Augmented Reality in Breast Reconstructive Surgery - Projecting Pre-operative DIEP Flap Planning onto Patients in a Randomized Controlled Trial

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In Deep Inferior Epigastric Artery Perforator (DIEP) flap breast reconstructions, the survival of this free flap relies on perforators, providing blood supply to the newly molded breast. Preoperative mapping of these randomly distributed blood vessels is of the essence to avoid complications. Depicting these perforators can be achieved through Computed Tomography Angiography (CTA), on which a virtual DIEP flap pre-operative planning can be created by post-processing techniques. Through means of a newly developed innovative hand-held projection device, this planning can be projected directly onto the patient’s abdomen, ensuring a stabilized and aligned representation of the surgical planning regardless of movement of the patient or projection system. In this clinical trial, it was investigated whether the pre-operative projection of a virtual planning directly onto the patient’s abdomen leads to more correctly identified perforator locations and less operation time spent on dissecting the free flap compared to the commonly used handheld Doppler ultrasound method.

The study design was a, open, single-center randomized controlled trial in patients undergoing a DIEP flap breast reconstruction between December 2015 to March 2017 with 1 week follow-up. The participants (n=60) undergoing a DIEP flap breast reconstruction without a lymph node transfer were randomly allocated in either the projection group (n=33, age 52±9 yrs, BMI 26.5±2.0), or the control group (n=27, age 50±8 yrs, BMI 26.8±2.7). In the projection group a virtual 3D planning was created, projected and traced onto the patients’ abdomen prior to surgery using the newly developed projection device, where in the control group the perforators were located using handheld Doppler ultrasound method.

In total, sixty patients provided 69 DIEP flaps for analysis. The projection method is convenient in practice and capable preoperatively of displaying significantly more perforators compared to the Doppler method (respectively 61.7% ± 7.3% versus 41.2±8.2%, p=0.020) and decreasing flap harvest time by 19 minutes (136±7 versus 155±7 minutes, p=0.012). Complications were comparable across both groups.

Not only can more perforators be identified intraoperatively using the projection method compared to handheld Doppler ultrasound, but there is also a significant time reduction in harvesting the DIEP flap without increasing complications.

**SURGICAL PEARLS SESSION**

**Dermal Fillers in Secondary Rhinoplasty**

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**INTRODUCTION:** Rhinoplasty is one of the most common surgical procedures performed by plastic surgeons worldwide. Over the years there have been numerous anecdotal reports of dorsum irregularities, and loss of tip definition post rhinoplasty. Subsequent surgical revisionary procedures can aggravate the problem causing an even noticeable dorsum irregularities and less defined nasal tip. The final result can be often worse than the preoperative condition and difficult to correct.1,2

The use of injectable fillers for nonsurgical rhinoplasty has increased tremendously over the past decade. With the advent of newer injectables with greater longevity, and less immunogenicity, nonsurgical rhinoplasty has become a viable alternative to revisionary surgery. An understanding of the surgical anatomy of the nose, particularly in a postrhinoplasty patient, affords the plastic surgeon injector the opportunity to better plan the injectable treatment.3, 4, 5

The aim of this work is to outline the evolution of nonsurgical rhinoplasty and identify properties to consider when selecting which dermal filler to use. It includes a description of the types of postrhinoplasty deformities that can be treated with injectables, as well as the role of nonsurgical
rhinoplasty in a comprehensive regimen for correction of nasal deformities. This review describes the most commonly used fillers and their indications in the context of recent reports of both their successes and failures.

METHODS: Retrospective chart review between March 2006 and December 2017. Clinical and demographic features of the patients, technique, satisfaction rates, and complications were recorded.

RESULTS: 135 patients that had undergone nonsurgical postrhinoplasty procedures with dermal fillers were included in the study. We recorded a high satisfaction rate and observed a 7% complication rate.

CONCLUSION: Non-surgical nose augmentation with dermal fillers is an easy, safe, and comfortable technique. It appears that plastic surgeons need to assume a more active role in nonsurgical postrhinoplasty procedures not as a substitute for the revisionary surgery, but as an option in selected patients.

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Bleomycin - A New Drug to Tackle Difficult Vascular and Lymphatic Malformations

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Vascular anomalies are a common occurrence and are found in all age groups and both sexes with equal impunity. All vascular anomalies are categorized into two broad groups namely haemangiomas and vascular malformations. Haemangiomas are vascular tumours with pathologic cell proliferation while malformations on the other hand are comprised of abnormally formed channels within a vascular apparatus lined by endothelial cells that do not undergo cellular turnover. Vascular malformations gradually grow in size with the patient and slowly achieve large proportions involving and displacing the body tissues like muscle, nerve, bone and hence cause difficulties in surgical excision. Advanced vascular malformations are hence a surgical challenge as the surgeon often has to decide between total surgical excision with loss of function as opposed to partial excision while retaining full function. These malformations often occur in a surgically inaccessible location like deep in the palate, behind the maxilla, inside orbit or sometimes engulf a particular area like the perineum and in these circumstances, surgical excision becomes difficult. Many pharmacological agents have been used for treating vascular anomalies and amongst these, bleomycin stands out as the most promising agent for such difficult lesions. Bleomycin has been found to be effective in reducing the size and vascularity of the lesions from 50%-70% over a period of 5–6 sessions. The average dose of bleomycin has ranged from 8–15 IU intralesionally. It is most effective in venous and lymphatic lesions especially those that are large in size and located in deep areas. Patient demographics, lesion characteristics, imaging findings, treatment course, radiological and clinical response to treatment were recorded. Lesions were sub-categorized into venous malformation, including mixed venous-capillary (n=29) or lymphatic malformation (LM) (n = 8). One hundred three out of 112 patients experienced no complications. Local complications included superficial skin infection (n=4), skin necrosis (n=5), hyperpigmentation, and minor contour deformity. There was no recurrence and no systemic side-effects to bleomycin. In conclusion, serial intralesional bleomycin injections can be effective and also safe for the successful management of symptomatic or disfiguring vascular malformations and are a great adjunct to surgery.

Tumescent Anesthesia in Breast Augmentation and Reconstruction: Tips to Make Surgery Easier