Subgaleal Drains Offer Protection against Infection in Autologous Cranioplasty, Regardless of Defect Size

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BACKGROUND: Decompressive craniectomy is a procedure used in the treatment of intracranial hypertension due to intracranial hemorrhage, traumatic brain injury, or neoplasm. Once the brain swelling has adequately subsided, a cranioplasty is performed to restore protection and prevent clinical impairments associated with craniectomy. While autologous bone is often the first choice in cranioplasty, infection is a common complication, with reported rates up to 25%. Treatment typically involves removing the bone flap, long-term antibiotic therapy, and delayed secondary cranioplasty to reduce risk of recurrent infection. While the incidence and management of infection are well-documented, risk factors of infection remain contentious. Gaining a better understanding of these factors and managing patients accordingly may lead to reduced infection rates and decreased need for extensive antibiotic treatment and secondary operations. The current study aims to identify predictors of infection following autologous cranioplasty.

METHODS: A retrospective analysis was conducted on patients who underwent decompressive craniectomy and cranioplasty using cryopreserved autologous bone flaps between 2010 and 2020. Patient demographics and factors related to both surgeries and infection rates were recorded from patient records. Possible predictors included smoking status, age, comorbidities, reconstructive time interval, cranioplasty closure method, CSF leak, placement and duration of subgaleal drain following reconstruction, length of admissions, and procedure duration for each surgery. Logistic regressions were conducted to determine which patient and surgical factors were implicated in the development of infection.

RESULTS: In our cohort, 126 patients underwent autologous cranioplasty, with an 86% implant survival rate. A total of 10 (7.9%) patients developed an infection following reconstruction, five of whom required implant removal and secondary cranioplasty. The remaining five were treated with either IV or PO antibiotics. One patient returned to the operating room for wound irrigation and debridement. The median time to infection was 27 days. Regression analysis identified placement of subgaleal drain following cranioplasty as a protective factor (OR: 0.16, P = 0.007) against development of infection. The other identified factors, including reconstructive time interval and duration of drain insertion, did not contribute to risk of infection. Of the patients who received a subgaleal drain following cranioplasty, 13% developed an infection, compared with 21% in patients who did not have a drain. On average, drains remained in for 3 days. There was no significant difference between length of drains for those with infection versus those without (P = 0.757). The most commonly implicated pathogens were coagulase-negative Staphylococcus and Staphylococcus aureus.

CONCLUSIONS: Autologous cranioplasty is a fairly successful procedure with a survival rate of 86%. The current study demonstrates an infection rate of 7.9% following autologous cranioplasty, which is consistent with the current literature. Half of the patients who experienced an infection ultimately required removal of the implant, while the other half were successfully treated with antibiotics. We found an 84% decrease in the odds of developing an infection in patients with a drain compared with those without. These findings suggest that subgaleal drains should be considered in all patients undergoing autologous cranioplasty regardless of defect size in order to help reduce the risk of infection.

Is ERAS for Everyone?: A Comparison of Pain Control Outcomes across Veau Classifications following Primary Palatoplasty

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BACKGROUND: Patients undergoing primary palatoplasty generally rely on narcotic medication for pain control. However, there are concerns with over-medication, sedation, respiratory depression, sensitization to pain, and