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**BACKGROUND:** Optimal management of the thoracodorsal nerve in pedicled latissimus dorsi flaps for mastectomy reconstruction is controversial. The incidence and etiology of animation deformity despite muscle denervation remain poorly-understood. This study examines the incidence and risk factors of persistent animation to guide patient management.

**METHODS:** A retrospective review of a single surgeon’s practice identified breasts reconstructed with a pedicled latissimus dorsi flap including transection of a single branch of the thoracodorsal nerve. The incidence and severity of postoperative animation deformity were examined with identification of potential causative factors: age, BMI, indication for mastectomy, radiation therapy, chemotherapy, hormone therapy, and timing to reconstruction. Patients completed a survey to assess lifestyle implications. A cadaveric dissection of ten latissimus muscles identified anatomical causes of persistent muscle innervation.

**RESULTS:** Forty-one reconstructions with a minimum follow-up of two years (average 6.25 years) identified no significant relationship between postoperative animation and patient or treatment factors. While absent in the first postoperative year, animation deformity was identified in 90% of patients on long-term follow-up, with 32% reporting pain, and 25% indicating lifestyle interferences. This high frequency of animation correlated with cadaveric results that identified multiple branches of thoracodorsal nerve innervating the latissimus in 9/10 specimens. The distance between nerve branches was $5.4 \pm 0.7\text{mm}$, with the point of bifurcation $(5/10)$ or trifurcation $(4/10)$ located $19.7 \pm 2.3\text{mm}$ proximal to the superior muscle margin.

**CONCLUSION:** Persistent animation deformity, despite nerve transection, is likely attributable to anatomical differences in the branching patterns of the thoracodorsal nerve, rather than patient or therapeutic factors. While early follow-up may imply adequate denervation, transection of a single nerve branch is insufficient for long-term prevention of animation deformity in most patients. Exploration for additional nerve branches is suggested; however, not at the risk of endangering the vascular pedicle. Preoperative patient counselling is therefore recommended.

**Neoadjuvant Chemotherapy Is Not Associated with Increased Risk of Complications in Immediate Breast Reconstruction**

**Presenter: Andrew Karam, BSc**

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**PURPOSE:** Advances in the treatment of breast cancer have resulted in the increased use of neoadjuvant chemotherapy (NAC). Women who undergo NAC tend to be younger and have higher rates of mastectomy. These women are also having immediate breast reconstruction (IBR) but there is a paucity of literature evaluating the safety of this practice. The purpose of this study is to evaluate the impact of NAC on complication rates in women undergoing IBR.

**METHODS:** The National Surgical Quality Improvement Program (NSQIP) database was queried to retrospectively evaluate the nature and incidence of postoperative complications of IBR following mastectomy. The study population consisted of two cohorts; one where women had IBR with abdominal flaps and the other consisted of women who had IBR with expanders or implants. To establish the cohort of IBR, patients who didn’t have a mastectomy listed as either a primary or secondary procedure, were excluded. In all, the records of 13833 procedures across NSQIP-participating sites were reviewed for demographics, patient clinical characteristics, preoperative lab values, intraoperative practices, and postoperative complications including incidences of surgical site infection (SSI), reoperation or readmission, need for transfusion, and incidence of a cardiopulmonary or thromboembolic event. Univariate and multivariate regression analyses were used to compare complication rates between NAC and non-NAC populations, and to determine if complication rates were impacted by the receipt of NAC. Independent variables for the regression analysis included patient demographics, medical history, and intraoperative factors.

**RESULTS:** 12000 patients were identified as having implant based IBR; 648 of them received NAC. Patients receiving NAC were younger ($p<0.001$), had lower
pre-operative white blood cell (WBC) counts (p<0.001), and hematocrits (p<0.001), and were less likely to have a history of radiation therapy (XRT) (p<0.001), diabetes (p<0.05), but more likely to receive bilateral mastectomy (P<0.001) and twice as likely to require a dermal matrix (p<0.001). Multivariate analyses revealed that in patients undergoing IBR with expanders or implants, NAC was not associated with higher complication rates, hospital readmission, or reoperation rates.

Of the 1,833 patients who had abdominal flap reconstruction, (Group 2), 89 patients received NAC. The NAC cohort was younger and had lower pre-operative WBC counts (p<0.001), platelet levels (p<0.05) and hematocrit (p<0.001). Multivariate analyses revealed that in patients undergoing IBR with abdominal flaps, NAC was not associated with higher complication rates, hospital readmission, or reoperation rates.

CONCLUSION: The use of neoadjuvant chemotherapy prior to mastectomy is safe for immediate reconstruction, regardless of the type of reconstruction used. In considering the survival and down-staging benefits of neoadjuvant chemotherapy, and the psychological and functional benefits of breast reconstruction, patients should be offered the option of immediate breast reconstruction following NAC related mastectomy.

Breast Reduction with Triple Blood Nourishing of the Nipple-Areola Complex: A Novel Concept of the Transverse Bi-Pedicle Reduction Mammaplasty Based on Würinger’s Septum

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INTRODUCTION/PURPOSE: Numerous breast reduction techniques have developed over the years. The choice of pedicle depends on the degree of hypertrophy, position of nipple-areola complex (NAC), quality of skin, patient’s age, surgeon’s experience and long-term breast shape. A modification of the transverse bi-pedicle reduction mammaplasty is presented for optimization of NAC sensation and blood supply, with satisfactory and durable aesthetic results.

MATERIAL AND METHODS: One hundred twenty patients underwent bilateral breast reduction over a 2-year period with this technique. The lateral/central pedicle carries an identifiable neurovascular supply to the NAC from the lateral thoracic and 4-5th intercostal vessels and nerves from Würinger’s septum. A thin medial pedicle provides additional nourishing from the subdermal plexus of internal thoracic perforators and anterior intercostal arteries and nerves. Reduction is achieved from the inferior and superior parts of the breast in a customized fashion. Thinning of the pedicle, under direct vision and preservation of Würinger’s septum, is carried out as desired in order to ease pedicle mobilization. Skin closure without tension is achieved with inverted-T scar incision. Patient demographics, size of reduction, complications, NAC sensitivity measured with Von Frey filaments and aesthetic assessment at 1 year are presented.

RESULTS: Mean weight of reduced tissue was 760g per breast (range: 480-1200g) and distance of NAC transposition (range 8 to 23cm). All breasts had good projection and NAC sensitivity (87 percent similar to preoperative values) at 1 year. Cleavage fullness and inframammary fold definition persisted over time. Complications: 3 cases of small leaks of fat from the vertical scar.

CONCLUSION: The combination of bi-pedicle dermoparenchymal and Würinger’s septum breast reduction is a technique that can be used for a wide range of macromastia with optimal NAC sensation and breast remodeling. It is safe and versatile and therefore has become our favored technique in a teaching hospital.

Effect of Surgical Complications on Health-Related Quality of Life Outcomes in Adolescents and Young Women Following Reduction Mammaplasty

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