

Revisiting Prepectoral Breast Augmentation: Indications and Refinements

Hyung-Bo Sim, MD[®]

Aesthetic Surgery Journal
2019, Vol 39(5) NP113–NP122
© 2018 The American Society
for Aesthetic Plastic Surgery, Inc.
Reprints and permission: journals.
permissions@oup.com
DOI: 10.1093/asj/sjy294
www.aestheticsurgeryjournal.com

OXFORD
UNIVERSITY PRESS

Abstract

Background: Prepectoral breast reconstruction is receiving renewed attention as a viable alternative to retropectoral reconstruction. Prepectoral breast augmentation needs to be reappraised, because patients increasingly demand safer and less invasive procedures with a shorter recovery period.

Objective: This study aimed to evaluate prepectoral breast augmentation combined with a microtextured prosthesis to determine whether it could be a useful alternative to retropectoral augmentation.

Methods: This study included 76 women (152 breasts) who were indicated for primary breast augmentation. The inclusion criterion was a pinch test result of more than 3 cm at the upper pole of the breast. A total subfascial dissection was performed with endoscopic assistance. Microtextured implants were placed through an axillary approach in the subfascial space.

Results: The mean follow-up period was 12 months (range, 6–23 months). The mean implant volume was 278.1 mL (range, 185–360 mL). Autologous fat grafts were applied in 12 patients. No patients developed seroma, capsular contracture, or malposition during the follow-up period. Two patients expressed concerns of minor contour visibility, but no patients required revisional surgery.

Conclusions: The drawbacks of prepectoral implant placement were sought to be managed by fascial coverage and microtextured prostheses. Although the follow-up duration was short, major complications were not encountered with Motiva Ergonomix SilkSurface implants. Therefore, prepectoral augmentation with microtextured prostheses should be reconsidered as a potential alternative to retropectoral methods because of the recent advances in surgical techniques and device technology.

Level of Evidence: 4

Editorial Decision date: October 9, 2018; online publish-ahead-of-print October 29, 2018.



The ideal location for breast implants during reconstruction has become a topic of discussion. For many years, plastic surgeons have placed the prosthesis in the retropectoral position. However, recent evidence has suggested that prepectoral placement might have specific advantages such as less movement, better position on the chest wall, and less discomfort due to the absence of muscle spasms.¹

In aesthetic breast surgery, prepectoral implant placement has generally been considered to yield unsatisfactory outcomes, including poor shape, severe rippling, and high rates of capsular contracture.^{2–6} Several prerequisites are necessary to achieve successful prepectoral augmentation, such as selecting appropriate patients with

enough soft tissue padding to cover the prosthesis, creating the correct plane for implant placement,^{6–8} and choosing a suitable breast implant for the prepectoral space. Especially for Asian patients with slim body habitus and tight skin, finding the right indications is critical for successful outcome.

Dr Sim is a Clinical Assistant Professor, Department of Plastic Surgery, Soonchunhyang University Hospital, Seoul, Korea.

Corresponding Author:

Dr Hyung-Bo Sim, Department of Plastic Surgery, Soonchunhyang University Hospital, 59, Daesagwan-ro, Yongsan-gu, 04401 Seoul, Republic of Korea.

