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BACKGROUND: Autologous fat grafting (AFG) is increasing in popularity to address a variety of defects. As the number of cases each year increases, there is interest in developing techniques to harvest, process and inject fat, which should improve clinical outcomes as well as operative efficiency. The purpose of this study is to compare the rate of graft processing of three commonly used systems for graft preparation.

METHODS: We conducted a prospective, randomized comparison of three methods to prepare adipose tissue for AFG: a passive washing and filtration system (Cytori PureGraft™, system–PF), an active washing and filtration system (Revolve™, system–AF) or centrifugation without filtration (Coleman technique, C). Processing technique was randomized by patient and stratified by four surgeons participating in the study. A trained, independent observer recorded the details of each procedure according to a behavioral checklist for the study. The primary outcome measure was rate of adipose tissue processed, defined as milliliters per minute. Secondary outcomes included total fat grafting time and total operative time. Additionally, the percentage of “graftable” fat, defined as the ratio of the volume of graft after processing relative to the volume input to the system was included as an exploratory measure.

RESULTS: Forty-six patients were included in the study (15 per study group, 1 was included with intention to treat after failed screen). The mean age was 54 years (SD 10 y) and mean BMI was 28.6 kg/m² (SD 4.13 kg/m²). There were no significant differences in patient characteristics or demographics between the three groups. Overall, the rate of adipose tissue preparation was significantly different among the three processing systems (AF 9.98 ml/min versus PF 5.66 ml/min versus C 2.47 ml/min, p≤0.0001). More specifically, the rate of adipose tissue preparation with system-AF was significantly higher than system–PF (difference = 4.32 ml/min, p=0.0014) or system-C (difference = 7.51 ml/min, p=0.0001). The rate of adipose tissue preparation with system-PF was significantly higher than centrifugation-C (difference = 3.19 ml/min, p<0.001). Similarly, there was a significant difference in total grafting time between AF vs PF and AF vs C (AF=82.7±8.51 min versus PF=152±13.1 min p=0.0005, versus C=209.9±28.5 min, p=0.0005); however, there was no difference in total operative time between the systems (p=0.82, 0.60). The percent of graftable fat was higher with the active system compared to the passive system and centrifugation (AF=71% versus PF=39%, p=0.0001 versus C=43%, p=0.0001).

CONCLUSION: The results of this study indicate that an active fat graft processing system is more time efficient at graft preparation than a passive fat graft processing system or centrifugation without filtration. Time-and-motion studies such as this provide a reliable methodology to quantify efficiency and establish recommendations for best practices in fat grafting procedures.

No Longer a Pain in the Neck: The Use of an Operating Microscope for Cleft Palate Closure

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Cleft palate repair is an intricate and difficult operation positionally for a craniofacial surgeon. Historically, use of loupe magnification and a headlight can cause significant strain to the surgeon’s neck and, at times, subpar optics for both the operator and the assistant. The use of an operating microscope was first advocated by Sommerland in 2003.1 By using the operating microscope for cleft palate closure in addition to modifying the classic Z-plasty repair, we offer the following surgical pearls:

1. Use of the scope offers improved ergonomics for the surgeon and assistant by allowing for straight in-line back and neck posture with excellent visualization of the surgical field for the entire surgical team.
2. By rotating the viewfinder 90 degrees and utilizing the assistant port, there is direct line of sight to the anterior-most aspect of the palate without compromising surgeon position.
3. The available zoom and focus improves the ability to isolate and repair the levator veli palatani muscle.
4. Modifying the Z-plasty flaps, specifically narrowing the musculomucosal flap and widening the mucosal-only flap, allows for decreased tension along the repair while maintaining adequate vascular supply to the flaps.
5. The use of an Alloderm spacer anterior to the muscular repair allows for decreased contracture to the hard palate and for an unimpeded contraction of the muscle.
6. Photos and videos are used to illustrate these technical pearls.

REFERENCES:
1. Sommerland BC. “The Use of the Operating Microscope for Cleft Palate Repair and Pharyngoplasty.” Plast. Reconstr. Surg. Nov 2003. 112 (6): 1540–41.

Cortical Craniectomy - Effective in the Treatment of the Exposed Skull

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Exposed cranial bone can present a considerable challenge to the reconstructive surgeon. Removal of the outer cortex of exposed skull bone has proven effective in complex situations where traditional reconstruction efforts were not considered ideal.

METHODS: Three patients with exposed skull after treatment for invasive skin cancers were treated with removal of the cortical bone in the areas of exposure. All three patients had desiccated exposed bone at the sites and thin, atrophic skin surrounding the defects that negated local skin flap reconstruction. The patients were elderly, aged 72 to 92, had numerous medical problems and were not judged to be fair candidates for more complex reconstructions. The two smaller defects measured 3 x 4 cm and 4 x 4 cm and were at sites of basal cell carcinoma treatment in men with atrophic scalps scarred from previous surgeries. The largest defect was in a 92 year woman and measured 8 by 12 cm. The defect had been present for more than three years after radiation to the scalp for recurrent squamous cell carcinoma. Intermittent osteomyelitis of the skull necessitated periodic antibiotics. She wore a hair piece over the defect and a malodorous exudate was a constant companion. Reconstruction had been denied by numerous surgeons.

RESULTS: The exposed medullary bone healed in all three patients with this conservative approach. The surgery was performed as an outpatient in all three patients. Conscious sedation was utilized in two patients and one patient required only local anesthesia. The cortex removal with the drill burr was completed in less than one hour, was painless and minimal bleeding was encountered. Granulation tissue developed over the medullary bone within a four week period. Epithelialization was complete in the two smaller defects by the seventh week. The largest (8 x 12 cm) defect was judged to be healed after four months. However, a few small areas within the defect had not fully epithelialized. Clinically, the woman improved rapidly after removal of the infectious process. No osteomyelitis or infectious complications occurred after the cortical craniectomy in these patients.

DISCUSSION: Exposed skull bone is prone to desiccation and subsequent osteomyelitis if left uncovered. Complex reconstructions may not be appropriate in many situations. Atrophic scalp skin, radiation injury after skin cancer treatment and scarring from multiple surgeries often limit reconstructive options. Cortical craniectomy of the exposed skull bone is a simple, local technique that allows for secondary healing of the skull. While skin grafting to defects will shorten healing time once granulation tissue covers the medullary bone, skin grafting was not utilized in these three patients.

Monobloc and Interrupted Sutures to Plicate the SMAS

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Approaching the SMAS during a facelift has become very common, and different techniques have been described,