Aesthetic Abstracts and Citations

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In this Aesthetic Abstract and Citations section, we highlight and briefly discuss recently published articles from other peer-reviewed journals that may be of interest to our readership in oculoplastic surgery. These are just cursory reviews to peak an interest on subjects, which the individual reader may desire to pursue in more detail by reading the manuscript in full.

This last 2 months there were fewer articles of significance published related to our specialty. As such, the first 2 reports, while not published within this time frame, were topics selected based on questions that have been posed by members of our society. They are both interesting and useful.

Zeltzer AA, Tonnard PL, Verpaele AM. Sharp-needle intradermal fat grafting (SNIF). *Aesth Surg J* 2012;32:554–61.

In the previous edition of this section in *OPRS*, a new technique of fine wrinkle filling with the synthetic hyaluronic acid (HA) gel filler Belotero was presented. Prior to this description, an unaltered (nondiluted) HA filler treatment for facial fine lines had not been reported. In the past, collagen-based products were used for this purpose, but they have since been removed from the marketplace. In this article, the authors describe their experience treating 250 patients for facial fine lines with autologous fat injected with a sharp 23-gauge needle in the superficial dermal plane (intradermal)—the "SNIF" procedure. Typical lipofilling has been described primarily for volume restoration by filling subdermally through a 0.9-mm tip or similar blunt cannula. Blunt cannulas are suggested to be important as to prevent inadvertent intravascular injection with potential serious sequelae such as blindness and stroke. Less serious but troublesome problems such as lumps/bumps and contour irregularities can also occur related to the amount, particle size, and depth of fat injected and the body's immune response to the grafted fat. In the SNIF procedure a 2- to 3-mm harvesting cannula with numerous 1-mm sharp ports is used as a tissue "rasp," to harvest smaller particles of fat. The ratio of fat to infiltrate is roughly 1 to 5 much less than with standard fat harvesting with larger ports traditionally used for deeper lipofilling. The authors stress that for a given volume of fat, the radius of fat particles is inversely proportional to the surface contact area. Smaller particles, thus, have a larger surface contact area. "A larger contact surface means better contact with the capillaries in the recipient area and thus a better graft survival rate with less need for overcorrection, which translates into lower morbidity." This has subjectively been true in this series as the results on the patients studied (average age, 53 years; mean follow up, 14 months) were excellent (nice pre- and postprocedure photos shown) without more than minor complications such as prolonged bruising and swelling. In addition, 32 patients required a second procedure, for undercorrection, on average 8 month after the first treatment. No vascular complications or contour issues developed. It is important to note that most patients had the perioral and glabellar areas treated. Also, of note is that many patient underwent adjunctive Erbium:YAG skin resurfacing in addition to the SNIF procedure. The authors experience is that the 2 procedures acted synergistically to improve outcome.

The authors marked all rhytids preoperatively and preinjected these areas with xylocaine admixed with epinephrine to vasoconstrict vessels prior to superficial dermal fat transfer. Only a slight overcorrection is created, which resolves within a few hours. A blanching of the skin is noted after injection. Finally, the SNIF technique can be added to more traditional deeper volume filling with fat to address both volume and fine rhytids simultaneously.

Message: This is an important article to review for all who perform fat transfer. The salient point is that superficial dermal lipotransfer is very different from deeper subdermal filling. Smaller particles are harvested and injected to improve outcome and reduce complications. Also note that while blanching after superficial (intradermal) injection of HA filler (Belotero) or fat is a normal finding, blanching after subdermal injection is not and should raise suspicion of vascular compromise. The article lacks objective findings but is interesting and may hold promise for treatment of facial fine lines

Abraham RF, DeFatta RJ, Williams EF. Thread-lift for facial rejuvenation: assessment of long-term results. *Arch Facial Plast Surg* 2009;11:178–83.

The thread lift, a less invasive facial lifting procedure than formal surgical procedures, was first introduced in the 1990s. All variants of the procedure rely on a similar basic technique, which involves subcutaneous placement of cogged threads along a planned trajectory to lift and suspend ptotic facial tissue. In the United States, the Contour Thread-lift system (Surgical Specialties Corp., Reading, PA) was approved by the US Food and Drug Administration (FDA) in 2005. The only requirement by the manufacturer to purchase the "thread" and proceed with the procedure was a 1-day course on its use. There have never been good long-term assessments of the results to this surgery. In this report the authors compared aesthetic outcomes of 3 sets of patients who underwent facial rejuvenation procedures to address the brow, midface, jowls, and neck: 1) those who had thread lift only (10 patients), 2) those who had thread-lift and additional facial procedures including skin peels, synthetic filler, fat transfer, and blepharoplasty (33 patients), and 3) a control group who had facial aesthetic procedures without thread lift. Four board-certified facial plastic surgeons graded surgical results on a 0 to 3 scale (0, no improvement; 1, minimal improvement; 2, moderate improvement; and 3, considerable improvement). Their assessment was based on comparison of pre- and postoperative digital photographs (mean follow up, 21 months). The general finding is that the thread lift alone led to minimal improvement more than short term (felt related to edema) and that the results of both thread-lift and additional procedures or the control group (no thread lift) were superior. The authors suggest that the procedure yields suboptimal results because it does not produce volumetric enhancement; it elevates tissue only in a superficial plane and no skin is removed. They

