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INTRODUCTION: Noninvasive body contouring (NIBC) techniques are a new alternative to traditional techniques used for the treatment of lipodystrophy and reduction of unwanted subcutaneous fat. Interest in studying this topic is increasing congruently with patient demand, however, it is unclear what the quality of evidence regarding the various techniques and outcomes measures is.

METHODS: A comprehensive literature review of NIBC technologies was performed using technical and trademark names. Techniques included cryolipolysis, low-level light laser (LLLL), radiofrequency energy devices (RFED), high frequency focused ultrasound (HFUS), suction massage, and thermal devices. Studies describing a combination of techniques were excluded. Information on number of studies/patients, ASPS level of evidence (LOE I to V), subcutaneous fat reduction, statistically significant findings, and adverse effects was collected.

RESULTS: There was heterogeneity in reporting, quality of evidence, and outcome measures. Twenty-five studies (1,344 patients) reported on cryolipolysis. The majority was LOE IV (21 studies, 84.0%), with one LOE II (4.0%), and 3 LOE III (12.0%) studies. Of the 4 studies with LOE III or higher, only 2 reported statistically significant findings. In comparison to contralateral untreated thighs, cryolipolysis was found to have an average fat reduction of 2.6mm (LOE III). Furthermore, treatments at -12°C were more efficacious than those at -15°C, decreasing submental fat by an average of 1.76mm (LOE II).

Eighteen LLLL studies were identified (1,641 patients), the majority of which were LOE IV (15, 83.3%) with one LOE I (5.6%) and two LOE II (11.1%) studies. Of the three studies with LOE III or higher, all reported positive and statistically significant results. Notably, LLLL resulted in a significant cumulative girth loss of 2.15cm (LOE II). MRI revealed significant mean fat reduction of 17% at 3 months (LOE II). A randomized control study (RCS) revealed LLLL to significantly reduce overall circumference measurements of specifically targeted regions, including the waist (0.98in), hip (1.05in) and bilateral thighs (0.85in, 0.65in) (LOE I).

Ten HFUS were identified (855 patients), of which 80% were LOE IV. There were two studies LOE III or higher (LOE I, LOE III), both of which presented positive findings that were not statistically significant. The LOE III study (85 patients) found an average of 4.6cm decrease waist circumference after 3 months. The LOE I study (164 patients) found that HFUS led to a 2.9mm decrease in fat thickness.

Nine studies (227 patients) reported on the use of RFED, the majority of which were LOE IV (8, 88.9%). A single LOE III study (20 patients) found a significant reduction of abdominal circumference from time of treatment at 1 (92.6 cm vs 96.2cm) and 3-month (93.3cm) follow-up. Four studies reported on suction massage (258 patients), all of which were LOE IV. Only one RCT (LOE I) reported on thermal devices and found positive results with regards to cellulite improvement.

CONCLUSION: There is a paucity of Level I-III evidence studies on NIBC technologies. Among NIBC modalities, cryolipolysis and LLLL appear to have the most evidence-based support. Nonetheless, higher-level studies should be pursued in this area of plastic surgery.

Mega-Liposuction with High Definition Concepts

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BACKGROUND: Liposuction, being one of the most prevalent cosmetic methods performed worldwide, still has a significant debate on how much liposuction can be accomplished in one session.[1–6] Essentially this needs to be done without affecting patient's satisfaction, the adequacy of the results and maintaining the patient's safety.

PATIENTS AND METHODS: This is a prospective case series performed by the authors in a private practice. All our patient had mega liposuction sessions (more than 8 liters) using Power-assisted Liposuction (PAL) with Lipomatic© by Euromai and VASER©. Tumescent infiltration was used. Fifty patients (21 females and 29 males) participated in this study after providing their informed consent with age (range from 21 to 50) and (BMI) range from 28 to 40. Exclusion criteria included patients with Hemoglobin level less than 12gm/ml, medical/family history of coagulopathy. Patients with history of previous liposuction were also excluded (including Redo and revision cases).

