Minimally invasive techniques: the new frontier in neurosurgery

TO THE EDITOR: We have read with great attention the article by Park et al.8 (Park J, Son W, Kwak Y, et al: Pterional versus superciliary keyhole approach: direct comparison of approach-related complaints and satisfaction in the same patient. J Neurosurg [epub ahead of print March 2, 2018. DOI: 10.3171/2017.8.JNS171167]). We would like to congratulate the authors. It is indeed a very interesting paper, and we agree with many of the authors’ statements, e.g., the fact that both approaches are commonly used for cerebrovascular and skull base procedures. The authors analyzed data obtained from 21 patients during follow-up visits after surgery performed over an 11-year period. All patients included in the study had undergone an ipsilateral supraciliary keyhole approach and a contralateral pterional craniotomy for bilateral intracranial aneurysm surgery. Outcome measures included overall patient satisfaction as rated on a visual analog scale (VAS) and patient responses to a questionnaire covering 5 variables related to the surgical approaches: craniotomy-related pain, sensory symptoms, cosmetic complaints, palpable cranial irregularities, and limited mouth opening.5 They concluded that a supraciliary keyhole approach provides a much higher level of patient satisfaction than a pterional approach, despite the facial scar.1,2

However, we also noticed some methodologic and analytical issues that we think are worth discussing.

First, to compare clinical, functional, and aesthetic results of 2 surgical techniques, we agree that prospective randomized studies would have more impact than analysis of data from patients who underwent bilateral craniotomies (with two different approaches in each patient). In addition, the authors did not mention the follow-up time.2,3

Second, the long study period (11 years) may compromise data homogeneity, because the procedures could have been performed by different neurosurgeons, who might have used different techniques, causing bias.1,4

Third, the study may be statistically underpowered, since results were evaluated in only 21 cases. Additionally, loss to follow-up was not reported.

Fourth, they used only one simple scale (graduated 0–4) for the 5-item questionnaire and the VAS for overall patient satisfaction. We think that these measures are insufficient to evaluate clinical, functional, and aesthetic outcomes of 2 different approaches.5,6 Indeed, for more appropriate evaluation it would also be necessary to include other measures of outcome, such as quantitative radiological measures (percentage reduction in thickness and volumetric images), temporal muscle analysis, and functional outcomes (e.g., modified Rankin Scale or Oswestry Disability Index), at specific follow-up times. In addition, further comparisons, including complications such as incidence of frontalis muscle palsy, postoperative hemorrhage, cerebrospinal fistula, hydrocephalus, and mortality, would be interesting.4,5

Research in minimally invasive approaches in neurosurgery has exponentially increased in the past decade, and technological developments have led to improvements in precision and effectiveness.8 Nevertheless, many senior neurosurgeons remain reluctant to change their clinical practice for less-invasive alternatives. Currently, there is great concern regarding the reduction of invasiveness to avoid the complications inherent to large exposures, but there is still controversy about whether these techniques afford satisfactory surgical exposure when compared with conventional craniotomies.7

The key point is to use the most adequate technique for a particular patient, rather than using a one-size-fits-all approach for all patients. Minimally invasive approaches are the new frontier in neurosurgery, and technological innovation and integration are crucial to ongoing progress in the application of these techniques.9 Research like this study by Park and colleagues is important to support the selection of minimally invasive procedures.

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References
Multiple sclerosis–related tremor and stereotactic radiosurgery

TO THE EDITOR: We read with interest the article

References


Disclosure

The authors report no conflict of interest.

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Response

I really appreciate Rabelo and colleagues’ thoughtful comments on our article and would like to provide the following responses.

Surgical minimalism to reduce iatrogenic traumatization is a universal trend in most surgical fields. Since the concept of a keyhole approach was first advocated by Perneeczky and colleagues, a superciliary keyhole approach has been applied to many tumorous lesions in the parasellar region and anterior circulation aneurysms. However, superciliary keyhole surgery still raises major technical and cosmetic concerns. Indeed, the small cranial opening of a keyhole approach does create technical limitations. However, these limitations can be overcome by using appropriate surgical indications, slender surgical instruments, and optimized surgical techniques. Our previous surgical series including small unruptured aneurysms arising at the supraclinoid ICA, A1, ACoA, M1, and MCA bifurcation revealed excellent surgical outcomes. In addition, keyhole surgery facilitates tremor-free procedures as the surgical instruments are supported by the margin of the small cranial opening.

While previous studies have already shown favorable cosmetic outcomes, the current study aimed to compare the cosmetic concerns and approach-related complaints of patients who underwent both superciliary and pterional approaches. Thus, despite the limitations of the current study, the results can help transition cosmetic and approach-related concerns into confidence.

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