Osteoplastic decompressive craniotomy

see also Decompressive craniectomy.

However, there is a myriad of complications due to the absence of the bone flap. A technique, four quadrant osteoplastic decompressive craniotomy (FoQOsD) retains the bone flap while achieving adequate cerebral decompression.

A single-center randomized controlled trial of 115 patients with TBI from the King Georges Medical University, Lucknow needing decompressive surgery was conducted. Of them, 59 underwent DC and 56 underwent FoQOsD. The primary outcome determined was functional status at six months using the Extended Glasgow outcome scale extended (GOS-e).

No significant differences were identified in baseline characteristics between both groups. Mean GOSe score was comparable at six months (4.28 in DC vs 4.38 in FoQOsD, p-value 0.856). Further, 22 of 58 patients in DC group had expired (38%) compared to 25 of 55 patients in FoQOsD group (44.6%), odds ratio 1.19 (95% CI 0.6 to 2.36), p = 0.6 (1 patient lost to follow up in each group). Favourable outcome was seen in 56.8% of patients in DC group vs 54.4% patients in FoQOsD group, p=0.74. Presence of intraventricular hemorrhage and sub-arachnoid hemorrhage (OR 7.17, 95% CI 1.364-37.7; p-value 0.020), opposite side contusions (OR 3.838 95% CI 1.614-9.131; p-value 0.002) and anisocoria (OR 3.235, 95% CI 1.490-7.026; p-value 0.003) pre-operatively were individual factors that played a significant role in final outcome.

FoQOsD is as efficacious as conventional DC with the added benefit of avoiding a second surgery. The procedure is associated with better cosmesis and fewer complications ¹⁾.

Hsu et al. redesigned decompressive craniectomy and cranioplasty procedures to decrease the inherent risk of complications. This novel technique called decompressive cranioplasty, not only may decrease the complication rate but also may improve the cosmetic result, obviate the need for artificial skull implant, and increase the decompressive volume compared with traditional craniectomy.

In decompressive cranioplasty, the Agnes Fast craniotomy was adopted without cutting the temporalis muscle from the underlying bone flap. After opening the dura with or without removal of intracranial hematomas, duraplasty was performed with an intracranial pressure monitor inserted. Four mini plates were bent into a "Z" shape, and the vascularized bone flap was elevated approximately 1.2-1.5 cm above the outer cortex of the skull and fixed with the mini plates. Subsequent cranioplasty was done with a mini-incision on the miniplate sites and reshaping of the miniplate to align the outer cortex of the bone flap.

They successfully performed decompressive cranioplasty in 3 emergent cases-2 traumatic subdural hematomas and 1 malignant middle cerebral artery infarction. Postoperative brain computed tomography demonstrated adequate decompression in all cases. Cosmetic outcome was excellent, and there was no temporal hallowing. Mastication function was not affected. At 6-month follow-up, there was no bone flap shrinkage and no hydrocephalus.

Decompressive cranioplasty is a safe and effective method in the management of patients with brain edema and intracranial hypertension. It is simple to perform and may reduce the morbidity associated with traditional decompressive craniectomy and subsequent cranioplasty ².

Unclassified

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