E-mail: wsimwww@gmail.com

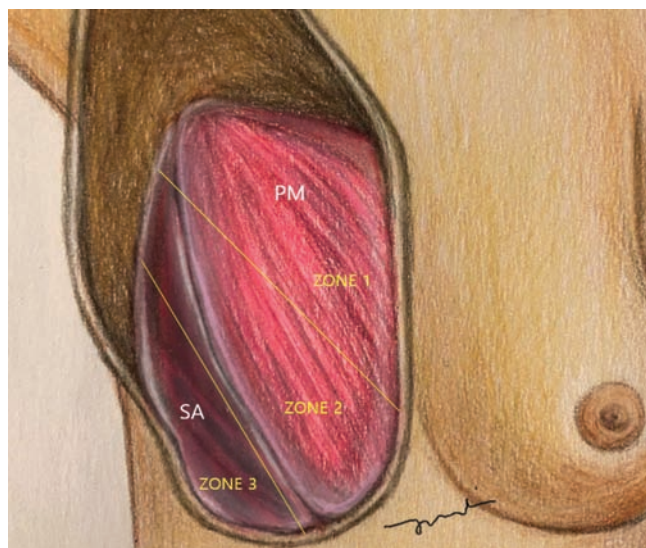


Figure 1. Three zones of prepectoral dissection. A clockwise sequence in the right breast. Zone 1 is used for establishing the medial border. Zone 2 is used for securing the inferior border. Zone 3 is used for connecting the superficial and deep fascia in the inferolateral portion. PM, pectoralis major; SA, serratus anterior.

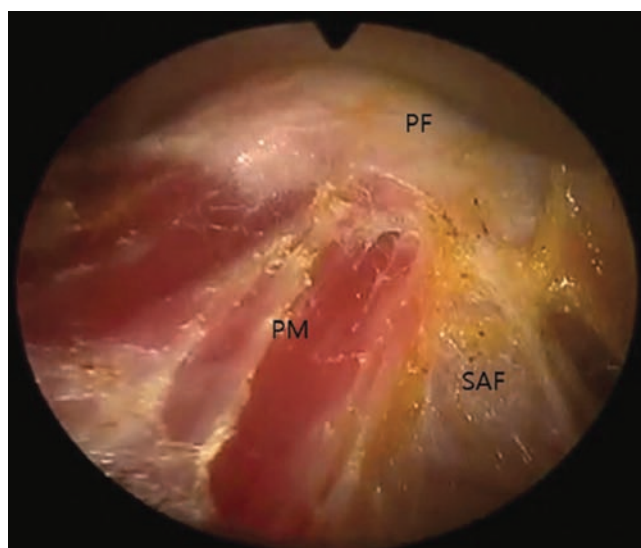


Figure 2. At the inferolateral end of the pectoralis major, there is usually adhesion between the fascia and deep dermis that should be detached to allow inferior movement of the implants. PF, pectoralis fascia; PM, pectoralis major; SAF, serratus anterior fascia.



Video 1 Watch now at <https://academic.oup.com/asj/article-lookup/doi/10.1093/asj/sjy294>



Video 2 Watch now at <https://academic.oup.com/asj/article-lookup/doi/10.1093/asj/sjy294>

The aim of this study was to evaluate prepectoral breast augmentation combined with a microtextured prosthesis to determine whether it could be an alternative option to retropectoral augmentation. This paper sought to study the following queries: (1) What refinements are necessary to overcome the drawbacks of prepectoral augmentation? (2) Is using a microtextured implant for prepectoral placement feasible in terms of patient safety? In previous studies involving microtextured prostheses, the retropectoral space has been made via an inframammary incision.^{9,10}

METHODS

A prospective study involving 76 patients (152 breasts) who underwent transaxillary prepectoral augmentation with microtextured implants from June 2015 to May 2018 was conducted. All patients included in the study underwent primary breast augmentation and had enough soft tissue padding. The criteria for the procedure were the patient's willingness to have a scar on the armpit and a pinch test result of 3 cm or more at the upper pole. Those with a pinch test result of < 3 cm at the upper pole of the

Table 1. Types of Motiva Ergonomix SilkSurface Devices Implanted in the Patient Series

Volume (mL)	Device style	No. of breasts
185	Mini	3
220	Mini	4
245	Demi	22
265	Demi	41
285	Demi	40
300	Demi	21
320	Demi	14
335	Full	2
340	Demi	3
355	Full	1
360	Demi	1

