

anthropomorphic database, providing plastic and craniofacial surgeons with “normal” anatomic measurements to optimize aesthetic and reconstructive outcomes.

METHODS: Patients with head MRIs without craniofacial indication from 2008-2021 were included. Images were used to construct composite (template) images with diffeomorphic algorithms and Advanced Normalization Tools (ANTs). Algorithms were based on symmetric diffeomorphic image registration with image averaging. Composites were thresholded to generate binary segmentations used for anatomic measurements in Materialise Mimics.

RESULTS: High-resolution MRIs from 80 patients generated eight composites with ten MRI sequences each: four seven-year-olds and four eight-year-olds (two male, two female, two black, and two white). Head circumference of seven- and eight-year-old composites was 52.9cm and 53.9cm, respectively. The average lateral canthus to lateral canthus distance was 1.6mm longer in eight-year-old (90.7mm) than seven-year-old (88.1mm) composites. Nasion to nasal tip distance was 4.4mm longer in eight-year-old (31.4mm) than seven-year-old (26.9mm) composites.

CONCLUSION: Application of diffeomorphic algorithms via ANTs to MRI is effective in creating composite templates to represent “normal” craniofacial and soft tissue anatomy. Future research will focus on development of mathematical tools to characterize anatomic normality, generation of indices to grade preoperative severity, and quantification of postoperative results to reduce subjectivity bias.

P68. CASTING AN EYE ON FIBROUS DYSPLASIA OF THE ORBIT

Jessica D. Blum, MSc, Dillan F. Villavisanis, BA, Liana Cheung, MBBS, Jingtang Ng, MA, Daniel Y. Cho, MD, Jordan W. Swanson, MD, Jesse Taylor, MD, Scott P. Bartlett, MD

Children’s Hospital of Philadelphia, Philadelphia, PA, USA.

PURPOSE: The presence of orbital fibrous dysplasia (FD) threatens compressive neuropathy and irreversible vision loss. The purpose of this study is to evaluate the longitudinal outcomes of 35 patients with orbital FD who underwent stratified surgical management.

METHODS: All patients treated for FD from 2015-2021 were identified, yielding 186 patients. Thirty-five patients had orbital involvement and 24 had over one year of follow-up. Treatment course, operative records and head imaging were obtained from chart review.

RESULTS: Average patient age at FD diagnosis was 11.0 ± 4.7 (IQR 6.7) years with average follow up of 5.1±4.7 years. Nineteen of 35 patients (54.2%) underwent at least one surgery for FD, with two patients requiring up to four serial operations. Average age at initial operation was 5.9 ± 6.9 years. Time from diagnosis to optic canal decompression was 2.5±2.8 years. Sixteen patients (45.7%) underwent surgical pathway 2, and three patients underwent surgical pathway 3. Later diagnosis was associated with an increased total number of surgeries ($r=.674$, $p=.006$) and decreased time to decompression ($r=-.736$, $p<.001$). Postoperatively, three patients had worsening of vision (16.7%) and fifteen had stable or improved vision (83.3%).

CONCLUSION: Later diagnosis of orbital FD was associated with shorter time to orbital decompression and increased surgical burden. This study provides a preliminary description of treatment course and visual outcomes of orbital FD.

P69. TEN-YEAR INSTITUTIONAL EXPERIENCE TO PREDICT CALVARIAL BONE FLAP LOSS USING LONG-TERM OUTCOMES

Shannon S. Wu, BA¹, Brandon Specht, DO¹, Grzegorz J. Kwiecien, MD¹, Rachel E. Aliotta, MD², Brian Gastman, MD¹

¹Plastic Surgery, Cleveland, OH, USA,

²Plastic Surgery, Birmingham, AL, USA.

PURPOSE: Calvarial bone flap (CBF) loss is a common post-craniotomy complication associated with significant morbidities. Risk factors for CBF failure have not been well-defined. As CBF failure can occur many years following craniotomy, this study aims to determine risk factors of CBF loss using long-term follow-up data.

METHODS: This retrospective study included patients who underwent craniotomy with CBF reinsertion between 2003-2013 at a tertiary academic institution. Patients were included if demographics, risk factors, and