

Letter to the Editor

Unilateral subfrontal approach to anterior communicating artery aneurysms: A review of 28 patients

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Dear Editor,

The authors present the named “unilateral subfrontal approach” for anterior communicating aneurysms, analyzed in a small clinical series. The authors present this approach mainly as an alternative to the pterional approach. This approach was previously described as the “superciliary keyhole approach” or the “lateral supraorbital approach” for the treatment not only of vascular disease but also for tumors.^[2] The authors present their approach as a “tailored” pterional approach. Nevertheless, there are some aspects that are subject of criticism as the routine use of external ventriculostomy or lumbar drainage; these are procedures that carry additional risks: Intraoperative rebleeding, frontal lobe lesion among others. We strongly recommend the microsurgical wide opening of the basal cisterns and the fenestration of the lamina terminalis to obtain CSF drainage and brain relaxation during the surgery, we do not see the sylvian fissure opening as an additional source of complications as the authors pointed out. Additionally, these microsurgical simple procedures are implicated in the prevention of the hydrocephalus and vasospasm in the subarachnoid hemorrhage secondary to ruptured aneurysms.^[1] The four advantages that the authors provided are at least uncertain. In the number 4 we can say that the pterional approach provides a corridor to see up to the contralateral middle cerebral artery bifurcation. Another important issue is that they have a 50% of resection of the gyrus rectus in unruptured and 61% in ruptured aneurysms, so the approach does not avoid this designed resection of the frontal lobe; we only use a small gyrus rectus resection in the anterior communicating artery (ACoA) aneurysms superiorly projected located between the two A2 segments, especially in the large or giant lesions, in all the other

cases we split the interhemispheric cistern, which is possible using the pterional approach. The authors point out that the pterional approach leaves a cosmetic defect at the level of the pterion, but in their own series they leave two burr holes in the frontal bone visible in the forehead.

Salma *et al.*^[3] recently published a cadaveric anatomical study comparing these two approaches, in their paper they analyze the qualitative and quantitative anatomic evaluation between these two approaches, showing that this kind of approach can eventually reduce the temporalis muscle trauma, and offers an equivalent access and exposure of the anterior communicating artery complex, optic nerve, optic chiasm, and sellar areas. However, like all the anatomical cadaveric models, they do not consider the role of the cisternal and ventricular opening using these anatomical corridors as the natural pathways to reach the pathology, in this case ACoA aneurysms.

We think that in patient's ruptured aneurysms with hematoma or subarachnoid hemorrhage (SAH) of high Fisher grade this approach is not a good choice, because it does not allow a wide opening of the sylvian fissure for cleansing the blood clots and relaxing the brain. Hence, this approach would be useful just for treating the aneurysm, but not to deal with the SAH,

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without reducing neither the risk of vasospasm nor the hydrocephalus.

REFERENCES

1. Mura J, Rojas-Zalazar D, Ruiz A, Vintimilla LC, Marengo J. Improved outcome in high-grade aneurysmal subarachnoid hemorrhage by enhancement of endogenous clearance of cisternal blood clots: A prospective study that demonstrates the role

Commentary

We thank Drs. Mura, Torche, and Oliveira for their thoughtful comments on our paper. We agree that sylvian fissure dissection can be helpful by releasing the frontal lobe for elevation (as most pterional approaches to anterior communicating artery aneurysms frequently “morph into a subfrontal approach” in the end)^[5] and by providing cerebrospinal fluid (CSF) relaxation. However, these maneuvers come with the risk of brain manipulation and injury during the sylvian dissection, particularly in a patient with a ruptured aneurysm and ill-defined arachnoid planes. The decision on surgical approach is best made by the surgeon based on their experience, while weighing the relative risks of either approach.

We agree that any craniotomy can leave a cosmetic defect, but would submit that a small burrhole over the frontal lobe is easily covered and is likely to achieve a satisfactory cosmetic result. Stripping the temporalis muscle and performing a traditional fronto-temporal pterional craniotomy can result in muscle wasting that, especially in female patients, is disfiguring and distressful to the patient.

We agree with Drs. Mura, Torche, and Oliveira that fenestration of the lamina terminalis helps decrease hydrocephalus, and our approach provides excellent visualization of the lamina terminalis, as highlighted in Figure 5 of our paper. The subfrontal approach is not inferior to a more routine trans-sylvian/pterional approach in patients with SAH/hematoma because of a presumed increase in incidence of vasospasm or hydrocephalus due to inability to remove clots and/or open cisterns. With respect to vasospasm, literature examining the efficacy of subarachnoid clot removal on development of subsequent cerebral vasospasm following aneurysm rupture is mixed, with many authors finding no effect of clot removal on vasospasm.^[2,3] Others have reported decreased spasm only in the interhemispheric cisterns and A2 segments but not the sylvian fissure, insular cisterns, or M1/M2

of lamina terminalis fenestration combined with modern microsurgical cisternal blood evacuation. *Minim Invasive Neurosurg* 2007;50:355-62.

2. Romani R, Laakso A, Kangasniemi M, Lehecka M, Hernesniemi J. Lateral supraorbital approach applied to anterior clinoidal meningiomas: Experience with 73 consecutive patients. *Neurosurgery* 2011;68:1632-47.
3. Salma A, Alkandari A, Sammet S, Ammirati M. Lateral supraorbital approach vs pterional approach: An anatomic qualitative and quantitative evaluation. *Neurosurgery* 2011;68:364-72.

segments that are normally accessed via the trans-sylvian approach.^[1] This debate is unsolvable until the true causes of vasospasm are better elucidated.^[4,6,7]

The subfrontal approach minimizes sylvian dissection, brain manipulation and exposure of an additional vascular territory (MCA), and we believe that increased surgical manipulation required for clot removal is of uncertain utility in the prevention of vasospasm. These are our reasons for providing a review of our series, but the experiences of Drs. Mura, Torche, and Oliveira also enrich our understanding of these difficult aneurysms.

REFERENCES

1. Hosoda K, Fujita S, Kawaguchi T, Shose Y, Hamano S, Iwakura M. Effect of clot removal and surgical manipulation on regional cerebral blood flow and delayed vasospasm in early aneurysm surgery for subarachnoid hemorrhage. *Surg Neurol* 1999;51:81-8.
2. Inagawa T, Yamamoto M, Kamiya K. Effect of clot removal on cerebral vasospasm. *J Neurosurg* 1990;72:224-30.
3. Ohkuma H. Effect of clot removal and the different incidence of vasospasm between clipping and GDC. *Neurol Res* 2006;28:424-30.
4. Rabinstein AA, Pichelmann MA, Friedman JA, Piepgras DG, Nichols DA, McIver JJ, et al. Symptomatic vasospasm and outcomes following aneurysmal subarachnoid hemorrhage: A comparison between surgical repair and endovascular coil occlusion. *J Neurosurg* 2003;98:319-25.
5. Samson D, Batjer H, White J, Trammell T, Eddleman CS. Intracranial aneurysm surgery: Basic principles and techniques. New York, NY: Thieme; 2011.
6. Shirao S, Yoneda H, Ishihara H, Harada K, Ueda K, Sano Y, et al. Fate of clots in patients with subarachnoid hemorrhage after different surgical treatment modality: A comparison between surgical clipping and Guglielmi detachable coil embolization. *Neurosurgery* 2011;68:966-73.
7. Suzuki H, Taki W. Effect of aneurysm treatment modalities on cerebral vasospasm after aneurysmal subarachnoid hemorrhage. *Acta Neurochir Suppl* 2013;115:99-105.

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