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# Supraorbital Keyhole Approach for Clipping Ruptured Anterior Circulation Aneurysms

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The supraorbital approach is an important portal of intracranial entry, which gives access not only to the anterior base, but also to the sellar and parasellar region, and the vessels of the anterior circulation. Essentially miniaturization of the traditional pterional approach, supraorbital keyhole approach places minimalization as an important concept in the neurosurgeon's armamentarium. Keyhole craniotomy, like neuroendoscopy is the culmination of interplay of knowledge of neuroanatomy, neuroimaging, nature of the vascular lesion, optics and instrumentation, and operative neurosurgical skills. One should be able to "see" the angiographic anatomy in the operative field. Introduction of tube-shaft instruments for dissection and clip application has made this procedure possible. Saratchandra, *et al.*,<sup>[1]</sup> have highlighted how refinements in optics, microanatomy and operative techniques have led to almost all aneurysms of anterior circulation being amenable to clipping by supraorbital keyhole approach. The article reporting the largest series from India on the subject establishes the fact that although outcome between the traditional and minimally approaches may not differ, the minimal blood loss, low operative time, reduced hospital stay and overall patient satisfaction with the minimally invasive approach scores over the traditional approaches. Authors have added and standardized the orbital rim and roof component to the craniotomy. Earlier reported by Cavalcanti, *et al.*,<sup>[2]</sup> addition of orbital osteotomy improves the visualization of anterior communicating artery complex and internal carotid artery bifurcation by increasing the vertical angle of visualization without adding morbidity.

The important message given out in the article has been the selection criteria: preferably Grade I or II patients. The moot point is, however, the

critical self-appraisal of one's ability to work in narrow, confined spaces, with specialized tube-shaft microneurosurgical instruments. Wide opening of arachnoid spaces, including Sylvian fissure (irrespective of the location of aneurysm) is mandatory to achieve relaxation of the brain and passage to the aneurysm location. As with any other procedure, there is a learning curve with this approach, and the surgeon should be thoroughly familiar with normal as well as altered microanatomy of the vessels and the circle of Willis in the given patient. It also requires a calm and stable mindset that anticipates intraoperative aneurysmal rupture and has the plan to tackle it if it happens. There is always a fear of having to tackle intraoperative aneurysm rupture in narrow, confined space. The key to the problem lies in wide arachnoid dissection before tackling the aneurysm, frequent movements of the microscope, preparing self and the proximal feeder vessel for temporary clipping well in advance, and most important, managing with "two hands" instead of "three hands" in the operative field. Temporary clipping of the proximal vessel with one hand as the other hand keeps the field clear with a suction nozzle, can be accomplished.

Finally, a mention about an ongoing controversy about the choice of supraorbital keyhole minicraniotomy for aneurysm surgery as matter of principle. Saratchandra, *et al.*,<sup>[1]</sup> have effectively answered the question, clearly placing the surgical procedure as an effective and versatile approach in the Neurosurgeon's armamentarium, to be used as indicated. It is certainly not meant for all aneurysms of the anterior circulation, and selection of appropriate cases too is a learning process. One evolves with the procedures as much as the procedure evolves over a period of time. A neurosurgeon graduates to minimalism (frontotemporal – pterional – minicraniotomy). Supraorbital keyhole approach is certainly not

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advocated for residents and neurosurgeons-in-training.<sup>[3]</sup> They must first hone their operative skills and earn the rights of passage as they become proficient in arachnoid dissection in pterional approach and working through small narrow passages with low profile microinstruments becomes second nature.

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