model
- Discriminators of Paraclinoid Aneurysm Rupture Based On Morphological Computer-Assisted Semiautomated Measurement (CASAM) and Hemodynamic Analysis
- Avoiding missed opportunities in AI for radiology

Various surgical and anatomical classifications have been proposed to date related to Anterior communicating artery aneurysm projection. Nonetheless, a universally accepted classification system is yet to be established. A study aimed at establishing a standardized classification system for ACoA aneurysms with utilization 3D technology and defining reference lines for their projections. The goal is to create a simple, understandable, surgically beneficial, and reliable classification system based on neurovascular structures in the region, including safe and hazardous zones. The radiologic data of 96 patients with ACoA aneurysm who were treated between 2012 and 2020 were retrospectively analyzed, and a planned classification scale was developed with the data obtained. The classification aimed to create 9 main projection groups in the sagittal plane: superior, inferior, anterior, and posterior in linear orientation, and anterosuperior, posterosuperior, anteroinferior, posteroinferior, and complex in quadrant orientation. The coronal and axial planes included medial, lateral, and midline classifications, resulting in a 3-dimensional classification system with 25 projections. Among the 96 patients, 32 had linear and 64 had quadrant projections. In the sagittal plane, the linear projection breakdown was as follows: superior (28%), inferior (6.25%), anterior (53%), and posterior (12.5%). For the quadrant projection, the distribution was as follows: anterosuperior (53%), posterosuperior (12.5%), anteroinferior (21.87%), posteroinferior (3.12%), and complex (9.37%). Overall, 35.4% aneurysms were anterosuperior, 17.7% anterior, 14.58% anteroinferior, 9.37% superior, 8.3% posterosuperior, 6.25% complex, 4.16% posterior, 2.08% posteroinferior, and 2.08% inferior projection. The study proposes a projection classification that utilizes 3D technology for safe surgery based on neurovascular structures in the region and thus better reveals safe and hazardous zones, including three plans, three dimensions, and two orientations. The use of this classification system offers valuable guidance for daily practice in the treatment of ACoA aneurysms [1)].

Inferior or downward direction



Posterior or backward direction



Antero superior direction

In anterosuperior-projecting anterior communicating artery aneurysms, the aneurysm dome usually adheres to one or both proximal A2 segment, which may present technical difficulties. A video demonstrates microsurgical clipping of a ruptured anterosuperior-projecting AComA aneurysm. A 52-year-old male presented with a Hunt and Hess grade II subarachnoid hemorrhage (SAH). Computed

tomography showed SAH in the basal cisterns, sylvian and interhemispheric fissures. Angiography demonstrated a wide-necked AComA aneurysm projecting anterosuperiorly. Considering the risk of recurrence, the patient decided to accept surgical treatment. The patient was positioned supine and the aneurysm was exposed via the lateral supraorbital approach. The carotid cistern and the optic cistern was opened to release cerebrospinal fluid (CSF) and achieve adequate brain relaxation. A subpial resection of a small portion of the gyrus rectus was performed to visualize the ipsilateral A2, the recurrent artery of Heubner and the base of the aneurysm. A plane was dissected between the anterior aspect of both A2 segment and the posterior aspect of the aneurysm. A straight clip was placed to parallel to the ACoA to completely obliterate the aneurysm. Postoperative angiography confirmed complete obliteration of the aneurysm. The patient recovered well without any complications. Successful treatment requires preoperative surgical planning, precise dissection, and preservation of critical structures. With adherence to these general principles, these aneurysms can be treated safely and effectively [2].

1)
Orakdogen M, Mammadkhanli O, Chousein B, Simsek O. Development of a comprehensive and clinically applicable novel projection classification system for anterior communicating artery aneurysms. Neurosurg Rev. 2024 Jan 10;47(1):39. doi: 10.1007/s10143-023-02275-y. PMID: 38200376.
2)
Xu F, Bambakidis NC. Microsurgical clipping of ruptured anterosuperior-projecting anterior communicating artery aneurysms: how I do it. World Neurosurg. 2018 May 17. pii: S1878-8750(18)31023-4. doi: 10.1016/j.wneu.2018.05.070. [Epub ahead of print] PubMed PMID: 29778597.