Editorial

International Study of Unruptured Intracranial Aneurysms

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In this issue, Mahaney and colleagues take another look at the patients enrolled in the International Study of Unruptured Intracranial Aneurysms (ISUIA).1 Published in full over a decade ago, with many follow-up reports since then, this prospective cohort study followed 1691 conservatively managed patients with unruptured intracranial aneurysms (UIAs) for at least 1 year, as well as 1917 surgically treated and 451 endovascularly treated patients. Figures 2 and 3 from the 2003 paper strongly suggested that, for microsurgically managed patients, age was a strong predictor of 1-year outcomes. In fact, combined morbidity and mortality, including neuropsychological deficits, was only 5% for patients less than 50 years of age, but more than 10% for those between 50 and 60 years, and 20% for those between 60 and 70 years. The rate of morbidity was greater than 30% for those older than 70 years of age. Most of the morbidity appears to have been in aneurysms larger than 12 mm, especially those in the posterior circulation. Figure 4 from that paper showed that the age effect was less of an issue with endovascular repair. In the current re-analysis of the primary data, the authors employ slightly different age cutoffs but again show that short-term outcomes appear to be better in older patients undergoing endovascular repair than microsurgical repair. While this may not appear surprising to those having read the original paper, the authors state that reports by others since have questioned whether older patients might be at greater risk for endovascular complications than younger patients. While these data would argue against this contention, the differing results might be explained by differences in technique and/or patient selection. Both factors might be expected to be operant here given how much has changed since the enrollment period of 1991–1998, in no small part as a result of the ISUIA.

For those looking to this paper to justify the treatment of UIAs, the data on 1-year aneurysm- and procedure-related morbidity and mortality appear to support treatment over watchful waiting as long as one avoids treating large aneurysms in those greater than 65 years of age with microsurgery. Given that direct clipping of such high-risk lesions has in many cases been replaced by improved bypass techniques or flow diversion, some might even argue that contemporary intervention is likely even more effective than the ISUIA data suggest. However, it is also possible that the widespread use of aspirin and statins has altered the natural history of UIAs, making them less dangerous than they were 20 years ago. This possibility, along with the well-documented decentralization of endovascular care together with the diminishing number of microsurgical cases available in training and practice, might lead one to a more pessimistic view of intervention.

Perhaps the most balanced reading of these data focuses on the fact that patients were selected rather than randomized for ISUIA treatments, at a time when devices and skill sets were markedly different than they are today. Efforts to “match” cohorts in a post-hoc manner, as might be done in a propensity analysis, while some utility, are unlikely to address all of the bias. While some have thus called for a prospective multicenter randomized trial to determine which of these world views is correct, it appears that an increasing number now concede that prospective national registries are more likely to identify best practices and guide improved patient selection. The National Neurosurgery Quality and Outcomes Database (N3QOD) vascular module is one such registry that should provide this type of insight in the years to come.

Disclosure

The author reports no conflict of interest.

Reference


Response

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We thank Dr. Connolly for his thoughtful comments. We agree with his assertion that our findings might be...
used to support treatment of UIAs, but cautiously advise that each patient must be considered individually, accounting for established risk factors for hemorrhage and treatment such as aneurysm site and size. A patient’s age should always be considered as the decision regarding optimal management is made, and in patients > 65 years of age, the risks of intervention may often be greater than risks of conservative management. In those older patients selected for interventional management, endovascular treatment might be more appropriate. Advances in endovascular treatment, such the advent of flow diversion devices, may offer a greater treatment armamentarium for older patients with high-risk, difficult-to-treat aneurysms. We also emphasize the finding that the only age group for whom aneurysm treatment conferred a survival advantage at 1 year was the group of patients < 50 years old. Thus, our findings might specifically be used in support of consideration for treatment of younger patients (< 50 years old) with UIAs, for whom interventional treatment would otherwise be appropriate. In this group, surgical treatment may be preferred.

Dr. Connolly also raises the issue of technique and surgical selection as determinants of outcome. Both undoubtedly influence outcomes, and while this type of bias might be eliminated in a randomized controlled trial, both technique and surgical selection are inherent variables in day-to-day practice and should be taken into consideration. While a randomized controlled trial might offer the best evidence regarding management of UIAs, it is unclear if such a trial will be fundable or supported by clinicians. In the absence of such a trial, prospectively collected data provides the next best level of evidence.

Surgical selection may result in a bias of better outcomes in the surgical group, as surgical treatment may be reserved for healthier patients and endovascular treatment may be viewed as an option for patients not healthy enough for open surgery. It is likely that this effect is noted in this study as well as in actual day-to-day clinical practice. With regard to technique, evolving endovascular practice may reflect both improved techniques in contemporary practice as well as increased variability in care for patients treated with endovascular techniques. The later variability may be due to decentralization of endovascular treatment, resulting in operator-dependent and site-dependent differences in outcome, with site-dependent differences a reflection of quality of care at high-volume tertiary medical centers compared with low-volume community medical centers.2

References


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