

# Mini Pterional Craniotomy for Unruptured Aneurysm Clipping

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#### Introduction

The pterional craniotomy (PC) is one of the most commonly employed surgical approaches in neurosurgery. The traditional PT has some disadvantages, however, including complete disruption of the temporalis muscle, temporal wasting, cosmetic deformity, and possible injury to the frontal branch of the facial nerve. Alternative techniques have been introduced in an attempt to minimize the tissue trauma while maintaining adequate surgical exposure.[1] Of these approaches, the mini-pterional craniotomy (MPC) is used for approaches that require splitting the Sylvian fissure. Moreover, the MPC has been shown to improve cosmetic results postoperatively, with higher patient-reported satisfaction rates.[2]

#### Methods

All patients who underwent unruptured aneurysm clipping via the MPC at Vanderbilt University Medical Center from May 2013 to October 2014 and at Mount Sinai Medical Center from April 2016 to March 2017 were included in this abstract (the timeframe will be expanded to a 3-year period for the final study). Demographic, intraoperative, postoperative, and radiographic information were retrospectively collected from the medical record.

## Results

A total of 44 patients with 51 aneurysms were included for analysis (Table 1). The average age was 54.8 years and 28 (63.6%) of patients were female. Aneurysm locations included 3 (5.9%) ICA-PCOM, 3 (5.9%) ICA terminus, 13 (25.5%) ACOM, 2 (3.9%) A1, 1 (2.0%) M1, 27 (52.9%) MCA bifurcation, and 2 (3.9%) M2. A wide aneurysm neck, as defined as > 4 mm or aspect ratio < 2.0, was present in 39 cases (76.5%). There were two intraoperative complications, including aneurysm rupture and injury to the recurrent artery of Heubner (RAH). There were three postoperative complications including two seizures and one infarct (secondary to the RAH injury). At the time of writing this abstract, postoperative angiography was performed for 45 aneurysms (88.2%) and, of these, there was adequate aneurysm occlusion (either complete occlusion or neck remnant) in 97.8% of cases.

Table 1	
Variable	N (% or SD)
Age	54.8 (11.3)
Female Gender	28 (63.6)
Location	
ACOM	13 (25.5)
A1	2 (3.9)
M1	1 (1.0)
MCA bifurcation	27 (52.9)
M2	2 (8.3)
ICA- PCOM	3 (5.9)
ICA terminus	3 (5.9)
Aspect Ratio	
<2.0	39 (76.5)
Postoperative Angiography	45 (88.2)

## Conclusions

Our small series demonstrates that the MPC can be used primarily for aneurysms of the distal ICA, proximal ACA/ACOM, and the entire MCA up to M2 with excellent angiographic results. In our experience, limitations include paraclinoid aneurysms, those distal to M2 and complex ACOM aneurysms that need multiple points of view.

## **Learning Objectives**

By the conclusion of this session, participants should be able to detail the applicability of the mini pterional craniotomy for unruptured aneurysm clipping.

### References

1.Wong, J. H. Y., Tymianski, R., Radovanovic, I. & Tymianski, M. Minimally Invasive Microsurgery for Cerebral Aneurysms. Stroke 46, 2699–2706 (2015).

2.Welling, L. C. et al. Prospective randomized study comparing clinical, functional, and aesthetic results of minipterional and classic pterional craniotomies. J. Neurosurg. 122, 1012–1019 (2015).

3.Caplan, J. M. et al. The Minipterional Craniotomy for Anterior Circulation Aneurysms. Neurosurgery 10, 200–207 (2014).

4. Figueiredo, E. G. et al. Surgical experience of minipterional craniotomy with 102 ruptured and unruptured anterior circulation aneurysms. J. Clin. Neurosci. 27, 34–39 (2016).

5. Figueiredo, E. G., Paulo, S., Nakaji, P., Crawford, N. & D, P. The Minipterional Craniotomy: Technical Description and Anatomic Assessment. Neurosurgery 61, 256–265 (2007).