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ABSTRACT SUBMISSION TITLE: *C4 - Trends in Open versus Minimally Invasive Craniosynostosis Repair: A 10-Year National Analysis*

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Abstract Text:

PURPOSE:

Techniques for cranial vault reconstruction for craniosynostosis have increasingly shifted towards minimally invasive methods. The present study sought to identify trends in surgical approaches based on demographics and surgical outcomes over the past decade.

METHODS:

The National Surgical Quality Improvement Program - Pediatrics was queried to identify patients with craniosynostosis who underwent cranial vault repair between January 2013 to December 2022. Patient demographics, surgical characteristics, and postoperative outcomes were gathered for both open surgery (OS) and minimally invasive surgery (MIS) group per year. Trend analysis was performed via linear regression and predictors for MIS were identified using univariable statistics and multivariable logistic regressions.

RESULTS:

Among 12,104 patients identified, OS rates decreased from 96% to 91%, while the use of MIS increased from 3% to 9% ($P < 0.001$). MIS patients were younger, primarily White, and had fewer comorbidities, overall complications, blood transfusions, shorter operative time, anesthesia duration, and length of stay ($P < 0.001$). From 2013-2022, the number of overall complications, operative time, and length of stay significantly decreased in the OS group, while the number of patients with comorbidities increased in the MIS group ($P < 0.001$). Importantly, access to MIS for Hispanic patients improved significantly ($P < 0.001$).

CONCLUSIONS:

The prevalence of MIS for craniosynostosis repair increased over a 10-year period. MIS patients benefit from reduced complication rates, operative time, anesthesia duration, and length of stay. As MIS becomes a more common treatment modality for craniosynostosis, access has expanded to include more complex and diverse patients, though opportunities for improvement still remain.