

Commentary

The authors present a series of 6 patients, all of whom had subarachnoid hemorrhage (SAH) from a ruptured aneurysm and developed vasospasm resistant

to standard treatment and resistant elevations in intracranial pressure (ICP).^[1] These patients received early treatment with decompressive craniectomy (DC).

There are several key points of this report that we should keep in mind. One is that the patients received early (immediate) decompression when indications arose, without a delay of up to 48 hours, or longer, as in other reports referenced by the authors. Also of importance is that surgery was done based on ICP and radiographic evidence of resistant vasospasm, not on a requirement of clinical deterioration. This is a key distinction and may be responsible, to a large degree, for the 50% success rate of favorable outcomes (mRS of 3 or less) reported by the authors. To some, this observation would be intuitive, but to influence clinical practice, it must be documented, and for doing so, we should thank the authors of this report.

Another important nuance in the report^[1] is the number needed to treat in order to realize a favorable outcome. The patients in this report were not necessarily heading toward a mortal complication if they had not received DC, but stood a high chance of developing undesirable morbidity. The number needed to treat of 2 (50% of the 6 patients realized the favorable outcome of mRS score 1-3) is an excellent number and should be taken seriously. Although this is a small study and with a larger sample size the number needed to treat could be quite different, this study is relevant to the larger discussion and informs thinking as we move forward.

Dorfer *et al.*^[2] report a larger retrospective analysis of over 900 patients, many of whom underwent DC at various stages during their course of treatment following SAH. Patients receiving DC for aneurysmal-associated hematoma management fared better than those undergoing DC for treatment of SAH-related ischemic stroke, and this included patients who received DC early or late in their course. When taken together, the current report and Dorfer's data suggest that DC for ICP in patients suspected to have vasospasm may promise outcomes similar to those seen in patients undergoing DC for hematoma management and thus avoiding the outcomes of patients who suffer SAH-associated ischemic stroke. Of course we remember that SAH-associated ischemic stroke is often thought to be the natural history of vasospasm.

Otani *et al.*^[3] report a series of 12 patients who underwent microsurgical clipping of an aneurysm in the setting of SAH (1 patient did not have SAH) and acute subdural hematoma (SDH). Five of the 12 patients had a good recovery by the Glasgow Outcome Scale. It could be argued that the recovery in Otani's dataset was due to SDH evacuation, although other processes, such as lowering ICP and vasospasm prophylaxis, could be considered. When examining the Otani data more

closely, it becomes evident that 1 out of the 6 patients who developed vasospasm had a favorable outcome; that is a rate of 17%, much worse than the 50% reported by the authors of the current article. This illustrates the complexity of studying such variables.

The report (subject of this commentary)^[1] is a small case series; however, this is a very specific subset of a busy cerebrovascular surgery service (306 total patients undergoing surgery for anterior circulation aneurysms over 9 years). It could be argued that this study is too small and that we, as a medical community, need to work for statistical significance before drawing conclusions that may influence medical practice. No one center, or even a reasonably sized group of centers, can hope to accrue enough patients for statistical testing and accurate determination of statistical significance in studies such as this one. Kreiter *et al.*^[4] published calculations of the sample size needed to show statistical significance in questions relating to SAH and vasospasm. Such a sample would include 5000 patients or more. No subject such as DC in SAH patients who develop medically refractory vasospasm and ICP will ever reach the traditional statistical significance levels. Thus, we must rely on studies such as this, and the meta-analysis based on such, to guide advancement in the field of SAH management.

The surgical procedure described by the authors of this report^[4] is sound, and there did not appear to be deviations from the standard of care for SAH patients. The only true variable is that patients received DC, which, based on the results of this paper, is a powerful treatment option in the management of this specific patient population. The authors of this paper have added to the body of knowledge on the treatment and management of SAH and its natural history.

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References

1. Tuzgen S, Kucukyuruk B, Aydin S, Ozlen F, Kizilkilic O, Abuzayad B. Decompressive craniectomy in patients with cerebral infarction due to malignant vasospasm after aneurysmal subarachnoid hemorrhage. *J Neurosci Rural Pract* 2012;3:251-55.
2. Dorfer C, Frick A, Knosp E, Gruber A. Decompressive hemicraniectomy

after aneurysmal subarachnoid hemorrhage. *World Neurosurg* 2010;74:465-71.

3. Otani N, Takasato Y, Masaoka H, Hayakawa T, Yoshino Y, Yatsushige H, *et al.* Clinical characteristics and surgical outcomes of patients with aneurysmal subarachnoid hemorrhage and acute subdural hematoma undergoing decompressive craniectomy. *World Neurosurg* 2011;75:73-7.
4. Kreiter KT, Mayer SA, Howard G, Knappertz V, Ilodigwe D, Sloan MA, *et al.* Sample size estimates for clinical trials of vasospasm in subarachnoid hemorrhage. *Stroke* 2009;40:2362-7.

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