results with minimal complication rates in this population with increased age and multiple comorbidities. The rate of revision with regard to ptosis correction or upper blepharoplasty was 10.2% in our cohort. Care must be taken to prevent the incidence of overcorrection after ptosis repair leading to revision, as it was the case in 4.1% of the cases in our cohort. This was comparable to prior studies. Larger studies with higher power are required to better identify predictors of revision after upper blepharoplasty combined with eyelid ptosis correction.

REFERENCE:
1. Chou E, Liu J, Seaworth C, et al. Comparison of revision rates of anterior- and posterior-approach ptosis surgery: a retrospective review of 1519 cases. *Ophthalmic Plast Reconsr Surg*. 2018;34(3):246–253. doi:10.1097/IOP.0000000000000938.

The Role of Tranexamic Acid in Plastic and Reconstructive Surgery: A National Perspective

**Presenter:** Stav Brown, MD

**Co-Authors:** Tal Brown, Peter Taub, MD, Rod Rohrich, MD, FACS

**Affiliation:** Sackler School of Medicine, Tel Aviv University, Israel

**BACKGROUND:** Tranexamic acid (TXA) has emerged as a promising agent for reducing perioperative bleeding and has recently gained popularity in aesthetic procedures. In addition to its antifibrinolytic effects, TXA's promising role in aesthetic procedures can be mainly attributed to its anti-inflammatory. Minimizing edema and ecchymosis may be significantly beneficial in aesthetic procedures, where postoperative edema may mask results and influence patient and surgeon perception of surgical outcome for months postoperatively. Despite its increasing popularity and promising role in plastic surgery, standardized guidelines for optimum administration of TXA have not been yet established. This study is the first to report the current practices of TXA usage in plastic and reconstructive surgery among American plastic surgeons toward the establishment of standardized guidelines for safe and effective administration.

**METHODS:** An online survey was sent to all members of the ASPS. The survey was organized into three parts: (1) practice profiles, (2) familiarity, perceptions, and experience with TXA in the full range of plastic surgery, and (3) TXA administration protocols, including dosage and mode of administration in aesthetic surgery.

**RESULTS:** In total, 502 ASPS members completed the survey (21% response rate). One hundred percent of respondents were attending physicians. An estimated 17.8% routinely use TXA in plastic surgery. The main fields in which TXA is most popular are aesthetic surgery (90.6%) and craniofacial surgery (86.7%). However, 70.2% of respondents do not see any advantage of using TXA in the nonsurgical setting. The most common procedures performed under TXA are face-lift (70.0%), neck lift (62.0%), and rhinoplasty (50.0%). The most common breast procedures are breast reconstruction (50.0%) and breast reduction (32.3%). Soft tissue fillers are the most common nonsurgical procedures performed under topical TXA (35.3%). The majority of respondents give TXA as an IV bolus (50.0%), and/or topically (47.0%). A standard dose of 1 g (41.2%) is most commonly utilized for IV bolus, and the most common TXA solution concentration used for topical administration in aesthetic surgery is 3% (25.0%). Surgeons who routinely use TXA-reported reduced blood loss, improved surgical field, and reduced postoperative ecchymosis. In total, 95.7% of TXA users have never observed any TXA-related complications.

**CONCLUSIONS:** This is the largest study to date to provide a broad view of TXA’s utility of use among American plastic surgeons. The results emphasize TXA’s promising role in the armamentarium of the aesthetic plastic surgeon due to its favorable safety profile and outstanding clinical benefits in minimizing perioperative blood loss, reducing postoperative ecchymoses and edema, and improving patient outcomes.

Enzymatic Subcision and Remodeling after Collagenase *Clostridium histolyticum*-Aaes Subcutaneous Injection: Updated Evidence from Porcine and Human Studies

**Presenter:** Shridharani Sachin, MD, FACS

**Co-Authors:** Ashish Bhatia, MD, FAAD, Shannon Dalton, PhD, Saji Vijayan, MBBS

**Affiliation:** LUXURGERY, New York, NY

**BACKGROUND:** CCH injection is approved for the treatment of moderate-to-severe cellulite in the buttocks of adult
women. Porcine/human studies were conducted to further determine the subdermal impact of CCH, including that on dermal thickness.