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also stress that superficial placement of the thread yields potential for significant postprocedural morbidity including: thread breakage and extrusion, skin dimpling, superficial hemorrhages, mild asymmetry, and persistent erythema, edema, and pain. In their series, 4 patients (of 33 or 12%) required thread removal for various reasons.

As a result of a number of reports on procedure-related complications, the Contour Thread-lift system used in this series lost its FDA approval and is no longer available in the United States. However, other similar systems are. The authors advocate avoidance of this procedure because it yields no more than very short–term benefit and typically poor patient satisfaction. They conclude the report with this statement: "The use of the thread-lift for facial rejuvenation is a technology in which the results of surgery may not justify the patient risk involved."

Message: The results section of the report lacks detailed presentation of data, but the message is clear. This article is included for those with questions regarding the thread-lift procedure. More information can be gathered from references included in the report.

Berros P, Lax L, Bétis F. Hyalurostructure treatment: superior clinical outcome through a new protocol—A 4-year comparative study of two methods for tear trough treatment. *Plast and Reconstr Surg* 2013;132:924e–31e.

As hyaluronic acid (HA) gel fillers have become a more mainstream option for tear tough effacement, there is an ongoing drive to determine better techniques of filler placement with the goal of improving outcomes, reducing complications, and enhancing patient satisfaction. In this report, the authors describe a comparative study on injection treatments used since 2009. Patients were either injected with an "older" approach, Group A (2009), or a newer approach, Group B (2010–2012). Group A patients received treatment after topical anesthetic cream (EMLA 5% dermatological cream, Astra Zeneca Global, Cambridge, United Kingdom) application 1 hour before the injection, local injection of 0.2 cc of 1% adrenalized xylocaine, delicate massage of the treated zone, preinjection entry port creation with a 23-G needle, HA injection with a 25-gauge cannula from a lateral periorbital entry point positioned parallel to the periosteum, and a 0.6- to 1.0-cc bolus gel delivery. After injection, ice application and local massage for 5 minutes was applied. Group B patients' treatment differed in that there was preinjection cooling of the periorbital area, injection entry was below the orbital rim with displacement of the malar fat pad, and the HA gel was delivered with miniboluses and gentle back and forth movements. Also in this group, patients were given 48 hours of oral cortisone 1 mg/kg.

The authors began the Group B protocol because complications such as swelling and hematoma were high with Group A patients. As Group B patients had fewer complications, this method has been adhered to since 2010. As such, there are more study participants in Group B (135 patients) vs. Group A (41 patients). Patients were seen 2 to 7 days after injection for immediate assessment and up to 1 year after injection for late assessment. Evaluation included clinical identification of complications by the injector and a specific patient satisfaction questionnaire, which the patients responded to (immediately after injection and at 1 year after treatment). Salient findings were that complications such as hematoma, swelling, surface irregularities, HA migration, and pigmentation alteration were much higher in the Group A patients. Hyaluronidase injection to reverse complications was also significantly higher in the Group A patients. Only the injection technique (Group A) and a history of previous blepharoplasty had a statistically significant correlation with complications. Patient satisfaction was much higher in the Group B patients on immediate postinjection visit (88% satisfied in Group B, 56% in Group A), while at 1 year, patient satisfaction was roughly equal.

The authors suggest that 1) pretreatment cooling, because of secondary vasoconstriction, reduced swelling and potential hematoma formation; 2) injecting lower, from below the orbital rim, avoids the more vascular lateral entry point; 3) microbolus injections with gentle movement reduces tissue injury and subsequent complications; and 4) oral steroid use quickens recovery.

Message: This is an interesting study that shows a significant difference in complications by the 2 treatment modalities. It is worth evaluating in an effort to improve patient outcomes.

Cavallini M, Gazzola R, Metalla M, Vaienti L. The role of hyaluronidase in the treatment of complications from hyaluronic acid dermal fillers. *Aesth Surg J* 2013;33:1167–74.

