Background: Partial face composite allotransplantation poses a unique aesthetic challenge. Namely, partial face transplants need to resemble the patient's native skin. The degree of resemblance considered acceptable is a prominent variable and may depend on the gender and underlying skin tone of the recipient. The primary aim of this study was to investigate the degree of skin tone matching deemed aesthetically tolerable, recipient gender, and recipient skin tone. Two populations were queried: (1) the general public and (2) plastic surgeons. Few studies have investigated this topic from either of these standpoints. A secondary aim was to determine whether participant characteristics such as demographics, skin color, and history of having had facial surgery impacted their perceptions.

Methods: This was a cross-sectional investigation of perceptions on skin tone matching. Participants from the general public were recruited through Amazon Mechanical Turk and surgeons were recruited through the American Council of Academic Plastic Surgeons. Participants were queried for aesthetic preferences using frontal face photos from age-standardized models. Skin tones of transplanted segments were varied using the Munsell color scale via Adobe Photoshop (Adobe Inc., San Jose, CA).

Results: In total, 550 lay participants from Amazon Mechanical Turk and 21 plastic surgeons provided complete survey responses. On average, plastic surgeons tolerated a lesser degree of skin tone discordance than the lay public: 87% of lay participants and 33% of plastic surgeons believed a change of 4 hues was acceptable ($p=0.02$). Additionally, all survey respondents tolerated less of a degree of skin tone discrepancy on female faces when compared to male faces (mean difference tolerated: 2 hues for females, 4 hues for males). Participants tended to tolerate less skin tone discrepancy in subjects with similar skin tones as their own (mean difference tolerated: 2 hues for own versus 4 hues for different skin tones, $p=0.04$).

Conclusion: This study highlighted the intensely- subjective nature of aesthetic preferences surrounding skin tone matching on the face, which varied by demographics and between surgeons versus the lay public. Surgeons should ensure that they truly elicit their patients' preferences, especially given that our results demonstrated a greater tolerance for discrepancies among the lay public compared to plastic surgeons. Procuring a graft for facial allotransplantation is challenging; understanding what level of skin tone discrepancy is tolerable to the recipient can help surgeons improve patient satisfaction and may also lessen time-to-transplant by enlarging the potential donor pool for this type of transplant.

QS4

Optimizing The Decellularization Of The Rodent Epigastric Free Flap: A Comparison Of Automated SDS-based Protocols

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Purpose: Raising flaps to cover complex wounds with exposed critical structures are lengthy operations that result in donor site morbidity. Tissue engineering research is developing with great promise to build replacement tissues without morbidity. Decellularization removes whole cells and cell debris, and is the initial step to create a scaffold with an intact vascular network. Benchmark measurement of the overall cellular level is quantification of the DNA content, where 50 ng/mg is classically considered as a threshold. Although perfusion decellularization and recellularization approaches have shown exceptional promise in whole organ engineering, there is minimal crossover into the microsurgical field. Sodium dodecyl sulfate (SDS)-based protocols are known to have deleterious effects on the ultrastructure and capillary network of the scaffolds, but remain the predominant choice for decellularization protocols. This study aims to optimize the SDS exposure protocol for automated decellularization by comparing different SDS perfusion times to gain better understanding of the balance between decellularization and scaffold preservation.

Methods: A 3D-printed closed-system bioreactor capable of continuously perfusing fluid throughout the vasculature was used for decellularization of free flaps. 2x2 cm fasciocutaneous free flaps from the epigastric region of the rat were harvested, and the vascular pedicle was isolated as a single

artery and vein. Three flaps were evaluated in each group. The artery (inflow) and vein (outflow) were cannulated to monitor preservation of the vasculature. 1% SDS solution was perfused in different durations (3, 5 and 10 days) based on several protocols found in the literature. Automated SDS perfusion was followed by 1 day of 1% Triton X-100 and 1 day of 1xPhosphate-buffered saline (PBS), all of which were at the perfusion pressure of 120 mmHg.

Results: For vasculature analysis, continual perfusion into the artery and out of the vein within the bioreactor was assessed throughout the decellularization process. H&E, Masson's trichrome, and Verhoeff-Van Gieson staining were performed to assess architecture and locale of residual nuclei. Residual DNA was quantified by the fluorescent marker PicoGreen. 5 days of 1% SDS solution had the least residual DNA content (1.309±0.807 ng/mg) followed by 10 days (12.684±14.184 ng/mg) and 3 days (82.387±71.595 ng/mg), $p<0.001$. The DNA content ratio of skin over subcutaneous tissues was consistent across all protocols with skin having twice as much residual DNA after each protocol. The vascular network was visualized for qualitative assessment with the perfusion of hardening cast to create contrast against soft tissue to visualize with microCT imaging.

Conclusion: A decellularization protocol of 5 days of 1% SDS solution followed by 1 day of 1% Triton X-100 and 1 day of 1xPBS was the most successful to keep the residual DNA content at a minimum, while preserving the structural integrity of the tissues. The bioreactor is capable of running automated and repeatable protocols using several solutions and continuously perfusing fluid throughout the vasculature of a free flap. This compact and integrated system can decrease hands-on time and be used in the future for further recellularization of scaffolds to bioengineer soft tissue replacement without donor site morbidity.

QS6

Venous Thromboembolism After Deep Inferior Epigastric Perforator Flap Breast Reconstruction: Review Of Outcomes After A Postoperative Prophylaxis Protocol

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Purpose: Although breast cancer patients undergoing microsurgical breast reconstruction represent a relatively high risk group for venous thromboembolism events, there has been no standardized postoperative prophylactic regimen described to address this problem. An ideal dose of effective antithrombotic therapy that reduces the risk of VTE, while minimizing the cumulative risk of bleeding with on board antiplatelet therapy, is yet to be established. This study is a single-institution review on the rates of VTE following implementation of a postoperative VTE prophylaxis regimen.

Methods: A new chemoprophylaxis protocol was introduced starting March 2019 that involved two-weeks of treatment with enoxaparin, regardless of patient risk factors. A retrospective chart review was conducted on all patients who underwent DIEP flap breast reconstruction at our institution between January 2014 and March 2020. Patients were grouped based on whether they enrolled in new VTE protocol in the postoperative period or not. Patient demographics, prophylaxis type and outcomes data were recorded, retrospectively. The primary outcome measure was postoperative VTE incidence. Categorical variables were analyzed with a Chi-Square Test and continuous variables by Student's t-test.

Results: A total of 265 patients underwent DIEP flap breast reconstruction between January 2014 and March 2020, of which, 63 (23.8%) patients were discharged with VTE prophylaxis and 202 (76%) patients were discharged without. Patient characteristics were found to be similar between patients before and after the protocol. A total of 9 (3.4%) VTE events were identified, all of which were in the group prior to the protocol.

Conclusion: This retrospective study demonstrates successful implementation of a two-week chemoprophylaxis regimen for patients undergoing DIEP flap breast reconstruction. Additional analysis of patient characteristics with VTE at our institution can lead to establishment of a local protocol, with individually tailored prophylaxis regimens. This can further be improved by prospective risk assessment and inclusion of Caprini Score and patient anti-Xa levels in our institution's DIEP flap database.