Tassos Dionisopoulos, MD, FACS, FRCSC

**Affiliation:** McGill University Health Centre, Montreal, QC, Canada

**BACKGROUND:** Direct to implant (DTI) prepectoral breast reconstruction has recently resurged due to its several advantages including reduced postoperative pain and animation deformity. 

Furthermore, prepectoral reconstruction is associated with decreased hospital stay, faster return to work, and an earlier return to activity compared to subpectoral procedures. 

**METHODS:** Sixty-five consented adult patients undergoing DTI prepectoral breast reconstruction postmastectomy completed BREAST-Q questionnaires preoperatively and at 6 and 12 months postoperatively. The primary outcome was BREAST-Q scores mainly satisfaction with breasts, psychosocial well-being, sexual well-being, and physical well-being. In addition, 201 patients were assessed for esthetic outcomes including the need for revision surgeries, implant-related issues, deformities, and capsular contracture. Repeat-measure analyses of variance and dependant t tests were performed on the primary outcomes. Moreover, a bivariate analysis using a Fisher exact test and a regression model correcting for covariates were performed.

**RESULTS:** Mean satisfaction of breast decreased from 59.2 preoperatively to 58.3 at 12 months (P > 0.05; n = 41). Psychosocial well-being improved from 69.1 preoperatively to 73.5 at 12-month follow-up (P > 0.05; n = 41). Physical well-being of the chest did not significantly change from 76.1 preoperatively to 75.2 at 12 months follow-up (P > 0.05; n = 41). Likewise, sexual well-being did not significantly change from 61.5 preoperatively to 60.9 at 12 months. There was no significant effect of acellular dermal matrix or postmastectomy radiation therapy on any of the PROs studied domains. The esthetic profiles of the patients results are also presented.

**CONCLUSION:** Patients who underwent DTI prepectoral breast reconstruction were overall satisfied with outcomes. They were as physically satisfied with their implanted breast as they were with their premastectomy natural breasts. Moreover, the results show that patients’ sexual well-being and psychosocial state were not affected by the surgery as evident at 6 months and 1-year follow-ups.

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Amifostine Curtails Pathologic Alterations of Type I Collagen in an Irradiated Breast Reconstruction Model: A Raman Spectroscopic Analysis

**Presenter:** Alexandra O. Luby, MS

**Co-Authors:** Alicia E. Snider, MD; Gurjit S. Mandair, PhD; Jeremy V. Lynn, BS; Kevin M. Urlaub, BS; Noah S. Nelson, MPH; Alexis Donneys, MS, MD; Steven R. Buchman, MD

**Affiliation:** University of Michigan, Ann Arbor, MI

**OBJECTIVE:** As indications for adjuvant radiation therapy (XRT) have expanded in recent years, an increasing number of breast cancer patients are receiving XRT as a component of treatment. Although XRT is highly effective, it often damages the skin and soft tissues of the breast. Radiation-induced damage to dermal type I collagen reduces cutaneous elasticity and strength, which can ultimately limit patient candidacy for expander-based breast reconstruction. In the present study, we utilized amifostine (AMF) as a prophylactic radioprotectant with the objective of mitigating dermal type I collagen injury associated with XRT. To investigate this, we utilized Raman spectroscopy to analyze the chemical properties of dermal type I collagen in a murine model of irradiated expander-based breast reconstruction.
METHODS: Female Lewis rats were grouped (n = 7/group): expander without XRT (Control); expander + XRT (XRT); and expander + AMF + XRT (AMF). Expanders were surgically placed in a submusculocutaneous plane on the dorsum of the animal and filled to achieve a final volume of 15 ml. Both the XRT and AMF group received a total XRT dose of 35 Gy. The AMF group received AMF pretreatment 30 minutes before XRT. After a 20-day recovery period, tissues overlying the expander were harvested and sectioned. Raman spectroscopy was performed to study the chemical properties of dermal type I collagen.

