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## Commentary

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See the article "[Decompressive craniectomy in patients with cerebral infarction due to malignant vasospasm after aneurysmal subarachnoid hemorrhage](#)" on page 251.

The authors present clinical results of decompressive craniectomy (DC) as a lifesaving procedure in patients with cerebral infarction secondary to vasospasm and SAH.<sup>[1]</sup> We all know for a long time that DC lowers ICP in patients with an intractable increase in pressure following brain trauma or cerebral infarction and can be used safely in patients with malignant middle cerebral artery infarctions of the MCA.<sup>[2,3]</sup>

Brain swelling after SAH can occur early after the ictus (primary) and later as a result of complications associated with SAH (secondary, as a result of bleeding or cerebral infarction due to vasospasm). There is some evidence of space-occupying brain swelling without bleeding or infarction.<sup>[4]</sup> Regardless of its origin, brain swelling is known to worsen outcomes after SAH.<sup>[5]</sup> Whether DC can have positive effects not only in survival rates but also in neurologic outcomes remains controversial because of lacking evidence.<sup>[4]</sup>

This was a retrospective study with all problems and biases inherent to that. Given the study design without a control group against which to compare this experience, it is not clear that the conclusion of this paper is supported by the data presented. However, the substance of the paper and aspects of the findings deserve publication and will provide substance for discussion. Here are some noteworthy observations about this study:

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- Medical treatment of increased ICP is highly significant and often effective. This raises the question of how aggressive was medical therapy that these patients had. If they would be pushed a little harder, could we have a better ICP control without having them taken to the operating room? Could repeated intra-arterial drug injections have a positive influence on these patients outcome?
- We are starting seeing more and more complications of craniectomy. The authors had no data in this regard and have not mentioned on that, but the issue of the “sinking skin flap” syndrome, subdural hygromas, etc. after craniectomy remains a very compelling one. Moreover, we have to consider complications subsequent to the second procedure of cranioplasty.
- Long term outcomes of DC may be dictated by age, post-op ICP control and extend of subtemporal decompression.[6] The impact of these different factors upon outcome could not be elucidated in this paper. Another important issue is the optimal timing for DC, which must still be defined.
- For patients receiving DC, the question always arises whether surgery was necessary. A lot of patients may have a decompression that was not necessary because their CT scans aren't that bad and their neurological exam was good, and there are poor cases where regardless of what we are going to do, they will have a poor neurological outcome. Many of these cases will probably not die of an ICP-related death. The appropriate use for a DC is somewhere in the middle, and we still have a lot of work to do to clarify this issue.
- According to the data of the DECRA Study, in patients with severe diffuse traumatic brain injury and increased intracranial pressure that was refractory to first-tier therapies, the use of DC, as compared with standard care, decreased the mean intracranial pressure and the duration of both ventilatory support and the ICU stay but was associated with a significantly worse outcome at 6 months.[7] The role of DC in other indications such as cerebral infarction secondary to vasospasm and SAH should be further discussed in the light of these publications.

Hopefully, in a not too distant future, we will be able to discuss the results of randomized controlled studies on DC; in the meantime, studies like the present one give us insight in some different aspects and indications of DC. The present study analyzes the outcome of a very small cohort of consecutive patients with secondary DC after cerebral infarction due to malignant vasospasm, nevertheless it provides comprehensive clinical material that may guide clinical treatment.[1] The authors deserve credit for studying DC in this group of severely ill patients with vasospasms after SAH and hopefully will proceed with extended retrospective or prospective data-gathering. Altogether, careful decision-making is needed, and DC is a valid option in the treatment of these patients.

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