to determine if head scans alone are sufficient, or whether dedicated facial scans are required to identify fractures.

METHODS: All operative facial trauma over a 16 year period (1998 – 2013) at a single institution was reviewed. Patients were categorized based on the imaging modality (head or face scan) used to evaluate their facial fractures, excluding those receiving a single imaging study. Fracture patterns seen were categorized and patients receiving both scan types were grouped based on whether the results were identical. Demographic information was compared between the groups. Further analysis was performed for the group with non-identical results to determine the difference in the type and quantity of fractures captured by each scan.

RESULTS: A total of 307 patients were identified who underwent operative repair of traumatic facial fractures and received both face and head CT scans. 106 patients (35%) had findings which differed between the scans, while 201 patients (65%) had identical findings in each scan. No difference between the groups was observed with respect to age, length of hospital stay, gender, or insurance status. No difference was observed with most mechanisms of injury, except motorcycle accidents. For the 106 patients with differing results between the scans, the facial CT scans identified a clinically and statistically significant 40.6% more nasal fractures, 33% more midface fractures, 28.3% more zygoma fractures, 4.7% more frontal sinus fractures and 36.8% more orbital fractures—all of which were operative and would have been missed by standard head CT scan. In aggregate, a total of 151 fractures would have been missed in these patients by head scan alone.

CONCLUSION: A significant number of operative facial fractures were identified on dedicated facial imaging, when compared to standard head CT scan in about one third of patients. Dedicated facial CT scans should be strongly considered for patients with a suspicion for facial trauma by history and physical exam.

A Microplate Fixation for Treatment of Comminuted Mandibular Fractures

Presenter: Tae Joon Choi, MD
CONCLUSION: We could achieve complete bone healing and premorbid occlusion using microplates. The microplates are strong enough to keep comminuted mandibular fractures reduced. Their small size and malleability allow multiple fixation of comminuted bony segments in accurate-anatomical position, less periosteal stripping and self-occlusal adjustment. Therefore, microplate fixation may be one of good options for reconstruction of comminuted mandibular fractures.

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Reconstruction of Secondary Calvarial Defects with Ex-Situ Split Calvarial Bone Grafts

Presenter: Russell S. Frautschi, BS
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INTRODUCTION: Reconstruction of secondary calvarial defects continues to represent a challenge, amid unresolved debates regarding the optimal material and technique. Autologous reconstruction presents the advantages of biocompatibility, biointegration, and growth potential at the expense of donor site morbidity and possible resorption. Therefore, we investigated the outcomes of skull reconstruction with split calvarial bone graft (SCBG) over a 35-year period, analyzing risk factors for poor outcomes and changes in graft thickness.

METHODS: A retrospective chart review of patients who underwent cranioplasty with SCBG superior to the supraorbital margin between 1982 and 2016 was performed. Complications were divided into minor and major, with major requiring reoperation. Changes in graft thickness were analyzed using follow-up CT and MRI scans; bone thickness contralateral to the donor site was used as a reference point to approximate the initial donor bone thickness and served as the denominator to calculate all ratios.

RESULTS: Forty patients with an average age of 33.2 years, cranial defect size 68cm², mean follow-up of 27.6 months were included. The majority of patients (85%) had significant comorbidities or risk factors; 43% experienced infection of a bone flap or alloplastic material prior to SCBG, and 68% of patients underwent an average of 2.2 prior skull reconstruction procedures. Minor or major complications occurred in 37.5% of the cases, with 27.5% experiencing a major complication requiring a second operation to treat most commonly resorption (4/11; 36%), irregularities (3/11; 27%), or infection (2/11; 18%). Patients with ≥1 comorbidity (OR=2.12; p=0.04) or a smoking history (OR=6; p=0.02) were more likely to experience a complication. Prior infection did not increase the likelihood of complication (p=0.80). Mean radiographic follow-up was 11.9±10.9 years. Within the first year after SCBG, the mean ratio of the recipient-graft to the original donor bone thickness was 0.47±0.11 and 0.52±0.04 for the donor site. These ratios remained stable throughout the follow-up period at 0.48±0.17 and 0.57±0.10, respectively (p>0.05).

CONCLUSION: Skull reconstruction with SCBG in the setting of significant comorbidities and risk factors yields a high first-attempt success rate (72.5%), with good longevity, biocompatibility, and biointegration. All cases of major resorption occurred early, while the long-term follow-up of SCBG thickness demonstrates permanence with no significant remodeling altering graft thickness.

Reduction Cranioplasty Using Virtual Surgical Planning for Hydrocephalic Macrocephaly

Presenter: Sarah A. Frommer, MD, PhD