both across the three processing techniques and among the sample components (ie, ASCs, SVF or fat). There were similar concentrations of adipogenic markers among all three grafts with minimal concentrations in the ASCs or SVF. Angiogenin, CD31 and vascular endothelial growth factor (VEGF) were used as markers of vasculogenesis. CD31 expression was similar among all samples. VEGF and angiogenin values were higher in the graft samples processed with the AF system compared to PF or centrifugation. Markers of inflammation had the greatest variability. For example, C-reactive protein (CRP) was not expressed in the pure ASC samples but similarly found in the SVF and grafts across all three techniques. Conversely, IL-8 was minimal in the grafts, and comparable in the SVF and ASC samples. CD14 concentration was negligible in the pure ASC populations, and comparable in the SVF and grafts processed by active or passive filtration; however, there was nearly two-fold higher concentration in the graft processed by centrifugation compared to PF or centrifugation. Markers important in tissue regeneration, hepatocyte growth factor (HGF), fibroblast growth factor (FGF) and matrix metalloproteinase 9 (MMP9), were similarly variable. FGF was comparable among all samples and all techniques. HGF was similar in the SVF and grafts resulting from filtration devices (AF and PF) but negligible in the SVF and grafts from centrifugation. MMP9 was highest in the SVF from all processing techniques compared to ASCs and fat.

Conclusions: This study compares secretomes of the adipose tissue grafts, SVF and ASCs resulting from three different processing techniques. While there were many similarities, there are differences in cytokine expression both in the graft and the associated SVF, particularly in inflammation and wound healing. These secretomes may impact graft retention and fat necrosis in the clinical setting or have implications in cell-assisted lipotransfer. Outcomes studies are underway to correlate these findings.

QS27

Vitamin D3 (calcitriol) Improves Autologous Fat Graft Retention In A Murine Model

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Introduction: Autologous fat grafting is an important technique in plastic surgery that is currently limited by unpredictable or unsatisfactory outcomes. After injection, adipose grafts experience hypoxia-induced necrosis, inflammation, macrophage-resorption and finally, repopulation by circulating cells. We hypothesize that reducing phagocytic clearance of the residual graft scaffold will increase overall retention following revascularization. Calcitriol, the active form of Vitamin D3, decreases inflammation and promotes adipogenesis, therefore we compared fat grafting with local and systemic calcitriol to control fat grafting outcomes in an animal model.

Methods: Coleman processed lipoaspirate from 3 unique donors was implanted bilaterally on the mouse dorsum and graft retention and viability were assessed at 1, 4, and 12 weeks. Calcitriol was either delivered systemically by thrice weekly calcitriol IP injections or locally by introducing calcitriol into the lipoaspirate container for 1 hour. To determine mechanism of action, in vitro experiments were performed with adipose particles suspended in media with calcitriol in 1% hypoxic culture and tissue viability and gene expression were measured.

Results: At 1 and 4 weeks, both local and systemic administration of calcitriol increased graft retention (p<0.05). At 12 weeks, systemic calcitriol increased retention from 54.6% to 79.8% (p<0.05) while local delivery was not significantly different from the control. At every study time point, there was no significant difference in the H&E based injury score between groups, however perilipin IHC showed adipocyte viability was increased at 12 weeks from 48.7% to 63.3% (local p>0.05) and from 48.3 to 70.7% (systemic, p<0.05). In vitro, calcitriol decreased the expression of inflammatory...
cytokines corresponding to phagocytic activity and M1 activity (SOD1, IFNγ, IL6) and increased expression of apoptosis genes (BNIP3). Surprisingly, our results suggested that Calcitriol obviated necrosis-related inflammation through induction of apoptosis, resulting in decreased inflammation, decreased fibrosis and improved tissue regeneration.

**Conclusion:** Calcitriol, an FDA-approved drug with known immunomodulatory properties, appears to be a promising drug for improving long term fat grafting outcomes. Calcitriol demonstrated the ability to increase fat graft retention up to 12 weeks in mice and exhibited anti-inflammatory properties in vitro. Calcitriol has potential as a simple, economical means of increasing fat graft retention.

**QS28**

**Unnecessary Interfacility Transfers For Craniomaxillofacial Trauma**

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**Purpose:** Patients with CMF injuries are frequently transferred for specialist evaluation. Although transfer guidelines have improved outcomes for trauma care, no standards exist for CMF injuries. As a result, many patients are unnecessarily transferred emergently between facilities, resulting in high costs to patients and the healthcare system. This study assesses the regional frequency and necessity of transfers for isolated CMF injury.

**Methods:** A retrospective review was conducted of all transfers with a diagnosis of ‘facial trauma’ from 2013-2018. Using a previously validated framework, emergency interfacility transfers were deemed either necessary or unnecessary.

**Results:** A total of 368 transfers were identified with isolated CMF injuries. Only 27% of transfers required admission. Half of transfers were unnecessary, none of which required intervention by the facial trauma service. Of 49.5% of necessary transfers, 38% required admission for surgery or management of symptoms related to facial injury, 62% were discharged from the ED and three patients required emergency surgery.

**Conclusion:** Isolated CMF trauma rarely requires emergency surgery; however, transferred patients occasionally require urgent and elective procedures. Unnecessary transfers result in substantial expense to the patient and the healthcare system, and patients ultimately experience a delay in definitive care. Unnecessary patient evaluation diverts emergency staff and resources; increasing wait times and morbidity for other patients. This study demonstrates an opportunity for transfer guidelines to improve interfacility triage of patients with facial injury.

**QS29**

**The Damage Associated Molecular Pattern HMGB1 Limits The Formation Of Heterotopic Ossification In A Mouse Model**

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**Purpose:** Heterotopic ossification (HO) is the pathological extra-skeletal or ectopic formation of lamellar bone in non-osseous tissues. The treatment of HO often requires large soft tissue resections with reconstruction via local tissue rearrangement or free flaps. Additionally, burn wounds have been found to develop HO- a severely debilitating complication. In this study, we generated a model of HO in mice by injection of rhBMP-2 subcutaneously, with an attempt to alter the process of HO development via modulation of inflammation using local treatment with HMGB1, a damage associated molecular pattern (DAMP). As the nonsurgical mitigation or reversal of HO has appreciable clinical implications, we hoped to discover a novel local strategy for potential treatment of this disease process using HMGB1.

**Methods:** Twenty mice were used in the study. All animals were injected subcutaneously in the abdomen with 1 µg of rhBMP2 impregnated in 300 µL of growth factor-reduced Matrigel as a model for the induction of heterotopic bone formation. All animals were maintained without additional treatment for four weeks for the development of heterotopic bone. At the end of four weeks, all animals underwent whole-body micro computed tomography (micro-CT) imaging for the evaluation of heterotopic bone formation at the injection site. Sixteen of the initial twenty mice had radiological