Editorial

Retractorless brain surgery

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The development of minimally invasive surgical tools such as radiosurgery and endovascular techniques has been paralleled by further evolution of traditional microsurgery and increasing attention to minimizing brain manipulation. Postoperative hypodensities on CT scans related to brain manipulation and/or retraction, once considered an acceptable price in some cases, are now considered (or should be considered) unacceptable. In this issue of the Journal of Neurosurgery, Drs. Spetzler and Sanai1 present the results of a prospective assessment of 223 consecutive cases of vascular lesions and skull base tumors in which the goal was to avoid the use of fixed retractors. They found that retractors were necessary only in 7 cases, and therefore more than 90% of the procedures could be completed successfully without fixed retraction. Some of the cases are illustrated in the article and in the accompanying videos.

The technique and strategy utilized in the presented cases are the results of a continuous evolution and the work of a surgeon with incredible experience and technical skills. Thus, this report should not be taken as an exhortation to reject, point blank, the use of fixed retractors. Many neurosurgeons have achieved excellent results with the routine use of retractors and often use gentle fixed retraction during the critical portion of a procedure, which allows the surgeon to dissect the pathology without the need to worry about retracting at the same time. However, the present article is an encouragement and a reminder, to push ourselves against our own habits, complacent and resistant to new technology and different strategies.

A couple of the technical factors mentioned by the authors deserve further emphasis. For retractorless surgery, the use of the mouthpiece to control the microscope is essential. Correct use of the mouthpiece not only frees the hands of the operator but also allows utilization of the microscope to its full potential. With the mouthpiece it is possible to adjust continuously the focal length of the microscope so that the target is constantly maintained under focus while using the highest magnification. Using the highest magnification helps in minimizing any damage to normal structures. The importance of preserving the pia-arachnoidal plane cannot be stressed enough. The pia-arachnoid provides a natural and fairly resistant barrier to mechanical manipulation and damage. Once this plane is violated even the most delicate contact with the parenchyma can create microtrauma and superficial oozing. To maintain the normal brain elasticity and consistency which facilitates dynamic retraction, it is also critically important to spare or minimize any venous sacrifice while opening the natural arachnoidal spaces and accessing the target.

The techniques and the concepts illustrated in the present article should constitute basic teaching in every modern neurosurgery training program. The push toward these principles should not be the result of a “quiet revolution” as the title implies; instead, daily acceptance and application of these basic principles (not necessarily the avoidance of fixed retractors at all cost) should be an integral part of any neurosurgery residency program. It is my impression that in this day and age of “working hours restrictions,” system-based learning, and Graduate Medical Education rules, the focus of many residency programs in North America is shifting more and more toward compliance with the rules rather than toward strict reinforcement of and adherence to the evolving basic principles of modern microsurgical techniques.

Disclosure

The author reports no conflict of interest.

References


Response

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We thank Dr. Lanzino for his insightful commentary. Our experience suggests that retractorless surgery can be the rule, not the exception, for nearly all intracranial lesions, including intraaxial and extraaxial mass lesions, as well as simple and complex vascular pathological entities. We hope this article will embolden others to consider this strategy as well.

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