Key Hole Craniotomy: When, Where, and How to Apply?

The authors of this manuscript have presented the output of their review about “keyhole approach for cerebral aneurysms,” located mainly in the anterior circulation and have reviewed remarkable amount of references published during the previous 20 years as mentioned in the abstract. Reading this review might certainly be informative for the young neurosurgeons trying to get familiar with the content of relevant literature in this regard. Respectfully, there are few issues worthy to be added as an editorial to this manuscript.

I wonder if the review is either a systematic review or a type of meta-analysis? There is no flow chart, and two of the mentioned keywords do not match with the MESH linked with aneurysm surgery, i.e., “commonest anterior circulation aneurysm treated by keyhole approach” and “complete occlusion rate.” The “occlusion rate” is in common usage for endo-techniques and in comparing the outcome of endo-treatment and open surgery of cerebral aneurysms.

The introduction describes the objective of the researchers as conveying “the current concept and proper patient selection for such an approach.” They selected 17 manuscripts and analyzed their materials and then included a summary of those data in the form of three tables that are easy to be reviewed by the readers. In such kind of “narrative review,” the least would be to declare the characteristics for the inclusion of the manuscript selected for review, the level and the number of the reviewers for each manuscript and the type of statistical analysis used for comparing the outcome. The kind researchers have mentioned a summary of each manuscript in the discussion and apparently, the readers might reach a conclusion with neither reading the brief concept highlighted by the authors nor select any one of the references for further review.

The different modalities of the conventional frontal, frontotemporal, frontolateral, and low pterional craniotomies are the most frequently used approaches to the aneurysms of the anterior or posterior cerebral circulation. Selection among the possible routes is influenced by the personal interest and experience of the operating surgeon. The beneficiaries of keyhole surgery are mentioned by the authors but, for the surgeon who only occasionally operates with the surgeon’s philosophy of minimally invasive surgery and if the surgeon’s experience and technical skill allow such an approach to be taken. It has been estimated that 70% of operations will one day be carried out using this technique. It involves miniature cameras and long, coaxial instruments being inserted into the tiny hole and cistern, hardly kept opened by cerebrospinal fluid drainage and anesthesiologists if not bloody enough. The operation might be performed through a screen if endoscopic assistance is needed to shed light in the depth where microscope might not elucidate due to limitations of the axis of keyhole approach. As the authors mentioned, “keyhole surgery” started in the 1980s but unfortunately, has spread in an uncontrolled and haphazard way while formal training has been brought in only recently. There is no question that small approaches can minimize normal tissue disruptions and brain retraction. The small or minipterional approach offers a direct avenue for other lesions such as certain sphenoid wing and parasellar meningiomas, tumors of the
cavernous sinus and Meckel’s cave, orbital lesions, temporal lobe gliomas, and metastatic brain tumors.\textsuperscript{[1-5]}

In summary, the craniotomy should be only as large as necessary to guide instruments safely and effectively to the pathology.

\textbf{A. Amirjamshidi}

\textit{Department of Neurosurgery, Sina Hospital and Children’s Hospital, Tehran University of Medical Sciences, Tehran, Iran}

\textit{Address for correspondence:}

Prof. A. Amirjamshidi, Department of Neurosurgery, Sina Hospital and Children’s Hospital, Tehran University of Medical Sciences, Tehran, Iran.
E-mail: abamirjamshidi@yahoo.com

\textbf{References}


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