De novo aneurysms

GIUSEPPE LANZINO, M.D.

Department of Neurologic Surgery, Mayo Clinic, Rochester, Minnesota

De novo aneurysm formation is a well-known phenomenon. Its true incidence is relatively low, and identifying risk factors for new aneurysm formation may allow targeted follow-up of those patients at higher risk. When a “de novo” aneurysm is found, there are no data to inform us regarding the risk of bleeding, although there is a general tendency to consider these newly formed aneurysms as a “more aggressive” category.

In their article in this issue, Kemp and coworkers1 try to assess the risk of hemorrhage from de novo aneurysms in a series of 37 patients with 42 de novo aneurysms. These patients were identified from a prospectively maintained database with over 4700 aneurysms evaluated and/or treated since 1976. However, de novo aneurysm formation could be assessed in only 611 patients (13%) who had “adequate follow-up imaging studies beyond the initial perioperative period.” Of course, this shortcoming introduces important biases that limit the interpretation of the data provided. Since the majority of patients lacked consistent follow-up imaging, we cannot make any conclusion regarding the true incidence of de novo aneurysm formation in their series.

Ten of the 42 aneurysms in Kemp and colleagues’ study were associated with subarachnoid hemorrhage. Based on these 10 cases, the authors try to calculate the rate of bleeding from de novo aneurysms. The calculation is erroneous, and the risk of bleeding of a de novo aneurysm cannot be extrapolated from the data provided. The time at risk is calculated beginning from the date of the last imaging study documenting no aneurysm (in other words “the clock is started” before the aneurysm has actually formed). Moreover, the rate of hemorrhage reported is probably artificially high because a) we do not know the true number of patients with de novo aneurysms (only 13% of patients had adequate follow-up imaging); and b) patients with hemorrhage had no choice but to seek medical attention, whereas patients with unruptured de novo aneurysms may have avoided the recommended follow-up and these de novo aneurysms would never be discovered unless the patients suffer a hemorrhage.

Overall, this study underscores the serious limitations intrinsic to these types of analysis. While I agree with the authors that de novo aneurysms should be considered more seriously than true incidentally discovered aneurysms, this statement is based on personal biases rather than solid data.

Reference


Response

DANIEL H. FULKERSON, M.D.,1,3 THOMAS J. LEIFZIG, M.D.,2,3 AARON A. COHEN-GADOL, M.D., M.S.C.,2,3 AND TROY D. PAYNER M.D.2,3

1Division of Pediatric Neurosurgery, 2Department of Neurological Surgery, Indiana University School of Medicine; and 3Goodman Campbell Brain and Spine, Indianapolis, Indiana

We would like to thank Dr. Lanzino for his thoughtful comments and criticisms of our manuscript. While we agree with him on many points, we would like to submit a few comments.

We too were disappointed by the small size of the cohort gleaned from our database of over 4700 patients. Relatively few patients fulfilled the strict inclusion criteria and a smaller number still had adequate long-term follow-up radiographic studies. Unfortunately, this is a common problem in the surgical literature on intracranial aneurysms. There are surprisingly few papers detailing long-term imaging outcomes after surgical treatment. We agree that our data do not support a calculation of the incidence of formation of de novo aneurysms. We specifically address this in the paper. We refer the reader to other prospective studies that estimate the incidence to be approximately 0.37%—4.15% per year.1,3,5,6

Rather than calculate the risk of formation of de novo aneurysms, we attempt in our paper to describe their char-
acteristics. Given the rarity of the problem, the numbers of patients in previous studies with de novo aneurysms are small. The largest cohorts we found in the literature were 19 patients.1,6 Therefore, we tried to identify a relatively large group of patients with de novo aneurysms: 37 patients with 42 aneurysms. We feel the finding that all de novo aneurysms in our study were “small” is an important consideration. We also consider our estimation that the hemorrhage risk was greater than the estimated hemorrhage risk of small incidentally found aneurysms to be a salient point.

We agree that our results should be interpreted as an estimate only. Dr. Lanzino correctly points out the problems with calculating a rate of hemorrhage based on the last normal radiographic study. An aneurysm prone to rupture may form and bleed quickly, whereas others of similar size may lie quiescent for years. The only way to truly answer this question would be to obtain an (in our opinion) impractical amount of imaging studies. Our calculations of the rate of hemorrhage are based on methods used in previously published papers.2

We again agree that our data have inherent limitations and are prone to bias. We encourage the reader to interpret our conclusions as suggestions. We also argue that “Level 1” evidence is still difficult to interpret. We would use the criticism leveled against two “Level 1” studies in aneurysm literature (ISUIA [International Study of Unruptured Intracranial Aneurysms] and ISAT [International Subarachnoid Aneurysm Trial]) as evidence.4,7

The patient in the office with a de novo aneurysm is likely not to care about levels of evidence in the literature. The patient wants to know what the surgeon believes is the appropriate treatment strategy. The surgeon, therefore, must render an opinion despite imperfect data. It is interesting that Dr. Lanzino’s last sentence in the editorial states, “While I agree with the authors that de novo aneurysms should be considered more seriously than true incidentally discovered aneurysms, this statement is based on personal biases rather than solid data.” We feel our data agrees with and supports this assertion.

References

Please include this information when citing this paper: published online October 12, 2012; DOI: 10.3171/2012.5.JNS112265.