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Long-Term Appearance and Outcomes after Strip Craniectomy Compared with Open Cranial Vault Reconstruction for Sagittal Craniosynostosis

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OBJECTIVES/GOALS: Strip craniectomy with orthotic helmet therapy (SCOT) and open cranial vault reconstruction (OCVR) are mainstay surgical treatments for sagittal craniosynostosis. The purpose of this study is to compare long-term morphologic outcomes of the skull, subjective appearance, and perioperative outcomes between patients who underwent SCOT and OCVR. METHODS/STUDY POPULATION: Patients who underwent SCOT or OCVR for isolated, non-syndromic sagittal craniosynostosis with preoperative computerized tomography (CT) imaging were identified at UCSF between 2000 and 2020. Perioperative outcomes were extracted from the medical chart. Anthropometric measurements will be used to assess baseline severity using preoperative CT imaging and postoperative skull morphology using 3D camera imaging. Patient satisfaction surveys will be administered to parents at the time of postoperative 3D imaging. Subjective appearance will be rated among adolescents and craniofacial surgeons using patients' postoperative 3D imaging. Descriptive statistics will be calculated using Student's t test and Mann-Whitney U. Chi-square tests and Fisher exact tests will be used to compare categorical outcomes. RESULTS/ANTICIPATED RESULTS: 47 patients were included in the study (18 SCOT and 29 OCVR) with similar follow-up between groups (SCOT 2.3 +/- 1.5, OCVR 2.6 +/- 2.0). There were no significant differences in sex or race. OCVR had longer operative times (p-value 0.0003), higher estimated blood loss (p DISCUSSION/SIGNIFICANCE: SCOT was associated with superior perioperative outcomes compared with OCVR due to its minimally invasive technique. Our results for long-term healing outcomes and subjective appearance may further guide craniofacial surgeons in selecting the most optimal operative technique.

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Machine learning identification of diabetic foot ulcer severity to reduce amputation risk

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OBJECTIVES/GOALS: Target: Computationally identify the markers of ulcer severity and risk of amputation from datasets that include demographics data, clinical, laboratory data, and medical history over 6000 patients. METHODS/STUDY POPULATION: In this study we will use tables of demographics such as age, gender, and ethnicity/race. Inspired by previous research we'll include wound age (duration in days), wound size, number of concurrent wounds of any etiology, evidence of bioburden/infection, Wagner grade, being non ambulatory, renal dialysis, renal transplant, peripheral vascular disease, and patient hospitalization. Another table will include laboratory vital signs to include physiological variables such as height, weight, body mass index, pulse rate, blood pressure, respiratory rate, and temperature. We'll include also social data like smoking status, socio-economic status, housing condition. RESULTS/ANTICIPATED RESULTS: Our project aligns with previous efforts to identify high risk Diabetic Foot Ulcer individuals but also takes a different perspective by collecting and marking clinical data from a subset of patients (e.g., severity, Hispanic versus non-Hispanic) and computationally process these data to provide a tool that can identify DFU severity and high-risk patients. We will obtain samples from Hispanics and non-Hispanics because these two groups are likely to have significant differences in the progression of ulcer severity. The rationale is that by comparing these two groups, we will assess and study the factors that are differentially present. It is our expectation that the proposed project will provide an easy-to-use tool for DFU progression and risk of amputation and contribute to identify high-risk individuals. DISCUSSION/SIGNIFICANCE: Diabetes prevalence estimates in Bexar County, TX exceeds national estimates (15.5% vs. 11.3%) and diagnosed cases are higher among Hispanic adults (13.4%) compared to their non-Hispanic white counterparts (9.5%). Late identification of severe foot ulcers minimizes the likelihood of reducing amputation risk.

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Machine learning to predict genetic variation and cardiovascular risk in Hispanic patients with Systemic lupus erythematosus

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OBJECTIVES/GOALS: Cardiovascular disease (CVD) is the most common cause of death in systemic lupus erythematosus (SLE). Genome-wide association studies have identified single nucleotide polymorphisms linked with CVD risk, but the association with SLE is not well established. We aimed to determine associations using machine learning in a multi-ethnic lupus cohort. METHODS/STUDY POPULATION: We will use data from the established SLE cohort study named Genetic Profile Predicting the Phenotype (PROFILE). PROFILE was constituted in 1998 by combining existing cohorts at multiple sites which are also of defined ethnicity (Hispanics of Mexican ancestry and Puerto Rico, African American, and Caucasian). The cohort consists of 3,118 individuals and the database contains socioeconomic–demographic, clinical, laboratory, and genetic variables. Genetic data consist of 196,524 single nucleotide polymorphisms. To detect risk genes and predict an individual's SLE risk will design a random forest classifier using SNP genotype data. Logistic regression models will be performed with CVD as the outcome, adjusted for age, sex, ethnicity, disease duration, and traditional and nontraditional risk factors for CVD. RESULTS/ANTICIPATED RESULTS: We expect to find several established and new susceptibility genes associated with CVD. DISCUSSION/SIGNIFICANCE: This approach offers an opportunity to characterize distinct genetic risk factors and the relationship of CVD with SLE. These data may be important in the identification of patients at high risk for such events and may allow the design of preventive strategies which may beneficially have an impact on the morbidity and mortality of SLE patients.

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