Endoscopic third ventriculostomy

To THE EDITOR: I read with interest the recent article by Hailong et al. (Hailong F, Guangfu H, Haibin T, et al: Endoscopic third ventriculostomy in the management of communicating hydrocephalus: a preliminary study. J Neurosurg 109:923–930, November 2008). Neuroendoscopy is rapidly evolving. In particular, endoscopic third ventriculostomy (ETV) offers a promising future in the management of hydrocephalus given the known complications of ventriculoperitoneal shunting. Although variable success rates for ETV have been reported, many surgeons consider the procedure the treatment of choice in managing hydrocephalus in children.

Whereas ETV’s success in treating hydrocephalus has been widely reported, its efficacy in treating communicating hydrocephalus is mixed. Many studies have thus far focused on the role of the procedure in the pediatric population with little knowledge of its role in the adult patient group, and even then many of the studies have been conducted for obstructive hydrocephalus. The recent work by Hailong and his colleagues represents one of the few studies of the role of ETV in managing adult-onset communicating hydrocephalus.

Reasons for the observed success of ETV in communicating hydrocephalus are still largely unknown. It is very likely that all cases of hydrocephalus are actually obstructive at one point or another within the CSF pathways and that an ostium on the floor of the third ventricle bypasses an obstruction in the subarachnoid space. This has been postulated not only by Ranshoft and Rekate (as quoted by Hailong et al.), but also by Kehler and Gliemroth, who proposed an extraventricular intracisternal obstruction to CSF flow as an explanation for the success of third ventriculostomy procedures in communicating hydrocephalus. (DOI: 10.3171/2009.2.08152)

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Crossover trials


The authors’ study concerns the “Subarachnoid Aneurysm Trial (ISAT) era” in the United Kingdom. Such a valuable experience can certainly be referred into a more general viewpoint and specially a US outlook. Some comments with respect to study design of crossover trials in order to achieve this aim follow.

First of all, the authors’ data analysis revealed a “strong preference” for endovascular treatment for acute rupture of intracranial cerebral aneurysms (86.6 vs 13.4%), with a “progressively greater role for open microsurgery in the more elective context (57% endovascular vs 43% surgical).” In addition, they reviewed 66 interventions for arteriovenous malformations (AVMs), and found that open surgery was performed in only 6 of these 66 cases. They compared these data with data from 2001–2002 (pre-ISAT), and found similar proportions of surgically treated aneurysms versus endovascularly treated aneurysms, “but an increase overall in the number of patients requiring open surgery.” The authors found that “excellent outcomes” could be obtained with microsurgical clipping (in comparison with endovascular therapy) and observed that these and previously reported studies firmly prove an ongoing position for vascular neurosurgery as a subspecialty in association with a professional endovascular service and a multidisciplinary team, which includes but is not limited to neuroradiology and neuroanesthesia.

In light of these findings, it would be useful to design a clinical study in which those patients randomized to the control group could cross over to the interventional group after some pre-defined period of time or after meeting some sort of reasonable clinical (neurosurgical) end point. With respect to end points, there are proper concepts that we all ought to pay attention to. An “end point” does not mean the “measure” or “severity” of diseases alone, at least according to my viewpoint. There are indeed different end points in certain diseases, hence we ought to combine them and improve the informational content of categorical clinical trial end points.

The amount of time and the end point would, in fact, needed to be tailored to the particular disease—intra-cranial aneurysms or cerebral/spinal AVMs or even both, regardless of whether the patients are to be treated in the interventional radiology department or in the operating room.

