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**Efficacy and Outcomes of Fat Grafting Beyond the Breast: A Meta Analysis**

*Presenter: Justin S. Buro, BS*

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**INTRODUCTION:** As autologous fat transfer (AFT) has become almost ubiquitous in the operating rooms of most aesthetic and reconstructive surgeons, the regenerative nature of grafted adipose tissue is fueling investigations into further applications beyond the usage in the setting of breast reconstruction. Empiric observation has demonstrated that grafted fat may ameliorate adherent scars, aide in the release of contractures, and even accelerate and improve wound healing in radiation damaged skin. As we are only beginning to understand the potential of lipotransfer, it is essential that we properly evaluate our progress. In the setting of its widespread and expanding use, the purpose of our study is to conduct a meta-analysis of “non-breast” fat grafting to elucidate the current measures of success, both from the patient and physician perspective.

**METHODS:** A PubMed/MEDLINE, Web of Science, and Embase search was conducted for all publications from January 1st, 2000 to October 1st, 2017 containing the phrase “autologous fat grafting” and related terms. The initial search yielded a total of 2255. Studies pertaining to AFT other than in the setting of breast reconstruction were individually selected to review. A review of this literature revealed significant heterogeneity of results. Of these studies, only 28 reported quantitative comparative data beyond observational or individual outcomes. No single measure of outcomes could be identified to reliably correlate the results of the various applications, so none were chosen for statistical analysis.

**RESULTS:** A thorough review of the literature demonstrated significant inconsistency in the reporting of measurable outcomes after AFT. Of the publications which presented quantifiable data, similar applications had consistently differing measurements of the same outcome. For example, in the treatment of vocal cord paralysis, one study utilized the Grade, Roughness, Breathiness, Asthenia, Strain (GRBA) perceptual scale, maximum phonation time (MPT), and Voice Handicap Index (VHI) whereas another described phonation time, jitter, and harmonic-to-noise ratio. In the treatment of neuropathic pain, two studies utilized the Visual Analog Scale (VAS) and Neuropathic Pain Symptom Inventory (NPSI) scales, but a third just simply described the pain or lack thereof. Lastly, in the treatment of scars, one study utilized the Vancouver Scar Scale while another was evaluated using the Patient and Observer Scar Assessment Scale. While these measures are similar in nature, a statistical analysis was impractical unless the raw data could be collected.

**CONCLUSION:** While the aggregate data demonstrates that fat grafting has led to positive outcomes in a multitude of applications beyond breast reconstruction, this meta-analysis serves to underline the growing necessity of a validated measure of outcomes of fat grafting in these disparate settings in order to ensure we continue practicing evidence based medicine.

**Free-Flap Outcomes and Screening Options in Factor V Leiden: A Systematic Literature Review**

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INTRODUCTION: Factor V Leiden is the most common form of inherited thrombophilic syndrome, affecting five per cent of Caucasian people. Patients who are homozygous have an 80-fold relative risk of developing abnormal blood clots. Patients who are heterozygous, which is much more common, have a relative risk of three to eight. While increased rates of venous thromboembolic complications have been regularly reported in factor V Leiden patients, little is known regarding their relative risk of microvascular complications or flap failure in free-flap surgery. The primary aim of this study was to evaluate the statistical and clinical significance of data in the extant literature on this subject.

METHODS: Our study has three parts. First, we conducted a systematic (PRISMA) review on outcomes in factor V Leiden patients who had undergone free-flap surgery. Second, we assessed the current state of the literature on the pathophysiology of microvascular or intra-anastomotic thrombosis in patients with factor V Leiden. Third, we evaluated potential screening strategies for this patient population.

RESULTS: Only nine studies, with a total of 22 patients and 24 free-flaps, fit the inclusion criteria for our systematic literature review. The extant literature suggests a trend towards increased flap failure rates in factor V Leiden patients, even in those who are heterozygous. However, the majority of studies were case series and therefore at high risk of publication bias. Moreover, the total number of patients was too small to be of statistical or clinical significance.

Literature on the pathophysiology of microvascular, as opposed to macrovascular, thrombosis in this patient population was found to be similarly scant. Various opinions exist regarding the role and the extent of pre-operative screening strategies for thrombophilias prior to free-flap surgery. However, specific screening protocols are yet to be evaluated for their impact on surgical outcomes, cost and quality of life.

CONCLUSION: The current state of the literature on outcomes for free-flap reconstruction in factor V Leiden patients is inconclusive. Larger scale case-control studies are recommended. Knowledge on the pathophysiology of microvascular thrombosis in thrombophilic patients is also lacking. Given the significant economic and psychological costs associated with failed free-flap reconstructions, we advocate the use of a non-invasive screening protocol that involves preoperative collaboration with hematologists for theoretically at-risk patient populations.

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A Retrospective Comparison of Two Techniques of Fat Grafting in Breast Reconstruction: Outcomes over 5 Years

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BACKGROUND: Autologous fat grafting (AFG) has become a common method of contour modulation of breasts after post-mastectomy implant reconstruction since the lift of the ASPS ban in 2009. Standard methods involve multiple tedious steps: harvesting, collection (with various possible manipulations) and finally reinfusion to the recipient site, most frequently via manual syringe. We developed a novel technique condensing these steps into one closed-loop system. In this innovative method we used a continuous flow pump to reinfuse fat to the breast. Del Vecchio also recently showed safety and efficiency with this method.

METHODS: We conducted a retrospective cohort review of patients receiving AFG for breast contouring either by the syringe or closed-loop method by a single surgeon. Time to infuse fat, complications, and outcomes were analyzed. The cohort included 19 syringe AFG procedures (34 breasts) and 25 closed-loop procedures (41 breasts) between 2013 and 2018. Both short term (infection, explant) and long-term complications (granulomas, cysts, biopsy) were analyzed.

RESULTS: Average infusion time was 15 minutes (4–30) for the closed-loop technique. Clinical follow-up times ranged from 28 to 161 weeks (mean=88) for syringe and 0 to 130 weeks (mean=32) for the closed-loop method. There were 2 major and 6 minor complications out of 34 breasts (5.5%, 16.6%, overall 23.5%) versus 1 major and 5 minor complications out of 41 breasts (2.4%, 12.1%, overall 14.6%) [p-value major=0.49, minor=0.58, overall=0.33]. Syringe