RESULTS: Based on the (853 + 877)/1,657 cm⁻¹ band intensity ratio (Pro+Hyp/Amide-I ratio), collagen turnover was impaired in expanded, irradiated tissues (mean ratio, 0.492; SD, 0.086) compared to the control group (mean ratio, 0.660; SD, 0.089). This impaired collagen synthesis was not observed in animals receiving AMF pretreatment (mean ratio, 0.685; SD, 0.098), supporting its efficacy as a radioprotectant. Additionally, based on the 853/877 cm⁻¹ band intensity ratio (Hyp/Pro ratio), the hydroxylation of proline within collagen was reduced in expanded, irradiated tissues compared to controls. This decrease in the Hyp/Pro ratio was paralleled and supported by the observed reduction in collagen synthesis (Pro+Hyp/Amide-I ratio). This reduction in hydroxylation of collagen proline was mitigated by AMF pretreatment. The 1,656/1,673 cm⁻¹ intensity ratio (α-helix/β-sheet ratio) was evaluated to detect changes in collagen secondary structure, and interestingly, no significant changes in the α-helix/β-sheet ratio were found between irradiated and non–irradiated-expanded tissues. These results suggest that radiotherapy reduces collagen synthesis, but the integrity of collagen secondary structure is preserved.

CONCLUSION: This study further elucidated the mechanism of dermal type I collagen radiation injury. Pathologic changes in the chemical composition of irradiated tissues were detected utilizing Raman spectroscopy. Radiation significantly impaired collagen synthesis, resulting in a marked reduction in the collagen content of irradiated tissues. Amifostine was shown to mitigate these detrimental effects, as AMF pretreatment demonstrated a significant preservation in type I collagen synthesis in this model of irradiated expander-based breast reconstruction. Utilizing AMF as a prophylactic radioprotectant in breast cancer patients has the potential to increase reconstructive options available to patients and their plastic surgeons and improve surgical outcomes in the aftermath of radiotherapy.

Nerve Allografting for Sensory Innervation Following Immediate Implant Breast Reconstruction

Presenter: Ziv M. Peled, MD

Co-Author: Anne G. W. Peled, MD

Affiliation: Peled Plastic Surgery, San Francisco, CA

BACKGROUND: There has been a steady evolution over the past few decades in postmastectomy breast reconstruction techniques. Nipple-sparing mastectomy approaches combined with immediate reconstruction can provide excellent cosmetic outcomes for women, but absent or significantly diminished postoperative breast and nipple/areolar sensation remain major drawbacks. We present a novel technique for implant reconstruction combining several of the latest advances in breast oncologic surgery, reconstructive surgery, and peripheral nerve surgery to achieve what we feel to be an optimal outcome both in terms of esthetics and sensation.

METHODS: Eleven women (21 breasts) underwent nipple-sparing mastectomy and single-stage, direct-to-implant, prepectoral breast reconstruction. During the mastectomy, a careful dissection performed along the lateral aspect of the breast allowed identification and in some cases preservation of the T₄ and T₅ intercostal nerves. In cases where the nerves could be preserved without compromising the oncologic safety of the mastectomy, they were left intact heading into the subcutaneous tissue of the lateral mastectomy skin flap. When preservation was not feasible, neurorization of the nipple/areolar complex (NAC) utilizing allograft coapted from either the T₄ or T₅ lateral intercostal nerves proximally to subareolar nerves distally identified at the completion of the mastectomy. Two-point discrimination was measured preoperatively in all 4 areolar quadrants and the nipple and repeated postoperatively at 3 and 6 months. Sensation to gross, light touch throughout the rest of the reconstructed breast was also assessed (with an added evaluation point of 1 month postoperatively), as was patient satisfaction with their overall breast and NAC sensation.

RESULTS: At the time of submission, 7 women (13 breasts) had ≥6 months of follow-up, with another 3 patients (6 breasts) with over 3 months of follow-up. In patients with ≥3 months follow-up, NAC 2-point discrimination was found to be preserved compared with preoperative values in 16 breasts (84%), was worse in 2 breasts (11%) of patients, and had actually improved in 1 breast (5%). All of the patients in studied had grossly intact sensation to light touch throughout the majority of, if not their entire, reconstructed breasts. All patients reported good satisfaction with their sensory outcomes. None of the women developed hyperesthesia, allodynia, or other symptoms concerning for neuroma formation.

CONCLUSIONS: This initial pilot study demonstrates as a proof of concept that nerve grafting in conjunction and/or careful nerve preservation at the time of nipple-sparing mastectomy with implant-based breast reconstruction is safe and effective, with a nearly 90% rate of preserved sensation postprocedure. Longer follow-up may yield even