Complications After Cranioplasty are More Common In The Presence of a Preexisting Ventriculoperitoneal Shunt: A Systematic Review and Meta-Analysis

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Introduction
Hydrocephalus can occur following decompressive craniectomy, often requiring placement of a ventriculoperitoneal shunt (VPS) prior to cranioplasty. Recent studies have analyzed risk factors leading to complications following cranioplasty, but these findings vary. Presence of a VPS has been recognized as one such factor. We report a systematic review and meta-analysis comparing complication rates in patients undergoing cranioplasty with the presence or absence of a VPS.

Methods
Following PRISMA guidelines, we performed a systematic search of PubMed as of March 2016. Articles were included if they reported complications related to cranioplasty after decompressive craniectomy and recorded the absence or presence of a VPS at time of cranioplasty with at least 20 patients. Primary outcomes were infection and resorption. For articles reporting events, odds ratios (OR) and confidence intervals (CI) were calculated. For articles only reporting OR and CI, these were used to calculate standard error. Data was pooled using the Mantel-Haenszel method (fixed-effects, inverse variance weight).

Results
Six of 93 studies met inclusion criteria (total 1417 patients, 164 shunts). The presence of a VPS was associated with increased rate of resorption often requiring reoperation (5 studies, 1304 patients, OR 6.07, CI 3.97-9.30, p<0.001) and with increased rate of infection (3 studies, 467 patients, OR 4.87, CI 2.35-10.10, p<0.001).

Learning Objectives
By the conclusion of this session, participants should be able to:

1) Identify the presence of a ventriculoperitoneal shunt (VPS) at time of delayed cranioplasty as associated with increased incidence of resorption and infections.

2) In susceptible patients, discuss the appropriateness of using non-resorptive synthetic implants, extended perioperative antibiotics, and additional infection precautions.

References