Anterior circulation intracranial aneurysm

- Histological Analysis of Intracranial Cerebral Arteries for Elastin Thickness, Wall Thickness, and Vessel Diameters: An Atlas for Computational Modeling and a Proposed Predictive Multivariable Model of Elastin Thickness
- Intracranial Aneurysm Predisposing to Terson's Syndrome: Insights From a Systematic Review
- Flow diversion for acutely ruptured intracranial aneurysms: A single-center retrospective analysis of 30 consecutive cases
- The Lattice flow diverter for the treatment of intracranial aneurysms: a single center experience in 117 consecutive aneurysms
- Cerebral aneurysm surgical training in the neuroendovascular era and its impact on the production of comfortable aneurysm surgeons
- Inconsistency of AI in intracranial aneurysm detection with varying dose and image reconstruction
- Cranial-orbital approaches for vascular pathology: A review of surgical approach selection and technical considerations
- Technical Success and Clinical Outcomes of the Low-Profile Visualized Intraluminal Support EVO (LVIS EVO) Stent in the Treatment of Intracranial Aneurysms: A Systematic Review and Meta-Analysis

Intracranial aneurysm of the anterior circulation.

Classification

Internal carotid artery aneurysm.

Posterior communicating artery aneurysm.

Middle cerebral artery aneurysm.

Anterior communicating artery aneurysm.

Ophthalmic artery aneurysm.

Pericallosal artery aneurysm.

Anterior cerebral artery aneurysm

Middle cerebral artery aneurysm

Epidemiology

Approximately 90% of intracranial aneurysm arise from the anterior circulation.

Anterior cerebral artery aneurysm (ACA) / Anterior communicating artery aneurysm (ACoA complex): ~30-40%

Supraclinioid internal carotid artery aneurysm ICA and ICA / posterior communicating artery aneurysm

(PCoA junction): ~30%

Middle cerebral artery aneurysm (MCA) (M1/M2 junction) bi/trifurcation: ~ 20-30%.

Small anterior circulation intracranial aneurysm

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Large

Aneurysms of the anterior circulation larger than 2cm have a complex relationship to the anterior skull base, requiring a multi-modality management approach.

In a retrospective study of 54 patients with such aneurysms who underwent clipping between 2001 and 2012 analyzes clinical and surgical data, aneurysm characteristics and correlates them with respect to the Glasgow outcome score at follow-up and immediate post-operative clinical status.

Patients with an outcome score of 5 or 4 were categorized as “good”, while those with score 3-1 were “poor”. Fisher's exact test and paired T-test ($p<0.5$) were used to test statistical significance for discrete and continuous variables respectively.

44 (81.4%) patients had a good outcome. Patients with non-ophthalmic/paraclinoid aneurysms had significantly lower incidence of adverse intra-operative events ($p=0.035$). Patients older than 50 years ($p=0.045$), with adverse intra-operative events ($p=0.015$) and post-operative infarction ($p<0.001$) had a poor outcome compared to those younger than 50 years age and those without adverse intra-operative events or infarctions. The grouped age variable had maximum influence on patient outcome. Location and size of aneurysm did not have an overall impact on surgical outcome. There were 4 mortalities.

Primary clipping of proximal non-cavernous aneurysms on the internal carotid artery is associated with adverse intra-operative events. A multi-modality treatment approach in these aneurysms should be individualized, more so in patients older than 50 years [1)].

Bilateral

Patients with bilateral anterior circulation aneurysms present a management challenge. These lesions may be treated in a staged manner or alternatively, for select patients, a contralateral approach may be utilized to treat bilateral aneurysms with a single surgery.

Treatment

According to contemporary data about occlusion rates, functional outcomes, and complications, primary or secondary treatment of LGIAs of the anterior circulation seems justified. Microsurgical occlusion rates are higher in LGIAs. An expert consensus on reporting complications and management

strategies is warranted [2)]

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see Endoscope assisted surgery for anterior circulation aneurysm

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Pipeline embolization device (PED) can be utilized in the treatment of distal anterior circulation aneurysms with difficult anatomy for conventional surgical or endovascular techniques. Larger-scale studies with long-term follow-up are needed to further elucidate the durability of PED treatment and its effect on perforator-rich vascular segments [3)].

Case series

Anterior circulation aneurysm case series.

Case report

A 57-year-old woman with incidentally discovered bilateral aneurysms (left middle cerebral artery [MCA], left anterior choroidal artery and right MCA). A contralateral approach through a left pterional craniotomy was performed for microsurgical clipping of all three aneurysms. The techniques of pterional craniotomy, contralateral approach, microsurgical clipping and intraoperative angiography are reviewed. The authors are grateful to Wuyang Yang, M.D. for his assistance. The video can be found here: http://youtu.be/MlPIu3hQZkg [4)].

1)
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2)
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3)
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4)
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