**METHODS:** Porcine study: CCH (0.07 mg) or placebo injections in 10 ventral sites.

**Human Study 1:** Women undergoing abdominoplasty received 1 or 2 CCH doses [Areas 1 (2 doses/site) and 2 (1 dose/site) using a three-aliquot or 7 injection/14-aliquot injection technique] of 0.07 mg.

**Human (REAL) Study:** Women with mild/moderate cellulite on buttocks or posterolateral thighs received up to 0.84 mg of CCH per treatment area per session (up to 12 dimples) for up to three sessions (Days 1, 22, and 43). At a single study site, ultrasound assessed dermal thickness on Days 1, 22, 43, 90, and 180.

**RESULTS:** Porcine Study (n = 3): Histology showed lysis/disintegration of interlobular subdermal septae in CCH-treated tissue. As collagen support was lost, blood leakage from the thinner endothelial venules was observed in Day-4, Day-2, and in Day-23, Day-2 injection sites. This correlated with site bruising/edema. Collagen neogenesis and subdermal structural reorganization were evident as early as 4 days after CCH dosing in Day-4 and clearly defined in Day-8 and in Day-29, Day-8 injection sites. Marked subdermal fat and collagen structural reorganization was evident at Day-21 and at Day-42, Day-21 injection sites. No changes were seen with placebo.

**Human Study 1 (n=10):** In patients who received the three-aliquot injection technique, in 1 patient (pt), new, immature collagen fibers and fragmented mature collagen fibers were present within 1 day of CCH dose, and mainly immature collagen fibers and a homogenous distribution of smaller fat lobules were evident 1 day after the second CCH dose. Three days after CCH injection, in the second pt, there were new, immature collagen fibers, fragmented mature collagen fibers, and hemorrhage. In that pt, less hemorrhaging and a homogenous distribution of smaller fat lobules were evident after second CCH dose versus single-dose findings (Day-3). In the third pt, septae expansion, increase in immature versus mature collagen fibers were evident 14 days after the first CCH dose; immature collagen fibers, fragmented mature collagen fibers, and homogenous distribution of smaller fat lobules were visible 43 days after the first and 22 days after the second CCH dose. In pts who received the seven injection/14-aliquot injection technique, less hemorrhage and less impressive collagen changes were observed compared with three-aliquot pts at the same timepoints, but over a wider area of tissue. In 2 pts, there was further septae expansion and increase in mature versus immature fibers at >90 days after the second injection.

**Human (REAL) Study:** Ultrasound data are pending.

**CONCLUSIONS:** CCH injection was associated with Enzymatic Subcision and Remodeling, which involves lysis of mature, collagen-rich septae, stimulation of neocollagenesis, and reorganization of adipose lobules. A focus injection and grid-like injection techniques both showed histological changes, with the focus injection injection showing more robust changes but over a small area of tissue.

**Four-flap Breast Reconstruction: Assessing Breast-Q and Donor Site Morbidity in Bilateral Stacked Autologous Breast Reconstruction**

**Presenter: Ryan Dickey, MD**

**Co-Authors: Ricardo Garza, MD, Yulun Liu, PhD, Sumeet Teotia, MD, Nicholas Haddock, MD**

**Affiliation: University of Texas Southwestern, Dallas, TX**

**BACKGROUND:** Patients undergoing bilateral autologous breast reconstruction may benefit from increased flap volume using bilateral stacked deep inferior epigastric perforator (DIEP) and profunda artery perforator (PAP) flaps. Four-flap reconstruction patients are a unique population in which to compare donor site morbidity of two commonly used perforator free flaps in breast reconstruction (DIEP and PAP). Our aim was to characterize the donor site morbidity and overall patient outcomes of four-flap breast reconstruction patients.

**METHODS:** A retrospective chart review was performed for all patients undergoing four-flap breast reconstruction by two surgeons between 2014 and 2020 at a single academic medical center. All patients were contacted to complete the BREAST-Q reconstructive module and the Lower Extremity Functional Scale, as well as a postoperative subjective survey comparing donor sites. Inpatient surgical site pain location and pain scores by Numeric Pain Rating Scale were recorded during the immediate postoperative admission. Four-flap BREAST-Q scores were then compared with bilateral DIEP and with bilateral PAP patients.