The Benefit of Acellular Dermal Matrix Placement in Primary Breast Surgery May Outweigh the Cost in Patients at High Risk of Capsular Contracture

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Wagner and Mirhaidari[1] recently demonstrated a low rate of capsular contracture (CC) recurrence in a series of 43 patients (75 breasts) who underwent revisional surgery with the SPICES protocol—which includes placement of Strattice Reconstructive Tissue Matrix (Allergan, Irvine, CA), implant exchange, capsulectomy, and site exchange (as needed)—to manage CC secondary to breast augmentation. The placement of Strattice, a porcine acellular dermal matrix (ADM), was regarded as a key step in the SPICES technique because a separate group of 24 patients (38 breasts) who underwent a procedure to address CC that lacked ADM placement, but was otherwise similar, had a significantly higher rate of CC recurrence (15.8% vs 2.7%, $P = 0.02$).[1]

Wagner and Mirhaidari[1] mentioned that several patients who learned of the option for ADM-assisted revisional breast surgery to address CC inquired about receiving ADM as part of the primary breast augmentation in an attempt to prevent, rather than treat, this complication—possibly avoiding the aesthetic and functional consequences of CC and the cost and inconvenience of a revisional operation. The authors pointed out potential objections to routine placement of ADM in primary breast augmentation, including a cost increase of approximately $3200 per bilateral procedure, roughly equal to a second set of implants. However, for certain patients, the money may be well spent.

If patients at increased risk of CC could be identified preoperatively and selectively offered ADM placement as part of the primary breast surgery, it might be possible to decrease the overall rate of CC without asking all patients to incur an added expense. Although CC is idiosyncratic, I suggest that inadequate soft-tissue support may be a risk factor for this complication. In my surgical career, I have noticed that patients with low-quality breast structure—including those who are older, have experienced substantial weight loss, or have a history of pregnancy and breastfeeding—seem to be at higher risk of experiencing CC. These patients can be identified preoperatively by performing a detailed patient history and a thorough physical examination, and they may be more likely to benefit from implantation of a scaffold or matrix material to stabilize the breast prosthesis.

In 2013, I described a link between poor structural support of the breast and CC in my patient practice.[2] I evaluated 3 patients with low-quality soft-tissue support and found that prophylactic Strattice placement in the primary operation resulted in no CC or any other complication for a mean of 18 months of monitoring.[2] Although 3 patients do not constitute a sufficiently large or controlled clinical population from which to draw conclusions, I believe that deficient soft-tissue structure is a potential risk factor for CC that has not received enough attention.

Wagner and Mirhaidari[1] described findings in 4 patients who received Strattice as part of the primary breast enhancement and had no complications, including CC, for 48 to 60 months of follow-up. These authors also demonstrated

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results of no complications in 5 patients who received prophylactic Strattice placement in the unaffected contralateral breast as part of bilateral revisional surgery (SPICES) to treat unilateral CC.[1] Hester et al[3] showed that incorporating Strattice in a subgroup of patients who received primary breast augmentation or mastopexy/augmentation (49 patients [84 breasts]) resulted in no CC for 3 to 24 months of monitoring. These findings are promising although limited in interpretability because of small sample sizes.

ADM may help prevent CC by enhancing lower-pole mechanical support and stability to accommodate the additional weight of the implant or by interrupting continuity of the capsule, thereby hindering contractility. Recently, I have transitioned from placing ADM to utilizing the SERI Surgical Scaffold (Sofregen, Inc., Medford, MA), a bioresorbable, silk-derived fibrous netting. I have found SERI to be more pliable, less palpable, and more consistently integrative than Strattice (or other ADM materials). In a prospective, multicenter study by Karp et al[4] in which 103 patients (161 breasts) received SERI during stage 1 of 2-stage breast reconstruction, results through 2 years of monitoring showed high levels of investigator and patient satisfaction and soft-tissue stability of the lower breast, with SERI retention in 98.8% of breasts.

I employ a periareolar approach for its superior visualization of the chest wall anatomy, access to the entirety of the breast pocket, and concealed scar. Visualization through a periareolar incision is akin to viewing a room from a centralized point on the ceiling. In more than 20 years of utilizing this technique, I have found that the rate of CC in my practice has been low and comparable with the rates of colleagues who perform augmentation through an inframammary incision. After traversing the subareolar tissue, the areolar plane between the capsule and the overlying soft tissue is opened. Dissection is continued to the inframammary fold caudally and to the chest wall medially and laterally. I insert the SERI scaffold between the capsule cephalically and the native soft tissue caudally, thereby "sandwiching" the SERI material with vascularized tissue (Figure 1). The matrix is maintained in close tissue contact under the weight of the implant, encouraging revascularization.

Wagner and Mirhaidari[1] primarily placed Strattice in revisional cases, but they addressed the possibility of preempting CC with ADM implantation in primary breast surgery. The current article is intended to stimulate discussion and encourage further research into the feasibility of placing a scaffold or matrix material in certain cases of primary breast augmentation. To further explore this idea, an assessment of the number needed to treat and a cost-benefit analysis are warranted. The identification of at-risk patients most likely to benefit from ADM placement may be challenging, but my preliminary findings[2] and surgical experience suggest that structural insufficiency of the mammary gland is a possible risk factor for CC. Although implantation of a synthetic scaffold or ADM has the disadvantage of added upfront cost, certain patients may regard this as a worthwhile safety measure to forestall the expense and downtime of a revisional procedure.

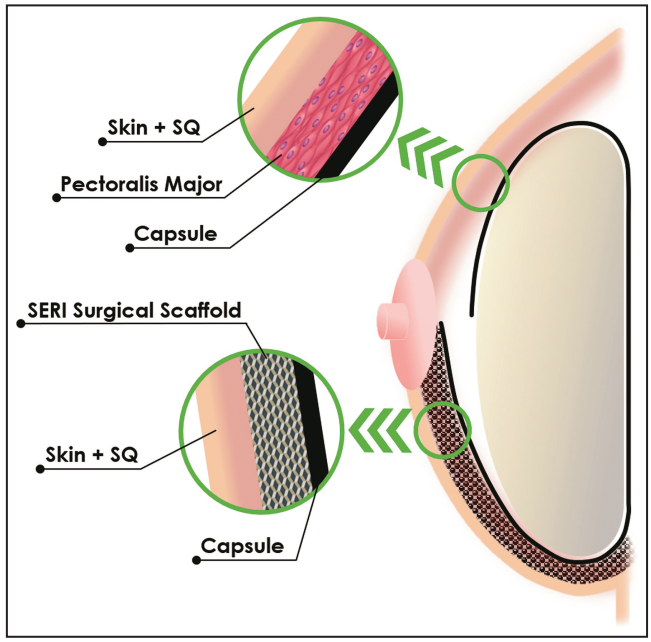

Figure 1. My "sandwich" technique of positioning the SERI Surgical Scaffold in the implanted breast. SQ, subcutaneous.

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