The 'skull flap' for decompressive craniectomy: A gap between concept and practice?

In this manuscript, Chibbaro *et al*.[1] report an innovative approach for performing a decompressive craniectomy, which may prevent some of the complications related to this procedure and obviates the need for cranioplasty. Complications after a decompressive craniectomy are not uncommon and include external herniation (usually because of too small a decompression), delayed hematoma, subdural effusion, hydrocephalus, syndrome of the threphined and infection. Some of these (hydrocephalus, subdural hematoma, syndrome of the trephined) are likely related to the unphysiological intracranial pressure relationships following a decompressive craniectomy. Subdural effusions are reported in 5.4-32.6% of cases, hydrocephalus in approximately 11% and syndrome of the trephined 13%.[2-6]

Clinical experience is that these complications, likely related to decompressive craniectomy, often resolve following cranioplasty. It would, therefore, not appear unlikely that these complications may be prevented or mitigated with the use of the technique described in which the bone flap is elevated bur not removed. This would, however, need to be proven in clinical studies.

Conceptually, the approach described is therefore of interest. The studies have as yet, however, only been performed in cadaver. Despite the conceptual interest, implementation in clinical practice may prove to be problematic or even impossible: First, the additional volume created with this approach will be much less than with a traditional craniectomy and bone removal, as the elevation of the bone flap obtained is limited to 1.2-1.5 cm. It is doubtful whether the degree of decompression obtained will indeed be sufficient to allow a sustained control of raised intracranial pressure.

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Second, in many cases it may be difficult to close the skin over the elevated bone flap without risk of wound dehiscence or skin erosion. Although the authors did not encounter any problem in skin closure in the cadaver studies, in TBI patients the skull is often swollen and this may present difficulties. Third, in the technique described a wire is led externally and remains in place in order to release the locking of the skull flap for cranioplasty. This inherently involves a certain risk of infection and this risk would need to be thoroughly evaluated when considering clinical implementation.

In summary, the concept presented is interesting but still far removed from clinical application.

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