C.05

Anticoagulant prophylaxis against venous thromboembolism following severe traumatic brain injury: a prospective observational study and systematic review

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Background: Venous thromboembolism (VTE) is a serious complication following severe TBI, however, anticoagulant prophylaxis is often withheld over concerns of intracranial hemorrhage (ICH) progression. We analyzed practice patterns and outcomes among severe TBI patients and systematically reviewed the literature for studies of anticoagulant prophylaxis after severe TBI. **Methods:** We prospectively screened consecutive patients with severe TBI (highest GCS≤8 from time of injury to ICU admission) admitted to a Level-I trauma centre between Oct 1,2015–Sept 30,2016 to assess type/timing of anticoagulant prophylaxis, rates of new VTE and ICH progression. **Results:** We identified 64 eligible patients with severe TBI. Most (53;83%) received anticoagulant prophylaxis, initiated ≥3d after TBI in 67%. Ten (16%) developed VTE during hospitalization; 8 started prophylaxis prior to VTE. No significant difference was observed in VTE incidence or ICH progression between patients with early prophylaxis (<3d) vs.later (≥3d). Our systematic review identified 5 studies of heterogeneous quality/design, with reported VTE incidence of 11-30% in patients without anticoagulant prophylaxis and 5-10% in patients with prophylaxis. **Conclusions:** VTE is a common complication after severe TBI despite routine use of anticoagulant prophylaxis. Anticoagulant prophylaxis is often started late (≥3d) post-injury. The relative benefits of early prophylaxis versus possible risks of ICH progression should be directly compared in an appropriately powered RCT.

C.06

Somatotopic organization of the human spinothalamic tract: CT-guided mapping in awake patients undergoing cordotomy

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Background: After correlating in vivo macrostimulation-induced pain or temperature sensation during percutaneous cervical cordotomy with simultaneous CT imaging of the electrode tip location, we present a modern description of the somatotopy of the human cervical spinothalamic tract **Methods:** Twenty patients with medically refractory, unilateral, nociceptive pain due to malignancy received contralateral cervical percutaneous cordotomy. In a post-hoc analysis of the data, each individual's cervical spinal cord was measured from the CT image using PACS software. The location of the electrode tip during each stimulation-induced response was then superimposed on a diagram of their cord **Results:** The lower limb responses were found more superficial and posterior to those of the upper limb. Interestingly, the region for upper limb responses surrounded that for lower limb primarily anteriorly and medially (deep) but also posteriorly **Conclusions:** This work simultaneously combined awake physiologic localization of fibers within the human spinothalamic tract (STT) with neuroimaging documenting their precise anatomical localization within the spinal cord. The resultant map of the STT demonstrates, for the first time, that fibers from the lower limb are located superficially and posteriorly within the anterolateral spinal cord with the fibers from the upper limb surrounding them primarily deep and anteriorly but also posteriorly

C.07

Calgary shunt protocol, an adaptation of the hydrocephalus clinical research network shunt protocol reduces risk of shunt infection in children

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Background: The effectiveness of the Hydrocephalus Research Network (HCRN) shunt protocol has not been validated in a non-HCRN, small-to-medium volume pediatric neurosurgery center. This study evaluates whether the 9-step Calgary Shunt Protocol (CSP) adapted from the HCRN shunt protocol reduced shunt infections. **Methods:** The CSP was prospectively applied at Alberta Children's Hospital from May 23rd, 2013 to all children undergoing any shunt procedure. Children undergoing shunt surgery before CSP implementation acted as a control-cohort. The strict HCRN definition of shunt infection was applied. **Results:** A total of 268 shunt procedures were performed. There was a significant absolute risk reduction of 10.0% ([95%CI 3.9%-15.9%], p=0.004) in shunt infections after implementation of the CSP. In univariate analyses, chlorhexidine compared to povidone skin prep reduced shunt infection by 8.2% ([95%CI 1.84-14.6%], p=0.02) and waiting ≥ 20 min between receiving preoperative antibiotics and skin incision reduced shunt infections by 9.6% ([95%CI 2.4%-16.9%], p=0.02). In multivariate analysis, only protocol implementation independently reduced shunt infections (OR 0.19 [95%CI 0.06-0.67], p=0.004). **Conclusions:** This study externally validates the published HCRN protocol for reducing shunt infection in an independent, non-HCRN, and small-to-medium volume neurosurgery setting. Chlorhexidine skin prep and waiting ≥ 20 min between preoperative antibiotic and skin incision may have contributed to the protocol's quality improvement success.