Keyhole approach

Supraorbital keyhole approach

Supraorbital keyhole approach.

Among the various types of keyhole mini-craniotomy, supraorbital or lateral supraorbital mini-craniotomy is the standard and basic keyhole approaches. The lateral supraorbital keyhole provides adequate working space in the suprasellar to parasellar areas and planum sphenoidale area including the anterior communicating artery complex. Despite the development of neuro-endoscopic techniques and intra-operative assistant methods, the limited working angle to manipulate and observe deeply situated pathologies is a major disadvantage of the keyhole approaches. Neurosurgeons should understand that keyhole mini-craniotomy surgeries aim at “minimally invasive neurosurgery” but still carry the risks of malpractice unless we understand the advantages and disadvantages of these keyhole concepts and strategies [1].

Daniel D. Cavalcanti et al., from the Department of Neurosurgery, Paulo Niemeyer State Brain Institute, Rio de Janeiro, Brazil, retrospectively reviewed a database of patients with aneurysm from October 2013 to May 2016. Data were originally collected prospectively. The minisphenoidal approach has been progressively replacing the pterional approach for managing aneurysms in this department. Occlusion rates for ruptured and unruptured aneurysms were analyzed using late follow-up angiograms. Functional outcome assessment and the impact on quality of life were also measured.

They performed 124 minisphenoidal craniotomies in 117 patients to clip 147 aneurysms. Patient mean age was 53.9 years. Seventy patients (59.8%) presented with subarachnoid hemorrhage. Middle cerebral artery aneurysms represented 48% of the total number of aneurysms; posterior communicating artery aneurysms represented 24%. The minisphenoidal craniotomy was helpful in managing superior cerebellar artery aneurysms and 1 ruptured orbitofrontal artery aneurysm. We achieved an occlusion rate of 97.8%, with a mean follow-up of 13.2 months. Favorable outcomes were achieved for 79% of patients with subarachnoid hemorrhage and for 98% of unruptured patients.

Evolution of endovascular techniques has paved the way for minimizing surgical exposures. Routine use of the minisphenoidal approach for managing ruptured, unruptured, and previously coiled aneurysms is safe and provides adequate exposure with robust occlusion rates [2].

Books

Keyhole Approaches in Neurosurgery Volume 1 Concept and Surgical Technique

1)
Mori K. Keyhole concept in cerebral aneurysm clipping and tumor removal by the supraciliary lateral supraorbital approach. Asian J Neurosurg. 2014 Jan;9(1):14-20. Review. PubMed PMID: 24891885; PubMed Central PMCID: PMC4038860.

2)
Cavalcanti DD, de Paula RC, Alvarenga PL, Pereira PJDM, Niemeyer Filho P. Engaging in a Keyhole

Concept for the Management of Ruptured and Unruptured Aneurysms. World Neurosurg. 2017 Jun;102:466-476. doi: 10.1016/j.wneu.2017.02.044. Epub 2017 Feb 16. PubMed PMID: 28216398.