RESULTS: The minimum percent of the amount of fat aspirated of body weight during the procedure was 7% and the maximum was 22%. Incidence of anemia was 8% of cases. The Results were evaluated by patient's satisfaction score (from 0 to 30). 41 patients reported a score of (25–30), 5 reported (20–25), 2 reported (15–20) and 2 reported (10–15). The latter 4 patients had minor complications like Seroma and excessive fatigue and tiredness.

CONCLUSION: Mega liposuction is a demanding procedure by both the surgeon and the patient to achieve the best results and contour. With adequate planning, patient selection and adequate setting, Mega-liposuction can be very pleasing and a safe procedure performed with up to 25 liters of fluid aspirated.

REFERENCES:

1. Iverson RE, Lynch MD, and the ASPS Committee on Patient Safety. Practice advisory on liposuction. Plast Reconstr Surg. 2004;113:1478–1485.
2. Albin R, de Campo T. Large-volume liposuction in 181 patients. Aesthetic Plast Surg. 1999;23:5–15.
3. Commons GW, Halperin B, Chang CC. Large-volume liposuction: a review of 631 consecutive cases over 12 years. Plast Reconstr Surg. 2001;108:1753–1763.
4. Klassen AF, Cano SJ, Alderman A, Soldin M, Thoma A, Robson S, et al. The BODY-Q: A Patient-Reported Outcome Instrument for Weight Loss and Body Contouring Treatments. Plast Reconstr Surg Glob Open [Internet]. 2016 Apr 13 [cited 2017 Nov 10];4(4). Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4859238/
5. Cárdenas-Camarena L, Tobar-Losada A, Lacouture AM. Large-volume circumferential liposuction with tumescent technique: a sure and viable procedure. Plast Reconstr Surg.1999 Nov;104(6):1887–99.
6. Dhami LD, Agarwal M. Safe total corporal contouring with large-volume liposuction for the obese patient. Aesthetic Plast Surg.2006 Sep-Oct;30(5):574–88.

BREAST SESSION 1

Deferoxamine Increases Breast Cancer Radiosensitivity

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OBJECTIVE: Radiotherapy reduces the risk of breast cancer recurrence by destroying residual cancer cells post-surgery. The detrimental effect of radiation on surrounding tissues, however, significantly increases complications including reconstructive failure during both autologous and implant-based breast reconstruction.[1] Pharmacologic treatments aimed at mitigating radiation-induced injury have the potential to improve outcomes among these patients. Specifically, recent studies in our laboratory suggest deferoxamine (DFO) is capable of reducing skin ulceration and collagen fibril disorganization following radiation. What remains unclear, however, is whether breast cancer cells are concomitantly protected, a factor that would worsen cancer-specific outcomes among patients undergoing reconstruction. The purpose of this study is to determine the impact of DFO delivered in combination with XRT on breast cancer cell proliferation to ensure that tumor growth will not be concomitantly enhanced given the obvious improvements in skin viability resulting from DFO treatment.

METHODS: Two triple-negative breast cancer cell lines, MDA-MB-231 and MDA-MB-468, were obtained from the University of Michigan Comprehensive Cancer Center and grown in culture. The dose-dependent effect of XRT (0, 5, and 10Gy) and DFO (0, 25, 50, 75, and 100μM) on proliferation of each cell line was determined via hemocytometer. Then, the radiosensitivity of these cell lines was determined at 10Gy of XRT and increasing doses of DFO. All three experiments were replicated via an MTS assay, a colorimetric assay for assessing cell metabolic activity, to fortify the results. All experiments were performed in triplicate. Statistical analysis was performed at $p<0.05$ significance using SPSS.

RESULTS: Cell number significantly decreased in both MDA-MB-231 ($171x10^4$ to $86x10^4$, $p=0.00$) and MDA-MB-468 ($145x10^4$ to $31x10^4$, $p=0.00$) cells following exposure to 5Gy of XRT. Surprisingly, cell number also significantly decreased in response to 25μM DFO (MDA-MB-231: $171x10^4$ to $34x10^4$, $p=0.00$; MDA-MB-468: $145x10^4$ to $13x10^4$, $p=0.04$). The sensitivity of both triple-negative breast cancer cell lines to 10Gy of XRT increased