photographs and ImageJ were used to quantify palpebral fissure height and width, pupil-to-brow distance (PTB), and margin-reflex distance (MRD1) in pixels. The formula symmetry ratio = - [(1 - (s/n)) \times 100] was used to compare synostosed (s) and nonsynostosed (n) sides, where a symmetry ratio value of ‘0’ indicated perfect symmetry, and lower (more negative) symmetry ratio values indicated increased asymmetry. Positive differences in pre- and postoperative symmetry ratios indicate improved symmetry. The difference in canthal tilt angles was calculated with canthal tilt angle = |s - n|. Whitaker classification was assigned in a blinded fashion by two attending craniofacial surgeons. Statistical analysis was performed with unpaired t-tests.

**RESULTS:** Forty patients (ten males) were included. The average age at surgery for FOAR and DO groups was 9.4 vs. 6.5 months (p < 0.001) and average length of follow up was 6.0 vs. 5.1 years (p = 0.456), respectively. Photogrammetric analysis and unpaired t-tests demonstrated significantly improved postoperative symmetry in the DO cohort for palpebral width [FOAR: -2.24, DO: 3.07 (p = 0.020)], MRD1 [FOAR: -9.92, DO: 12.87, (p = 0.045)], and canthal tilt [FOAR: 0.97°, DO: 6.54°, (p = 0.010)]. Analysis did not reveal significant symmetry ratio improvement in palpebral height (p = 0.157) and PTB (p = 0.202) between DO and FOAR cohorts. Unpaired t-tests revealed no significant difference in Whitaker Classification scores between FOAR and DO cohorts, with average scores of 1.97 ± 0.56 and 1.78 ± 0.54, respectively (p = 0.394).

**CONCLUSION:** Photogrammetric analysis of the periorbital region in UCS patients five years after surgery reveals significant improvement in those treated with both FOAR and DO, with DO patients demonstrating superior results in palpebral width and canthal tilt symmetry. However, patients treated with DO achieved similar Whitaker Classification compared to their FOAR counterparts. It will be important to continue to follow these cohorts to craniofacial maturity prior to making any definitive conclusions.

**TRACK:** CRANIOMAXILLOFACIAL/HEAD AND NECK

**A Novel Angle to Reliably Diagnose Sagittal Craniosynostosis**

**Presenter:** Jessica D. Blum

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**PURPOSE:** Premature closure of the sagittal suture causes restricted growth perpendicular to the suture line and compensatory changes including temporal narrowing, frontal bossing, occipital bulleting, scaphocephalic head shape, and lowering of the vertex. This study assesses the ability of a novel photogrammetric diagnostic angle, largely based on cranial vertex position, to reliably distinguish sagittal craniosynostosis (SS) from control and false positive cases (SNS).

**MATERIALS AND METHODS:** All head CT imaging at our institution between 2014-2020 was reviewed for patients with sagittal synostosis (SS, n =177), presumed sagittal synostosis with normal imaging (n=30), and controls (n = 100). A novel measurement reflecting the anterior-posterior location of the vertex was measured by an angle drawn between the cranial vertex, nasion, and opisthocranon (VNO) in profile view with the head in a neutral position. This VNO angle was measured on 307 3D head CTs and 172 lateral clinical photos using NilRead Viewer and Microsoft PowerPoint respectively. Cranial index (CI) was measured on axial pre-operative head CTs. A threshold to determine maximum diagnostic sensitivity and specificity of the VNO angle was established based on receiver operating characteristic (ROC) curve analysis. Logistic regression was used to assess the ability of VNO angle to predict true SS diagnosis.

**RESULTS:** Mean age at pre-operative head CT was 9.5 months for the SS cohort, 4.2 months for the SNS cohort, and 8.9 months for controls (p=.327). Mean age at pre-operative clinical photo was 9.5 months for the SS cohort and 4.2 months for the SNS cohort (p=.149). The average VNO angle measured on clinical photos was 54.7° ±3.8° for the SS group, 43.1° ±2.2° for the SNS group, and 41.1° ±3.7° for controls (p<.001). Pearson correlations revealed no significant association between VNO angle and age at scan or age at clinical photo for any group (p = .232 - .924). Evaluation of standardized clinical photos revealed frontal bossing in 66% of SS patients (n = 104), 17% of SNS patients (n = 3), and zero controls. Occipital bulleting was present in 43% of SS patients (n = 83), 33% of SNS patients (n = 6), and zero controls. Receiver operating characteristic (ROC) analysis yielded a cut-off of ≥ 50° to identify SS. Diagnostic sensitivity and specificity were 96.6% and 99.2% respectively. Lastly, a logistic regression analysis to investigate the ability of a VNO angle ≥50° to predict a diagnosis of SS revealed a 95.3 times greater likelihood of having sagittal craniosynostosis (SS) from control and false positive cases (SNS).
synostosis with a VNO angle greater than or equal to 50° \([\text{Exp (B)} = .047]\). The unstandardized Beta weight for the predictor variable was \(B = 8.198, \text{S.E.} = 1.086, \text{Wald} = 56.938, p < .001\). ROC analyses including FB, OCB, and CI measurements were not as sensitive or specific as VNO angle alone.

