preservation time. Safe prolongation of ischemia time will benefit multiple surgical procedures, e.g. multi-trauma surgery or VCA transplantation. Although currently available results on ECP of free flaps and extremities are promising, long-term perfusion of free muscle flaps is scarcely examined. The aim of this research was to evaluate long-term ECP and replantation of free rectus abdominis flaps and compare results to short static cold storage (CS).

MATERIALS AND METHODS: Unilateral free rectus abdominis flaps were harvested from 14 female Dutch landrace pigs (weight 63-84kg), followed by a 150cc passive flush of heparin-saline solution. Flaps were preserved in accordance to one of the following groups: 1) cold storage at 4°C for 4hr (n=4), 2) 18hr oxygenated continuous midthermic perfusion with Histidine-Tryptophan-Ketoglutarate (HTK) solution (n=5) or 3) 18hr oxygenated continuous midthermic perfusion with University of Wisconsin (UW) solution (n=5). After preservation, flaps were replanted to their original vascular pedicle and observed for 12 hours.

RESULTS: A total of 14 flaps was included in this study. The mean off-pedicle period in the CS-group was 5.4hr, compared to 19.2 and 19.1hr in UW resp. HTK-perfusion groups. Twelve flaps had uneventful post-replantation microsurgical controls and showed complete and homogenous perfusion on ICG-fluorescence angiography. One flap had acute arterial failure at 11.8hr post-replantation (UW-group) and one flap at 8hr post-replantation (HTK-group). A successful salvage procedure was performed for the latter after which controls and ICG-angiography patterns turned normal again.

Mean creatinine-kinase increase was higher in perfused groups (UW 48,571 U/L, HTK 32,014 U/L) compared to CS (9,494 U/L). However, mean venous lactate was lowest in UW-perfused flaps (0.68mmol/L), compared to CS-flaps (0.81mmol/L) and HTK-perfused flaps (0.86mmol/L). Mean weight increase was highest in HTK-flaps (114gr; 39%), followed by UW-flaps (72gr; 24%) and CS-flaps (50gr; 17%). Systemic cytokine levels (IL-1, IL-6 and TNF-) and histological evaluation (H&E, TUNEL) and qRT-PCR on muscle biopsies are currently under evaluation.

CONCLUSION: All flaps were successfully perfused for 18 hours. Although CK increase was higher in the perfused flaps, post-replantation microsurgical controls and perfusion patterns were normal in all but two flaps. Lactate levels and weight increase were lower in UW-perfused flaps compared to HTK-perfused flaps. Upcoming results will give more insight into underlying cellular processes and flap survival rate. Overall, extracorporeal perfusion might be a promising solution for free flap preservation, with a more than four-fold lengthening of maximum ischemia time. The extra time will benefit multiple surgical fields, for instance vascularised composite allograft transplantation or multi-trauma surgery.

The Use of Integra Flowable Matrix as a Soft Tissue Filler

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BACKGROUND: The search for an effective, biocompatible, and nonimmunogenic filler for soft tissue loss has been an ongoing effort. Integra Flowable Matrix has been demonstrated to improve wound healing in irregular-shaped wound beds and tunneling wounds. However, it has not been investigated for potential as a long-term filler. The matrix is a gel-like mixture of collagen and chondroitin sulphate matrix, which may lead to better volumetric and cellular infiltration than traditional fillers. This study’s aim was therefore to assess volume retention over time, cellular infiltration into the matrix, and immunogenic properties of the material in a small animal model.

METHODS: This study included a total of 40 SKH1-elite, hairless mice. All mice underwent injection of 1mL of Integra Flowable Matrix in the subdermal region of the scalp. Micro-CT was performed on 10 randomly selected mice at time 0, 2 weeks, and 8 weeks. CTs were 3D reconstructed and volume assessed of the implanted graft. 20 mice were euthanized at 2 weeks and 20 at 8 weeks. Volume of the grafts were assessed at this point using volume displacement. Grafts also went histological analysis with hematoxylin-eosin staining and immunohistochemistry to assess cell type infiltration into the matrix. Electron microscopy was also performed to assess cellular infiltration on a microscopic level into the material.

