Autologous bone flap cranioplasty timing

see also Cranioplasty timing.

The risk of aseptic bone resorption lessens the longer the period of time elapsed between decompressive craniectomy (DC) and cranioplasty (CP). Age does not reveal a significant value, but statistical analysis shows that there is a clear trend [1].

Although generally accepted concept about the timing of cranioplasty using autologous bone is that early cranioplasty has more risk of infection and delayed cranioplasty has the risk of non-union or resorption of the bone flap.

There is an increasing body of evidence in the recent literature, which demonstrates that cranioplasty may also accelerate and improve neurological recovery. Although the exact pathophysiological mechanisms for this improvement remain essentially unknown, there is a rapidly growing number of neurosurgeons adopting this concept.

Cranioplasty performed between 15 and 30 days after initial craniectomy may minimize infection, seizure, and bone flap resorption, whereas waiting > 90 days may minimize hydrocephalus but may increase the risk of seizure [2].

Cranioplasty procedures should be performed at least 14 days after initial craniectomy to minimize infection risk. Obtaining intraoperative bone cultures at the time of craniectomy in the absence of clinical infection should be discontinued as the culture results were not a useful predictor of post cranioplasty infection and led to the unnecessary use of synthetic prostheses and increased Healthcare costs [3].

Shin et al. observed new bone formation on all the frozen autologous bone flaps that were stored within 8 weeks. The timing of cranioplasty may show no difference in degree of new bone formation. Not only the healing period after cranioplasty but the time interval from craniectomy to cranioplasty could affect the new bone formation [4].

References

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