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CASE REPORT

Custom Acrylic Compression Prosthetics for Breast Keloids: A Preliminary Case Report

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A 43-year-old nonsmoking white woman with a past medical history significant only for hypothyroidism presented to our clinic requesting a breast augmentation. A circumareolar mastopexy was also recommended for ptosis in conjunction with her implant procedure. Following the initial procedures, she went on to develop periareolar scar hypertrophy and finally keloid formation several months after her revisional surgery. After being treated off and on for 4 years with conservative measures (intralesional triamcinolone injections, steroid-impregnated tape, silicone sheeting, scar revision, intense pulsed light therapy, pulsed-dye laser, and neodymium yttrium-aluminium-garnet laser) with minimal improvement, she was fitted with custom-formed acrylic compression discs. These were worn around the clock for 6 weeks with dramatic improvement in the nodularity, pain, and appearance of the scars. The prosthetics were inexpensive, well tolerated, and effective. This method should be considered for the management of hypertrophic scars and keloids when other modalities have failed. When practical, other areas of the body can be treated as well and have been by the senior author with similar results. These findings should provide a basis for future study.

Keloid scarring is a common and frustrating problem for both patient and physician.¹⁻³ Its formation is multifactorial, owing to both extrinsic (eg, tension) and intrinsic (eg, cytokine regulation) aspects of the wound-healing process.⁴⁻¹² Numerous attempts have been made to solve the keloid dilemma, notably topical steroids, intralesional steroid injections, silicone sheeting, scar compression, scar excision,

topical chemotherapeutic immune modulators, laser therapy, cryotherapy, and radiotherapy, among others; however, no single method has proven completely successful, and recurrence is common.^{1,7,13-22,25} Indeed, management is often fraught with hazards.^{23,24} We present a case of recalcitrant incisional breast keloids following a cosmetic surgery procedure treated with custom acrylic compression prosthetics for 6 weeks.

Case Report

Our patient presented at age 39 for cosmetic breast surgery. She had never smoked. Her medical history was essentially unremarkable except for the fact that she had presented a year previously for acne scar improvement. She had been treated with Accutane in the distant past (greater than 10 years). She underwent scar excision with dermabrasion, and a few of the surgical sites needed revision due to poor wound healing.

On June 1, 2006, she underwent successful bilateral circumareolar mastopexies and a subglandular smooth silicone (400 mL) breast augmentation. She had no sign of poor wound healing at any time during the initial perioperative period. She was treated with postoperative prophylactic antibiotics, and her immediate postoperative course was routine. She was started on paper tape for stabilization of her scars and self-massage therapy to prevent encapsulation of her implanted breasts at approximately 3 weeks.

At postoperative month 6, the patient was started on silicone scar sheeting due to slight scar hypertrophy. At postoperative month 9, she began to have mild capsular contracture, grade II and I½ on the right and left, respectively. She was started on vitamin E and Accolate (zafirlukast) 20 mg orally twice a day and instructed to continue her silicone dressings and breast manipulations. Scar revision due to developing hypertrophy was entertained but postponed at the time. At

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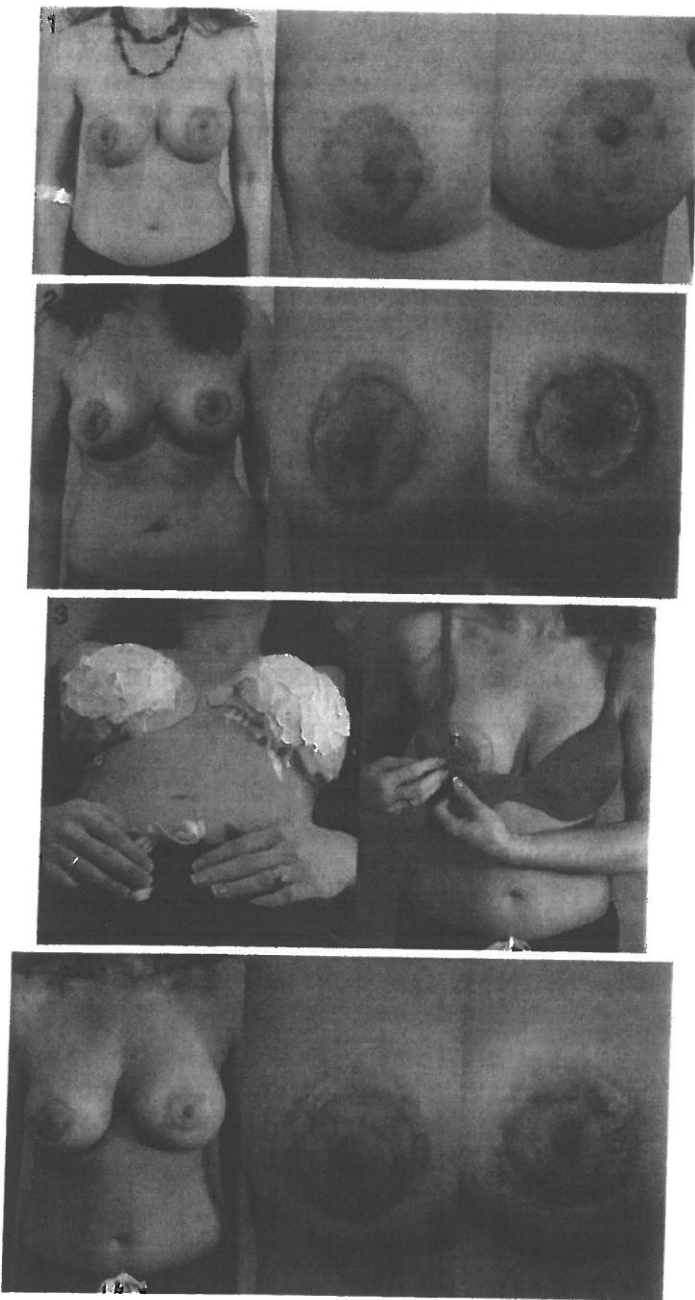


