Middle cerebral artery bifurcation aneurysm classification

- Endovascular Treatment of Wide-Neck Intracranial Aneurysms Using the Novel Contour Neurovascular System: 5-Year Follow-Up
- Microsurgical management of previously embolized intracranial aneurysms: A single center experience and literature review
- Drill turn technique for enhanced visualization of wide-neck bifurcation aneurysms in Y-stent-assisted coiling with LVIS EVO stents: technical considerations and mid-term results
- Y Stent-Assisted Coiling Technique for Bifurcation Aneurysms Using Double Neuroform Stent: a Large Restrospective Series
- Unreported branching pattern of the triplicated anterior cerebral artery associated with multiple bilateral variants of the superior cerebellar artery detected by computed tomography angiography and 3D modeling
- Cerebral Arterial Bifurcations Harboring D Type Aneurysm are more Asymmetrical than those with C Type Aneurysm
- The outcomes of recurrent wide-necked intracranial aneurysms treated with the Woven EndoBridge (WEB): A retrospective bicenter study
- Woven EndoBridge device for ruptured aneurysms: perioperative results of a US multicenter experience

In the series of Elsharkawy et al. the main middle cerebral artery bifurcation was the most common location for Middle cerebral artery aneurysm, harboring 829 aneurysms (63%). The 406 Middle cerebral artery M1 segment aneurysms comprised 242 M1 early cortical branch aneurysms (60%) and 164 M1 lenticulostriate artery aneurysms (40%). We found 106 MCA aneurysms (8%) at the origin of large early frontal branches simulating M2 trunks liable to be misclassified as MCA bifurcation aneurysms. Even though 51% of the 407 ruptured MCA aneurysms were associated with an intracerebral hematoma, this did not affect the classification.

Studying MCA angioarchitecture and applying the 4-group classification of MCA aneurysms is practical and facilitates the accurate classification of MCA aneurysms, helping to improve surgical outcome. [1)].

From the analysis of 61 MCA bifurcation aneurysms, 4 shape pattern categories were created that allowed the classification of 56 aneurysms (91.8%). The number of aneurysms allotted to each shape cluster was 10 (16.4%) in category 1, 24 (39.3%) in category 2, 7 (11.5%) in category 3, and 15 (24.6%) in category 4.

Through the use of anatomic visual cues, MCA bifurcation aneurysms can be grouped into a small number of shape patterns with an associated clip solution. Implementing these principles within current neurosurgery training paradigms can provide a tool that allows more efficient transition from novice to cerebrovascular expert [2)].

While most aneurysms that originate at the middle cerebral artery (MCA) bifurcation or trifurcation have a saccular geometry, some MCA aneurysms may exhibit a fusiform morphology and incorporate not only the proximal MCA trunk but also major MCA branches. In contrast to saccular aneurysms, fusiform aneurysms represent a distinct subset of intracranial aneurysms with unique underlying pathological features, hemodynamic forces, anatomical distribution, as well as natural history that

governs their treatment. [3].

1)

Elsharkawy A, Lehečka M, Niemelä M, Billon-Grand R, Lehto H, Kivisaari R, Hernesniemi J. A new, more accurate classification of middle cerebral artery aneurysms: computed tomography angiographic study of 1,009 consecutive cases with 1,309 middle cerebral artery aneurysms. Neurosurgery. 2013 Jul;73(1):94-102; discussion 102. doi: 10.1227/01.neu.0000429842.61213.d5. PubMed PMID: 23615110.

2)

Washington CW, Ju T, Zipfel GJ, Dacey RG Jr. Middle cerebral artery bifurcation aneurysms: an anatomic classification scheme for planning optimal surgical strategies. Neurosurgery. 2014 Mar;10 Suppl 1:145-53; discussion 153-5. doi: 10.1227/NEU.0000000000000250. PubMed PMID: 24226424.

3)

Pabaney AH, Mazaris PA, Kole MK, Reinard KA. Endovascular management of fusiform aneurysm of anterior temporal artery: Technical report. Surg Neurol Int. 2015 Jul 20;6:119. doi: 10.4103/2152-7806.161239. eCollection 2015. PubMed PMID: 26290771; PubMed Central PMCID: PMC4521225.