CONCLUSION: Measurement of the VNO angle is a reliable screening tool to diagnose sagittal craniosynostosis, with an angle \(\geq 50^\circ\) strongly suggesting suture synostosis. This method relies on the relationship between the anterior displacement of the vertex and occipital bulleting to approach the diagnostic accuracy of CT imaging.

**TRACK: AESTHETIC**

**Fat Grafting Safe Practices in Dynamic Definition Liposculpture**

**Presenter: Alfredo E. Hoyos Ariza, MD**

**Co-Authors: Mauricio Perez**

**BACKGROUND:** The aesthetics standards for the male and female body fluctuate among different populations, hence Aesthetic Body Sculpting has to adjust accordingly to suit the patient preferences and expectations. One of the pillars in which Dynamic Definition Liposculpture (HD2) stands on is Fat Grafting, which nowadays include the concepts of power muscles and definition muscles. The latter are subject to demarcation and careful carving during surgery, while the former benefit as well from Fat Grafting in order to improve their volume and projection, and as a consequence, the anatomic, athletic, and youthful contour. We carried out a retrospective cohort including patients who underwent fat grafting of different muscles during HD2 including: The trapezius, the latsissimus dorsi, the erector spinae, the pectorals, the breasts, the rectus abdominis muscle, the gluteus medius, above the gluteus major (SQ), the deltoids, the biceps, the triceps, the vastus medialis/lateralis, the biceps femoris, and/or the calves.

**METHODS:** We performed cadaveric dissections for each anatomical region in order find the main pedicle for each muscle and as a result design a safe and reproducible fat grafting technique. Furthermore, we looked into our records for patients who underwent fat grafting in addition to HD2 from January 2017 to February 2022. Criteria for inclusion were any patient undergoing fat grafting of any/multiple muscles as part of HD2 procedures.

**RESULTS:** A total of 1192 patients consecutive patients met the inclusion criteria. About 1020 (85%) were women and 172 (15%) were men. Anatomic regions subject to fat grafting included the posterior torso (5%), the upper limbs (14%), the anterior torso (37%), the gluteal region (94%) and the lower limbs (10%). Adipose graft volumes ranged from 40 to 650 cc (Avg = 250 cc). Only three cases of cellulitis were reported (0.3%), they were treated with oral antibiotics and physical means. Hematoma was reported in 5 cases (0.4%), which solved with conservative measures. No other complications were reported related to fat grafting. Almost all patients were satisfied with the procedure (95%). Follow up period ranged from 2 to 48 months.

**CONCLUSION:** Liposuction might not be enough to achieve either the ideal musclelization of the male’s body or the voluptuous/slim figure of the female anatomy. In such cases, fat grafting has become the cornerstone to achieve the desired body contour. The proper recognition of the main neurovascular pedicle from each muscle subject to fat grafting, the accurate preoperative markings and a meticulous surgical technique ensure both the safety and the reproducibility of our techniques. The high satisfaction index and the low rate of complications support our findings and encourage future studies to broaden the targeted population with a multicenter approach. LEVEL OF EVIDENCE: IV. Type of Study: Therapeutic – Retrospective Cohort. KEYWORDS: Anatomic dissection; liposculpture; high definition; body contouring surgery; fat grafting; intramuscular lipoinjection; subcutaneous lipoinjection; multilayer lipoinjection.

**TRACK: CRANIOMAXILLOFACIAL/HEAD AND NECK**

**Relating Metopic Severity to Mid-term Aesthetic Outcomes: A Machine Learning Approach**

**Presenter: Jessica D. Blum**

**Co-Authors: Justin Beiriger, Dillan Villavisnis, Carrie Zimmerman, Daniel Y. Cho, MD, PhD, Scott Paul Bartlett, MD, Jesse A. Taylor, MD, Jesse Goldstein, MD, Jordan W. Swanson, MD, MSc**

**PURPOSE:** Aesthetic deterioration after surgical treatment of metopic craniosynostosis may manifest as bitemporal