Avoiding Tension of Wound Closure in Reduction Mammaplasty and Mastopexy in Previously Irradiated Breasts

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Concerning reduction mammaplasty and mastopexy after radiation therapy for breast conservation therapy, both Spear et al. and Vindigni et al. are to be congratulated for reporting on a clearly challenging surgery. Spear et al. presented a series of 18 patients, who collectively had a complication rate of 28%. Vindigni et al. reported a patient with severe complications who later required free flap repair.

Fortunately, neither set of authors committed the common error of ascribing complications after radiation therapy to microvascular ischemia. In fact, more than 3 decades of research, both laboratory and clinical, into the pathophysiology of radiation therapy effect on human skin indicates that radiated tissues are not ischemic.

On a most basic level, all of us who operate on irradiated skin in the breast and in the head and neck see normal bleeding, certainly not the ischemia of devascularized tissue. Fluorescein given intravenously preoperative to delineate vascularity around radiation-induced ulcers showed complete perfusion of all tissues around the ulcer openings without an ischemic zone. In experimental studies in humans, transcutaneous oxygen partial pressures (TCPO₂) were normal in 88 of 100 patients with therapeutically irradiated skin. Isolated (independent of vasculature) human fibroblasts from radiation ulcer edges had diminished replicative ability in tissue culture. Facelifts, necklifts, and browlifts can be done successfully in therapeutically irradiated faces and necks, procedures that would not be performed in ischemic tissue.

Fat grafts injected into radiation ulcers by Rigotti et al. led to tissue healing; fat grafts would not be expected to survive in truly ischemic tissue.

If radiated human skin is not ischemic, then why does it have an increased risk of surgical complications? The answer most likely lies in the diminished ability of the tissues to respond to surgical injury and to tension on wound closures, probably because of permanent intrinsic fibroblast and stem cell deficiency caused by the radiation therapy.

Spear et al. described their modifications to reduce the likelihood of complications in irradiated tissue: shorter, wider, and broader pedicles and lack of undermining were suggested. Nahabedian emphasized stringent patient selection criteria. While these maneuvers and criteria are helpful, a most important technical factor is to avoid tension on closures of irradiated skin.

Reduction mammaplasties and mastopexies by their nature have some unavoidable wound closure tension, but this tension can be markedly reduced by careful planning. Excess tension in irradiated skin often leads to wound dehiscence. Patients need to be informed that compromises have to be made in surgical design that may produce less than perfect results (like pseudoptosis) to avoid complications.

Reduction of wound closure tension can avoid the devastating consequences of wound dehiscence, with subsequent infection and tissue necrosis in tissues unable to respond with a normal healing response.

Disclosures

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REFERENCES