It appears to be important to specify a practical suggestion about how the crossover data would be analyzed properly in those interventions that the authors have reviewed or the cases in their medical center. The primary analysis of such a study would have to be limited to the randomized patients, at least in the authors’ own data set from their medical center. It also appears to be significant

References

that the crossover data would potentially add information of estimates of radiological versus surgical or even medical (via medications alone) plus anesthetic risk individually or jointly in various combinations. Under such circumstances, a fair and objective observation of a better sensitivity or specificity should be attempted so that one can thus observe in order to justify the cutoff on clinical grounds, and bolster that with statistical evidence, not the other way around.2,3,5

In the case of a clinical trial of endovascular preventive treatment of unruptured intracranial AVMs or aneurysms, the ethical discussion is, as well, to be considered as follows. There is dubiousness of the clinical manifestation and prognosis. Prophylactic measures are frequently carried out in cases of unruptured intracranial AVMs and aneurysms. Nevertheless, measures in such an intervention have never been well recorded with comparison to cases treated in the traditional method. In a context of doubtfulness, the so-called “best selection of treatments” that can be provided to each participant (patient) is merely chances in regard to an obvious protection from an AVM or aneurysm rupture that the participant (patient) may possibly encounter.

To sum up, it appears to be well recognized that both ethical and practical issues hamper randomized trials in both invasive neuroradiology and neurosurgery; however, the crossover paradigm of a study design does not resolve these issues. The ethical and practical issue of how to properly deal with the control group in intervention studies, such as in both neurosurgery and interventional neuroradiology, merits further consideration.

References

RESPONSE: We are grateful to Dr. Tang for his interest in our paper and his insightful comments. We agree with his principal assertion that crossover trials in the operative versus endovascular management of cerebral aneurysms and AVMs would be a powerful research tool in the field. We also agree that statistical and primarily ethical considerations will be challenging and as a result such trials are unlikely to be performed in the most scientifically preferred manner, especially given the large practice and associated evidence base that has evolved in this field. For our part, we would like to stress that in the modern era, a multidisciplinary approach to the management of these lesions, informed by the best available evidence, will provide the best outcome for the patients. (DOI: 10.3171/2009.2.081619)

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Coil over clip

To The Editor: I read with great interest the article by François Proust and colleagues (Proust F, Martinaud O, Géradin E, et al: Quality of life and brain damage after microsurgical clip occlusion or endovascular coil embolization for ruptured anterior communicating artery aneurysms: neuropsychological assessment. J Neurosurg 110:19–29, January 2009).2 The authors compared cognitive outcome and frequency of brain damage between clipped and coil-embolized anterior communicating artery (ACoA) aneurysms. Among patients who underwent clipping, they found a statistically significant decrease in verbal memory and a statistically significant increase in encephalomalacia (encephalomalacia was found in the corpus callosum, frontobasal and frontomedial areas, temporal gyri, caudate nucleus, putamen, pallidum, and internal capsule). In my opinion these results may explain the occurrence of the so-called ACoA syndrome,1,2 which is likely due to the occlusion of the subcallosal branches (median artery of the corpus callosum and subcallosal artery) and hypothalamic branches of the ACoA.

In a previous article, the same group of authors3 suggested that the treatment modality for ACoA aneurysms should be dictated by the direction of the aneurysm sac; that is, anteriorly directed aneurysms should be clipped, whereas posteriorly directed aneurysms should be embolized with coils, because all branches and perforating vessels of the ACoA arise posteriorly.5,7 Despite the fact that the authors followed this “safe” policy, the previously mentioned significant outcome differences were found between clipping and coiling.4 As a consequence, one would expect an even more apparent rate of clinical and brain damage if all ACoA aneurysms (anteriorly and posteriorly directed) were clipped.

In general, I completely agree with the methodological, the results, and the discussion in this excellent article; however, I disagree with the conclusions. In fact, the authors conclude by saying that “the interdisciplinary approach remains a safe and useful strategy.” Based on the results of the study, the authors should have more meaningfully concluded that although the interdisciplinary approach remains a safe and useful strategy, coiling of an ACoA aneurysm is superior to clipping in terms of cognitive clinical outcome and brain damage.

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Disclosure
Dr. Guglielmi is the inventor of the GDC coils.

References
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