ISSN 1220-8841 (Print)
ISSN 2344-4959 (Online)

ROMANIAN
NEUROSURGERY

Vol. XXXVI | No. 4 December 2022

# Mobilization of the temporal pole as integrated step in microsurgical clipping of pure posteriorly directed posterior communicating artery aneurysm

Mustafa Ismail,
Salima B. Alsaadi,
Muslim Mousa Badr,
Mohammed Al-Dhahir,
Aanab O. Abdulameer,
Alkawthar M. Abdulsada,
Aktham O. Al-Khafaji,
Samer S. Hoz

DOI: 10.33962/roneuro-2022-086

Romanian Neurosurgery (2022) XXXVI (4): pp. 476-478
DOI: 10.33962/roneuro-2022-086
www.journals.lapub.co.uk/index.php/roneurosurgery

# Mobilization of the temporal pole as integrated step in microsurgical clipping of pure posteriorly directed posterior communicating artery aneurysm

**Mustafa Ismail[1], Salima B. Alsaadi[2],Muslim Mousa Badr[2], Mohammed Al-Dhahir[3], Aanab O. Abdulameer[1], Alkawthar M. Abdulsada[4], Aktham O. Al-Khafaji[1], Samer S. Hoz[5]**

[1] Department of Neurosurgery, College of Medicine, University of Baghdad, Baghdad, IRAQ
[2] Department of Neuroradiology, Neurosurgery Teaching Hospital, Baghdad, IRAQ
[3] Department of Neuroscience, University of Florida, USA
[4] Azerbaijan Medical University. Baku, AZERBAIJAN
[5] Department of Neurosurgery, University of Cincinnati, Cincinnati, OH, USA

Keywords
internal carotid artery, posterior communicating artery aneurysm, temporal lobe

Corresponding author:
**Samer S. Hoz**

Department of Neurosurgery, University of Cincinnati College of Medicine, Cincinnati, OH, USA

hozsamer2055@gmail.com

## ABSTRACT

A pure posteriorly posterior communicating artery (PCoA) aneurysm represents a surgical challenge. This is mainly when there is a need for good exposure of the aneurysmal neck, sac, PCoA, and anterior choroidal arteries. Ruptured pure posteriorly directed PCoA aneurysm imposes significantly extra challenge as the surgeon undergoes dissection through a tight brain. Even with measures commonly used to attain brain relaxation like the lumbar drain and cisternal fenestration.

Here, we describe a technique for posterior temporal pole mobilization (TPM) as an integrated part of microsurgical clipping of ruptured pure posteriorly directed PCoA aneurysms. This technique is implicated in twenty-three successive cases of ruptured PCoA aneurysms in the neurosurgery teaching hospital in Baghdad, Iraq, with no reported complications.

## PERTINENT ANATOMY

The temporal pole is usually connected by bridging veins with the spheno-parietal sinus anteriorly and the cavernous sinus medially. These bridging veins are also known as the pre-uncal veins. These veins are neither described in the literature as a critical contributor to any of the essential surrounding veins (basal vein of Rosenthal and deep middle cerebral vein) nor described as a vital drainage pathway for the temporal parenchyma [3].

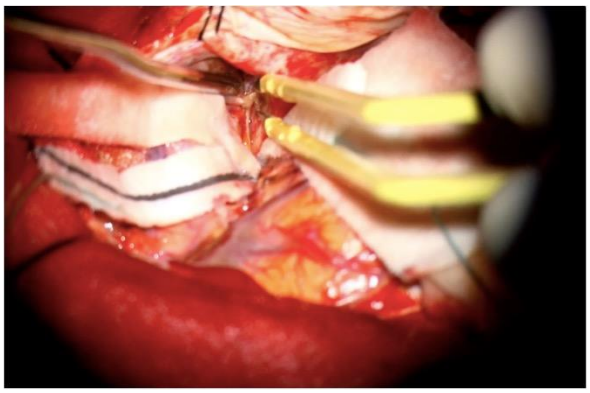


ISSN online 2344-4959
© Romanian Society of Neurosurgery

First published
December 2022 by
London Academic Publishing
www.lapub.co.uk

## Technique

Following the steps of the pterional approach, which include,1) opening of the carotid cistern,2) dissection of the proximal Sylvian fissure then,3) identifying the pre-uncal veins, and,4) cutting the bridging veins between the spheno-parietal and the cavernous sinuses (pre-uncal veins) then,5) releasing of the temporal pole followed by,6) widening of the surgical corridor (at least 2 cm of free space posterior to the sphenoid ridge) [3,4]. To illustrate this technique, two cases of PCoA aneurysms approaches were described in the images below (Figure 1 and Figure 2).