Figure 1. Patient at postoperative month 20. Note the hypertrophic circumareolar scarring.

Figure 2. Patient at postoperative month 22 following revision. Note the scars are more than 1 cm wide.

Figure 3. The moulage was made with plaster, and acrylic prostheses were fashioned to put direct pressure on the scars. They were manufactured as direct negatives of the scars and were worn in specific orientation. Note that the bra is for demonstration purposes only; the patient actually wore them under tight-fitting sports-type garments.

Figure 4. Patient after 6 weeks of the custom compression therapy. Note the improvement in the contour of the scars.

11 months postoperative, some improvement in the breast scars were noted.

At postoperative month 14, her encapsulation had reached a plateau of grade II½ bilaterally. Accolate was discontinued because of length of treatment. She was continued on vitamin E, silicone sheeting, and breast massage.

On January 24, 2008, nearly 20 months postoperative (Figure 1), the patient underwent open capsulotomy and revision mastopexy due to grade III capsular contracture and hypertrophic circumareolar scarring. At 6 weeks postoperative, she was noted to have exposure of some Vicryl (polyglactin 910) suture from the 8 to 12 o'clock positions of her left nipple areolar complex, and they were removed. At that time, she was exhibiting periareolar hypertrophic scarring bilaterally, but no reencapsulation was noted. She was started on silicone sheeting, as well as breast massage, Accolate, and vitamin E.

Despite early intervention, the scars had extended beyond their original borders and demonstrated keloid characteristics by 4 months after the revisional surgery. Kenalog (triamcinolone) 10 mg/mL was injected into the scars at this point, and silicone sheeting was continued. Kenalog 20 mg/mL was injected intraleisionally on postoperative month 5 and Kenalog 40 mg/mL on postoperative month 6 following the revision. Cordran (flurandrenolide) tape was also initiated at that time.

Over the next several months, she had various treatments to the scars, including intense pulsed light therapy, neodymium yttrium-aluminium-garnet laser, pulsed-dye laser, intralesional steroids, topical steroid tape, and silicone sheeting. By postoperative month 22, her scars were greater than 1 cm wide bilaterally, with painful nodularity and an unsightly contour that was visible through her clothing (Figure 2).

On February 2, 2010, 24 months after revisional surgery, she was brought to the clinic. Plaster impressions were made of each breast scar, and an acrylic disc negative was created to put direct pressure on the scars under a tight-fitting bra (Figure 3). Ventilation holes were added for patient comfort. Cost to the patient was less than \$125 for the plaster casting and disc construction. She was instructed to wear the prostheses around the clock except to shower. Six weeks into the therapy, notable improvement had been made in the nodularity, pain, and appearance of the scars. Patient satisfaction was noted to be high, and the devices were well tolerated.

Results

Our patient demonstrated hypertrophic scarring after cosmetic breast surgery and underwent scar revision approximately 2 years after her original procedure. She then developed keloid scarring, which was treated early and aggressively for the following 2 years with numerous proven modalities, including silicone sheeting, steroid injections, topical steroids, and laser therapy, with minimal to modest improvement. With just 6 weeks of wearing the custom-made acrylic compression prostheses, she showed dramatic improvement in nodularity, pain, and appearance of the scars, the degree of which was not observed in the previous 24 months of intervention (Figure 4). The patient stated that she wore the prostheses constantly, even while sleeping, and she found them to be unnoticeable under a tight-fitting bra. She found them visible only under very thin blouses, and her only complaint was mild dermatitis when the weather was hot.

While this is a preliminary case report for breast scars in this Caucasian female, the results appear to be acceptable to date and this treatment has offered us a viable alternative when all others have failed to make a difference in her scar modulation.

Discussion

One of the principle goals in cosmetic surgery is to create as inconspicuous a scar as possible. When faced with the problem of excessive scar formation, the goal becomes damage control. In this case, the senior author was faced with keloid scarring in a Caucasian breast procedure, which was an extremely unusual outcome. Even though her scar(s) are much more acceptable, the plan at this point if she does not reencapsulate is to reexcise her now flattened but widened scars and create new custom prostheses for the new incisional scars before they have a chance to become hypertrophic again.

Compression therapy is an established adjunct to keloid management of the pinna/earlobe^{19,21}; however, it may not be easily employed for another part of the body. This method of custom acrylic plates pressed against the scar was simple, inexpensive, and well tolerated and has been effective for this patient's breast scars. Trials could be designed to find the best shape, material, and length of time employed.

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