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The *Journal* requests that individuals submit no more than five (5) letters to *Plastic and Reconstructive Surgery* in a calendar year.

Letters

Prepectoral Breast Reconstruction

Sir:

We had the great pleasure of reading the interesting article by Ter Louw and Nahabedian entitled "Prepectoral Breast Reconstruction,"[1] and we congratulate the authors on their study. Implant-based breast reconstruction continues to be the technique used most for postmastectomy reconstruction worldwide. Traditional techniques for partial or complete submuscular coverage in prosthetic breast reconstruction are an ideal option for many patients and produce consistent outcomes with excellent safety profiles. The addition of acellular dermal matrix to these procedures has made excellent aesthetic results more consistently achievable in many cases, maintaining an equivalent safety profile.[2]

However, the elevation, disinsertion, and stretching of the pectoralis major muscle, and in some cases the serratus anterior muscle, are associated with the potential for increased clinical side effects.[3] These include greater risk of animation deformity and increased loss of strength. Immediate prepectoral breast reconstruction, with placement of a tissue expander above the pectoralis muscle, might reduce the incidence of these clinical morbidities. The elimination of muscle dissection has made the immediate postsurgical recovery period and the expansion process easier for patients to tolerate. With prepectoral breast reconstruction, it is possible that patients may exhibit less overall discomfort associated with surgical recovery, relative to submuscular reconstruction, because of the elimination of pectoralis major muscle dissection, disinsertion, and stretching.

First and foremost to perform prepectoral breast reconstruction, the mastectomy skin flaps must be viable and vascularized. The assessment is made mainly by visual means, as significant skin compromise is usually evident. However, indocyanine green angiography can also be used.

Experience has shown that thin mastectomy skin flaps can still allow for prepectoral breast reconstruction, provided that they maintain vascularity and none of the skin is burned or excessively ischemic. In patients with thin and fully viable flaps, with no exposed dermis on the underside, it is our preference to expand them with little to no volume at the time of intraoperative expander placement, and wait 3 weeks before starting expansion. At this point, the skin flaps have healed and can be safely expanded and stretched by the prepectoral tissue expander.

Certain oncologic considerations must also be made when considering prepectoral breast reconstruction. For us, one absolute oncologic contraindication for prepectoral breast reconstruction is a patient with direct chest wall invasion of the breast tumor. In addition, patients with tumors within 0.5 cm of the chest wall should also be considered for submuscular rather than prepectoral breast reconstruction. In these patients, with a higher risk of chest wall recurrence, future surveillance would be safer and easier with a pectoralis muscle directly under the skin rather than under a prosthetic device. Other relative oncologic contraindications to prepectoral breast reconstruction include patients with stage 4 or inflammatory breast carcinoma.

In our experience, patients with planned postmastectomy radiation therapy are candidates for prepectoral breast reconstruction. It appears that prepectoral breast reconstruction patients may benefit from the protective effect of acellular dermal matrix.[4,5] Another potential benefit of prepectoral breast reconstruction may be a reduction in capsular contracture rates, as the implants are almost completely enveloped in acellular dermal matrix rather than autologous muscle. The ability of acellular dermal matrix to reduce the capsular fibrosis and contracture rates is well known.[6,7]

One potential clinical risk of prepectoral breast reconstruction is a higher rate of visible rippling over the permanent implants, given their thinner upper pole coverage, compared with submuscular reconstruction. In addition, it is important to underfill the tissue expanders relative to the anticipated final implant size. This allows for placement of a larger permanent implant into a smaller/tighter breast pocket. In this way, there is no redundant or underfilled skin in the final reconstructed breast, and thus rippling is less likely. Furthermore, the lack of animation deformity creates a nicer appearance of the prepectoral breast in all phases of patient activity and chest wall muscle activation.

In conclusion, future directions of analysis into prepectoral reconstruction should focus on larger series in the setting of radiotherapy, to assess outcomes in this setting. Furthermore, longer follow-up should define the actual rates of capsular contracture in these patients. We recognize that longer follow-up could also further define the success of this technique in providing adequate soft-tissue support for implants over time, especially in those patients with larger volume implants.

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DISCLOSURE

The authors have no financial interest to declare in relation to the content of their communication.

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Reply: Prepectoral Breast Reconstruction

Sir:

I would like to thank Drs. Bonomi, Sala, and Cortinovis for their insightful comments and reply to our article entitled "Prepectoral Breast Reconstruction."[1] I could not agree with them more, as they have touched on the relevant issues, concerns, risks, and benefits associated with prepectoral breast reconstruction. Although there are surgeons that perform prepectoral breast reconstruction without the use of an acellular dermal matrix, I agree that acellular dermal matrix has provided additional benefit by increasing soft-tissue support and reducing the incidence of capsular contracture. In our previous reconstructions without acellular dermal matrix, overfilling the tissue expander was the rule to ensure that we had enough skin coverage to achieve ideal breast aesthetics; however, with the addition of acellular dermal matrix, our approach is to underfill the tissue expander and place a larger permanent implant. This is now possible because of the improved soft-tissue compliance and the increased capacity of the periprosthetic space. Our experience with prepectoral reconstruction has also demonstrated less pain and discomfort compared with subpectoral placement of devices and total elimination of animation deformity associated with contraction of the pectoralis major muscle. The elimination of muscle spasm associated with elevation of the pectoralis major muscle has facilitated the recovery process by reducing postoperative pain. The addition of enhanced recovery after surgery protocols using liposomal bupivacaine has also been very effective in reducing postoperative pain and facilitating the transition to outpatient surgery.

With regard to technical issues, we agree completely that perfusion rather than thickness of the mastectomy skin flap is the critical factor governing success with prepectoral reconstruction. The importance of the breast surgeon performing the mastectomy cannot be overemphasized. Perfusion assessment is important whether using specific devices such as indocyanine green or relying on clinical acumen. Many oncologic physicians in the United States have expressed the same concerns with regard to tumor location as a criterion for prepectoral breast reconstruction. We agree that tumors that are within 5 mm of the chest wall or invading the chest wall are contraindications to prepectoral breast reconstruction because of the possible risk of compromised surveillance. It has also been our