Hyaluronidases are enzymes that degrade hyaluronic acid (HA), an essential component of the extracellular matrix. HA is a glycosaminoglycan, which acts as a tissue glue linking protein filaments, collagen fibrils, and connective tissue cells. As hyaluronidase degrades HA, it reduces the viscosity of the HA molecule and increases tissue permeability. As such, hyaluronidase is used in conjunction with other drugs to speed their dispersion and delivery. HA now has widespread use in aesthetic medicine as a subdermal filler for volume restoration. Complications of its administration include vascular compromise from direct vascular compression or embolic events, granulomas (HA nodules), overfilling, and a bluish skin discoloration (Tyndall effect). Hyaluronidase has been Food and Drug Administration approved for use as an adjuvant to increase the absorption and dispersion of other injected drugs, to produce hypodermoclysis (improve interstitial infusion or subcutaneous infusion of a drug), and as an adjunct in subcutaneous urography for improving reabsorption of radiopaque agents. It has been used off-label for edema reduction, treatment of vitreous hemorrhage, and for the treatment of the aforementioned complications related to subdermal injection for aesthetic purposes.

There are various preparations of hyaluronidase products. The article highlights Vitrase and Amphidase, which are animal-derived products, and Hylenex, which is a human recombinant form. The animal-based products can lead to allergic reactions. Hyaluronidase is measured in Units, and the dose given for filler injection complications is described in Table 1 of the article, with a referenced range of 3 to 75 U. Specifically, in the periorbital area, the article suggests a dose of 30 U. Clearly, the dose required depends on the clinical nature of the problem (Table 1 is just a guide) and the filler used. Higher concentration fillers with more extensive cross linking will require more product to dissolve the HA molecule. Repeat injections are guided by clinical judgment and are suggested as every 3 weeks in the article.

Message: Everyone who injects HA gels must familiarize themselves with the various hyaluronidase products and their

clinical use. This review is well referenced and will serve as a good guide for injectors. The article omits mentioning Hydase, a Bovine-derived hyaluronidase which is preservative free, and does not differentiate the origin of Amphidase (Bovine) and Vitrase (Ovine). As Hylenex is human derived, it is safer (less allergic reactions), but it is also 3 times the cost. This reviewer routinely uses Vitrase and has experienced only 2 allergic reactions of significance in hundreds of treatments. These resolved with oral steroid administration. A small skin test can be performed prior to injection. To this reviewer's knowledge, there are on reported cases of animal pathogen transmission associated with animal-derived hyaluronidase products.

Wysong A, Joseph T, Kim D, Tang JY, Gladstone HB. Quantifying soft tissue loss in facial aging: a study in women using magnetic resonance imaging. *Dermatol Surg* 2013;39:1895–902.

Over the last 15 years, aesthetic surgeons have come to understand that facial aging is a complex multifactorial process involving involutional changes in skin, muscle, fat, and bone. Both tissue descent and deflation (volume loss) are assuredly culprits in these changes, which lead to a characteristic reversal in the overall topography of the face, from a heart shape with fullness above, to an inverted heart where relative fullness predominates below. In this study, the authors reviewed facial MRIs of female patients imaged for various reasons (headache, vision change, tumor, cranial neuropathy etc.) over a 3-year period with multiplanar T1 images. This modality was selected because it provides the best anatomical details for examining soft tissue in the face and neck. Patients with systemic malignancy, facial soft tissue abnormalities, facial infections, conditions leading to body wasting, those who had previous facial surgery, and those whose MRIs demonstrated image and/or motion artifact were excluded. The MRIs were evaluated for soft tissue thickness in the temple, infraorbital area, and the medial and lateral cheek (measured in millimeters from fixed reference points). Three repeat measurements were taken at each location by a blinded radiologist and averaged for accuracy. The MRIs were divided into 3 groups: 1) young (average age, 29; 20 patients), 2) middle aged (average age, 55; 20 patients), and 3) older (average age, 79; 18 patients). In each group, patients had similar body mass indices and racial and ethnic distributions. Soft tissue thickness decreased significantly from young to middle age in the temples, infraorbital region, and medial and lateral cheek. These changes were stable in all areas from middle age to older age in all but the infraorbital region, which continued to thin, but less so. The greatest loss of soft tissue was in the temple region. Overall, from young to old, there was a 32% reduction in soft tissue thickness in the temples, 27% in the infraorbital area, 22% in the lateral cheek, and 21% in the medial cheek. Measurements taken in different age groups were in different women, so standard follow-up measurements on the same individual were lacking.

Message: This is a valuable article as it brings out some interesting points to aesthetic specialists. First, the temples deflate significantly with age. This strongly impacts facial proportions and should be addressed when planning aesthetic enhancement. Also, of all areas studied, only the orbital rim hollows showed continued tissue thinning from middle age to old age. This could mean that up to age 60 in women, volume loss predominates, with tissue descent more impactful with older age.