F.5

CHange in Optic nerve sheath diameter and Optic disc elevation and risk of Shunt failure in the pediatric Emergency department (CHOOSE study)

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Background: Ocular point-of-care ultrasound (POCUS) may be a clinically useful method to evaluate shunt dysfunction for children with hydrocephalus in the emergency department (ED). We assessed whether a change in optic nerve sheath diameter (ONSD) from prior asymptomatic baseline is associated with shunt failure. Methods: This prospective single center cohort study included asymptomatic shunted children (age 0-18 years). Baseline ocular POCUS was performed in the outpatient neurosurgery clinic; a second POCUS was performed if the patient subsequently presented to the ED with symptoms of shunt failure. Shunt failure was defined by intraoperative confirmation of inadequate CSF flow through the shunt within 96 hours from ED presentation. Results: The primary outcome of intra-operatively confirmed shunt failure occurred in 14/76 (18%) ED patient presentations. ΔONSD in patients with and without shunt failure was 0.89mm and 0.16mm respectively; the mean difference was 0.73mm (95%CI: 0.34-1.12), p=0.0012. The area under the receiver operating characteristic curve was 0.86, with an optimal cutoff of ≥+0.4mm, corresponding to sensitivity of 0.93, specificity of 0.73, PPV of 0.43, NPV of 0.98. Conclusions: ΔONSD was strongly associated with shunt failure. We found ΔONSD of <+0.4 in symptomatic children with CSF shunts may identify a population that had low likelihood of true shunt failure.

F.6

Quality improvement in neurosurgery: the dramatic impact of the spine assessment clinic in reducing post-op emergency department visits

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Background: Our prior six-year review (n=2165) revealed 24% of patients undergoing posterior decompression surgeries (laminectomy or discectomy) sought emergency department (ED) care within three months post-surgery. We established an integrated Spine Assessment Clinic (SAC) to enhance patient outcomes and minimize unnecessary ED visits through pre-operative education, targeted QI interventions, and early post-operative follow-up. Methods: We reviewed 13 months of posterior decompression data (n=205) following SAC implementation. These patients received individualized, comprehensive pre-operative education and follow-up phone calls within 7 days post-surgery. ED visits within 90 days post-surgery were tracked using provincial databases and compared to our pre-SAC implementation data. Results: Out of 205 patients, 24 (11.6%) accounted for 34 ED visits within 90 days post-op, showing a significant reduction in ED visits from 24% to 11.6%, and decreased overall ED utilization from 42.1% to 16.6% (when accounting for multiple visits by the same patient). Early interventions including wound monitoring, outpatient bloodwork, and prescription adjustments for pain management, helped mitigate ED visits. Patient satisfaction surveys (n=62) indicated 92% were "highly satisfied" and 100% would recommend the SAC. Conclusions: The SAC reduced ED visits after posterior decompression surgery by over 50%, with pre-operative education, focused QI initiatives, and its individualized, proactive approach.

F.7

Chromosome 1p loss and 1q gain are highly prognostic and can inform WHO grading of meningioma

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Background: The WHO grade of meningioma was updated in 2021 to include homozygous deletions of *CDKN2A/B* and *TERT* promotor mutations. Previous work including the recent cIMPACT-NOW statement have discussed the potential value of including chromosomal copy number alterations to help refine the current grading system. Methods: Chromosomal copy number profiles were inferred from from 1964 meningiomas using DNA methylation. Regularized Cox regresssion was used to identify CNAs independenly associated with post-surgical and post-RT PFS. Outcomes were stratified by WHO grade and novel CNAs to assess their potential value in WHO critiera. Results: Patients with WHO grade 1 tumours and chromosome 1p loss had similar outcomes to those with WHO grade 2 tumours (median PFS 5.83 [95% CI 4.36-Inf] vs 4.48 [4.09-5.18] years). Those with chromosome 1p loss and 1q gain had similar outcomes to those with WHO grade 3 cases regardless of initial grade (median PFS 2.23 [1.28-Inf] years WHO grade 1, 1.90 [1.23-2.25] years WHO grade 2, compared to 2.27 [1.68-3.05] years in WHO grade 3 cases overall). Conclusions: We advocate for chromosome 1p loss being added as a criterion for a CNS WHO grade of 2 meningioma and addition of 1q gain as a criterion for a CNS WHO grade of 3.