A.

B.

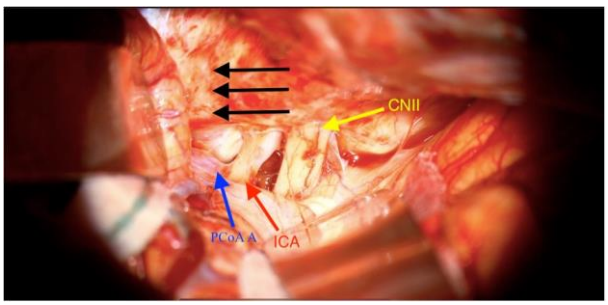



**Figure 1.** Intraoperative images of case 1, through the left pterional approach (**A**) shows cutting and releasing by cauterization of the anterior temporal veins before temporal pole mobilization. (**B**) is showing the superficial retraction of the temporal lobe with TPM and now we can more appreciate the space lateral to the supracliniold Internal carotid artery which widens the surgical field for safe and easy microsurgical clipping of the PCoA aneurysm. CNII: optic nerve, PCoA A: Posterior communicating artery aneurysm, ICA: Internal Carotid Artery.

## Advantage

The requirement for temporal lobe traction is minimized or even absent (the retractor will hold the released temporal pole), which leads to easy identification of the PCoA aneurysm, wide exposure to the retro-carotid space, and may provide more dissection and clipping angles. The mobilization will render the temporal pole free as it does not disturb the medial (mesial) temporal cortex that usually adheres to the aneurysm. It is technically an easy and time-preserving technique.

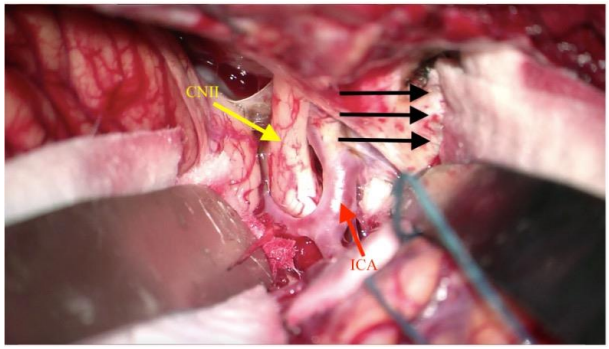



**Figure 2.** Intraoperative view of case 2, through right pterional approach, showing more appreciated and widen surgical space lateral to supra clinoid ICA after TPM was performed (Balck arrows). CNII: optic nerve, ICA: Internal Carotid Artery.

## Limitations

Generally, the temporal lobe mobilization (usually it used to be retracted) should not be encouraged for all ruptured PCoA aneurysm cases. However, TPM has a peculiar advantage in pure posteriorly directed PCoA aneurysm cases. Here, we describe mobilization of the temporal pole only, and no distribution of the mesial temporal cortex is required. Also, the TPM technique includes the sacrifice of the bridging veins connecting the temporal tip. Thus, there is at least a theoretical risk of venous congestion and subsequent infarction [1]. Here, our technique depends on the size of the bridging veins and knowing the pattern of drainage, including a physiological principle that governs the venous drainage in the brain. If the vein is small, its counterpart or alternative pathway will be large and dominate venous drainage. This will lessen the possibility of the development of consequences. When the scarification of the temporal veins is not possible, which may be due to the larger in size, it's critical to dissect enough of the superficial Sylvian vein from the temporal lobe, especially around the temporal tip, to retain temporal veins [2,3]. Our patients had not developed such complications, and

the literature showed no report of venous complications after sacrificing the temporal veins. However, a larger series is required before approving this additive surgical step.

## References

1. Andrews RJ, Bringas JR. A review of brain retraction and recommendations for minimizing intraoperative brain injury. Neurosurgery 1993;33:1052-64.
2. Heros RC, Lee SH. The combined pterional/anterior temporal approach for aneurysms of the upper basilar complex: Technical report. Neurosurgery 1993.
3. Katsuno M, Tanikawa R, Izumi N, Hashimoto M. A modified anterior temporal approach for low-position aneurysms of the upper basilar complex. Surg Neurol Int 2015;6:10.
4. Post N, Russell SM, Jafar JJ. Role of uncal resection in optimizing transsylvian access to the basilar apex: cadaveric investigation and preliminary clinical experience in eight patients. Operative Neurosurgery. 2005 Apr 1;56(suppl_4):ONS-274.