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CAT block 4

Citation: Hutchinson, P., et al. Trial of Decompressive Craniectomy for Traumatic Intracranial Hypertension. NEJM. 2016 Sep 22;375(12):1119-30.

Clinical Question: Does secondary decompressive craniectomy (a procedure in which part of the skull is removed and dura is opened) in trauma patients with severe TBI with increased cerebral hypertension improve outcomes?

Methods: This was an international, multicenter, parallel group randomized trial, where last-tier decompressive craniectomy was compared to medical management. Patients were between 10 and 65 years old with a known TBI and an abnormal CT scan. An ICP monitor was already in place, and the patients has intracranial pressure >25 mm Hg for between 1 and 12 hours, despite optimal medical management (head elevation, ventilation, ventriculostomy, mannitol, diuretics, hypothermia, etc). At this time, patients were randomized in a 1:1 ratio to two groups, a surgical group or a medical group. The medical group was allowed to use barbiturates at that point. Patients with fixed, dilated pupils, bleeding diathesis or unsurvivable injuries were excluded. Trial sites require 24 hour neurological services. Surgical treatment was a type of craniectomy, which was left to discretion of the surgeons. Primary outcome was a measure of functional independence, the extended Glasgow Outcome Scale at 6 months s/p randomization. Secondary outcomes were results at 12 and 24 months, as well as mortality at 6,12, and 24 months and quality of life at 6,12, and 24 months.

Results: 2008 patients were assessed for trial, 409 patients in 52 centers in 20 countries underwent randomization (71% were in the UK). 202 were in the surgical group and 196 in the medical group. At 6 months, death occurred in 27% of surgical patients and 48.9% of medical patients. 8.5% vs 2.1 % of surgical vs medical patients were in a vegetative state. When analyzed, favorable outcomes occurred in 42.8% of patients in the surgical group and 34.6% of medical patients. The authors concluded that for every 100 patients treated surgically, there were 22 more survivors, of these 22, 6 were vegetative, 8 have low severe disability, and 8 had upper severe disability or better.

Analysis: Early intervention (the DECRA trial) showed that patients undergoing craniectomy has worse ratings at 6 months than those undergoing medical care. However, this study suggests that decompressive craniectomy as a later intervention (after medical treatment has failed) have more survivors, with a survival advantage in both dependent and independent living. My conclusion: In the ED, we will continue to provide medical interventions to our patients with increased ICP. Previous studies showed that early treatment in the operating room was associated with worse outcomes. However, if the medical treatment is failing, it seems like the patients will do better if they go to the OR for a decompressive craniectomy.
