Hemicraniectomy

- Bone Graft Expansion in Cranioplasty Using a Split-Bone Technique
- Pre- and post-cranioplasty hydrocephalus in patients following decompressive craniectomy for ischemic stroke: a systematic review and meta-analysis
- Theophylline can resolve refractory acute negative-pressure hydrocephalus: illustrative case
- Paroxysmal Cortical Slowing Predicts Posttraumatic Epilepsy After Severe Traumatic Brain Injury
- Thrombectomy for Patients With Large-Volume Ischemic Stroke: A Systematic Review and Meta-Analysis of 6 Randomized Trials
- Iatrogenic Cranial Pseudomeningocele on the Stroke Unit: A Lesser-Known Potential Complication After Decompressive Hemicraniectomy Following Malignant Middle Cerebral Artery Syndrome
- AI-Driven Information for Relatives of Patients with Malignant Middle Cerebral Artery Infarction: A Preliminary Validation Study Using GPT-4o
- Timing of starting anticoagulation following decompressive surgery for cerebral vein and sinus thrombosis: An observational study

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Decompressive craniectomy of one side.

Although it was still performed with some frequency prior to the twentieth century, its resurgence in modern form became possible only upon the development of precision cutting tools and sophisticated post-operative care such as antibiotics.

Though the procedure is considered a last resort, some evidence suggests that it does improve outcomes by lowering intracranial pressure (ICP).

A large frontotemporoparietal DC (not less than 12 x 15 cm or 15 cm diameter) is recommended over a small frontotemporoparietal DC for reduced mortality and improved neurologic outcomes in patients with severe TBI.

Data suggest that unilateral decompressive craniectomy (DC) has superiority in lowering ICP, reducing the mortality rate, and improving neurological outcomes over unilateral routine temporoparietal craniectomy. However, it increases the incidence of delayed intracranial hematomas and subdural effusion, some of which need secondary surgical intervention. These results provide information important for further large and multicenter clinical trials on the effects of DC in patients with acute post-traumatic BS [1)].

Indications

Hemicraniectomy Indications

Technique

Hemicraniectomy surgical technique.

Complications

Hemicraniectomy Complications.

Case series

A total of 248 patients who underwent DHC were included in the study, with 155 patients (62.5%) in the SQ group and 93 (37.5%) in the discarded group. Patients in the discarded group were more likely to have a diagnosis of severe TBI (57.0%), while the most prevalent diagnosis in the SQ group was malignant stroke (35.5%, $p < 0.05$). There were 8 (5.2%) abdominal surgical site infections and 9 (5.8%) abdominal hematomas. The AC group had a significantly higher reoperation rate (23.2% vs 12.9%, $p = 0.046$), with 11% attributable to abdominal reoperations. The average cost of a reoperation for an abdominal complication was $40,408.75 ± $2273. When comparing the AC group to the SC group after cranioplasty, there were no significant differences in complications or surgical site infections. There were 6 cases of significant bone resorption requiring cement supplementation or discarding of the bone flap. Increased mean operative charges were found for the SC group compared to the AC group ($72,362 vs $59,726, $p < 0.001$).

Autologous bone flaps may offer a cost-effective option compared to synthetic flaps. However, when preserved in abdominal SQ tissue, they pose the risk of resorption over time as well as abdominal surgical site complications with increased reoperation rates. Further studies and methodologies such as cryopreservation of the bone flap may be beneficial to reduce costs and eliminate complications associated with abdominal SQ storage [2)]

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Qiu W, Guo C, Shen H, Chen K, Wen L, Huang H, Ding M, Sun L, Jiang Q, Wang W. Effects of unilateral decompressive craniectomy on patients with unilateral acute post-traumatic brain swelling after severe traumatic brain injury. Crit Care. 2009;13(6):R185. doi: 10.1186/cc8178. Epub 2009 Nov 23. PubMed PMID: 19930556; PubMed Central PMCID: PMC2811943.
2)
Dowlati E, Pasko KBD, Molina EA, Felbaum DR, Mason RB, Mai JC, Nair MN, Aulisi EF, Armonda RA. Decompressive hemicraniectomy and cranioplasty using subcutaneously preserved autologous bone flaps versus synthetic implants: perioperative outcomes and cost analysis. J Neurosurg. 2022 Apr 29;137(6):1831-1838. doi: 10.3171/2022.3.JNS212637. PMID: 35535843.