RESULTS: Integra Flowable Matrix was tolerated well by all mice as a filler. Average volume retention, measured by volume displacement, was 72.9% at 2 weeks and 47.9% at 8 weeks. This correlated well with volume measured...
by micro-CT analysis of 10 randomly selected mice. Vasculature entering the matrix was observed macroscopically at both 2 weeks and 8 weeks. Electron microscopy demonstrated cellular infiltration into the matrix as well as encapsulation of the material. Immunohistochemistry showed infiltration of fibroblast cells as well as increased vascularization in the matrix without evidence of immunogenic cell infiltration of T cells or macrophages.

DISCUSSION: This study demonstrates the potential to use Integra Flowable Matrix as a soft tissue filler for reconstructive patients or aesthetic patients requiring soft tissue volume. Volume retention over time was comparable to current soft tissue fillers on the market, and higher than autologous fat grafting. Electron microscopy and immunohistochemistry data demonstrate vascularization of the matrix and infiltration of fibroblasts and mesenchymal stem cells. Future research combining Flowable Matrix with autologous stem cells and adipose cells may also be promising.

**Meta-Analyses in Plastic Surgery: Can We Trust Their Results?**

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**PURPOSE:** The objectives of this manuscript is to assess the overall quality of meta-analyses in plastic surgery from 2007–2017, assess whether there has been an improvement in quality over time, and evaluate variables that may be associated with scientific quality.

**METHODS:** A systematic review of meta-analyses was undertaken using a computerized search of Medline, Embase, Cochrane Database for Systematic Reviews. Articles from seven plastic surgery journals published between the years 2007 to 2017 were included. Publication descriptors (author, year, country of publication), methodological and statistical methods were extracted. Each article was then assessed using the A Measurement Tool to Assess Systematic Reviews (AMSTAR) instrument.

**RESULTS:** A total of 67 studies were included. The number of meta-analyses increased consistently between 2007 and 2017 with the majority of studies coming from the United States. Most studies were outcome based, assessing a single intervention, from the journal Plastic & Reconstructive Surgery, pooled a mean of 21 primary studies (range: 2–134), and utilized a mean of 2465 patients (range: 44-14884). Most meta-analyses analyzed primary studies in the middle tiers of evidence levels (II to IV), with a small percentage analyzing randomized controlled trials (16.4%). Random effect modeling was most commonly used (47.8%) and meta-analyses generally had positive (82.1%) and significant results (74.6%). Meta-analyses evaluated clinical (80.6%), methodological (65.6%), and statistical heterogeneity (50.7%) variably in terms of appropriateness and a substantial portion did not acknowledge or report methodological (7.5%) and statistical heterogeneity (25.4%). AMSTAR scores ranged between two and ten, with a mean of 6.7 out of 11. AMSTAR scores were correlated with year of publication ($p=0.04, R=0.25$). Multivariable linear analysis indicated that more recent studies, studies that included a rationale for statistical pooling, and studies that properly managed methodological heterogeneity were correlated with higher AMSTAR scores ($r=0.66, p<0.01$).

**CONCLUSION:** The quality and number of meta-analyses have increased; however, despite an improvement in quality, the overall quality of most meta-analyses remains low. Meta-analyses should utilize proper data pooling methods and account for clinical heterogeneity appropriately. Readers, authors, reviewers, and journal editors should utilize validated instruments to evaluate meta-analysis to uphold methodological integrity.

**AESTHETIC SESSION 3**

**Post-Operative Intravenous Iron Sucrose Versus Post-Operative Oral Iron to Treat Post-Bariatric Abdominoplasty Anaemia (ISAPA): A Prospective, Open-Label, Randomised Controlled Trial**

**Presenter:** Juan Carlos Montano-Pedroso, MD, PhD  
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