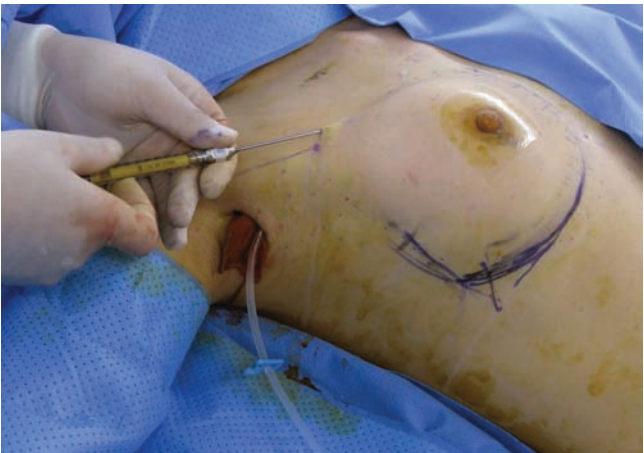


Figure 3. A relatively small volume of fat was enough to alleviate contour visibility in the superior and medial portions.

breast and <4 mm at the inframammary fold (IMF) level were strictly excluded. Patients with breast ptosis and inferior pole constriction were also excluded.

The surgeon counseled patients about the possible surgical outcomes, and written informed consent was obtained from all participants. The dimensions of the implants were determined preoperatively by measuring the width of the base of the breast and the individual body morphology. The study was conducted in accordance with the Declaration of Helsinki and good clinical practice guidelines.

Operative Technique

Under general anesthesia, the arms were abducted at a right angle and a 3-cm incision was marked behind

Table 2. Comparison of Techniques and Complication Rates in Primary Breast Augmentation With Motiva Ergonomix SilkSurface Implants

	Sforza et al ⁹	Huemer et al ¹⁰	Current study
No. of patients	1765	100	76
Implantation plane	Retropectoral	Retropectoral	Prepectoral
Surgical approach	IMF	IMF	TA
Type of complication	No. of patients		
Seroma	0	0	0
Infection	0	0	0
Hematoma	0	1	0
Malposition	0	4	0
Capsular contracture	0	1	0
Contour visibility	ND	ND	2

IMF, inframammary fold; ND, not determined; TA, transaxillary.

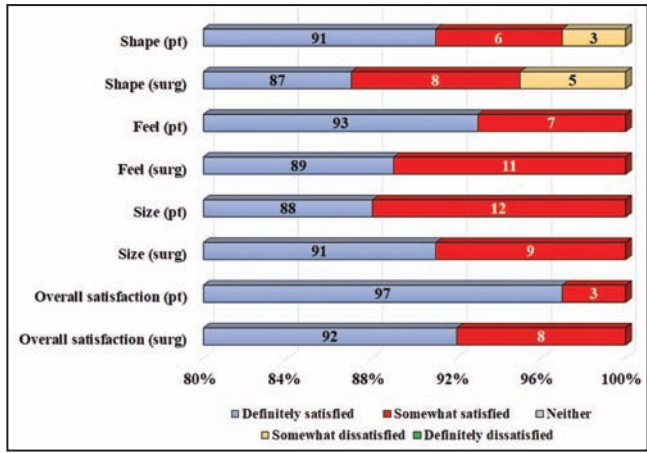


Figure 4. Survey results at 1 year postoperative. pt, patient survey; surg, surgeon survey.

the contour of the pectoralis major along the pre-existing axillary folds. The posterior end of the incision was marked as high as possible within the follicular region.

After a brief subcutaneous dissection toward the lateral border of the pectoralis major, the fascia was opened, and subfascial dissection was carried out under direct vision. When direct vision was no longer possible, an endoscope (Richard Wolf GmbH, Knittlingen, Germany) was introduced to continue the dissection. The entire surgical procedure was performed utilizing sharp electrocautery dissection with direct endoscopic visualization. The prepectoral space was divided into 3 zones, and each zone was used for a certain task (Figure 1).

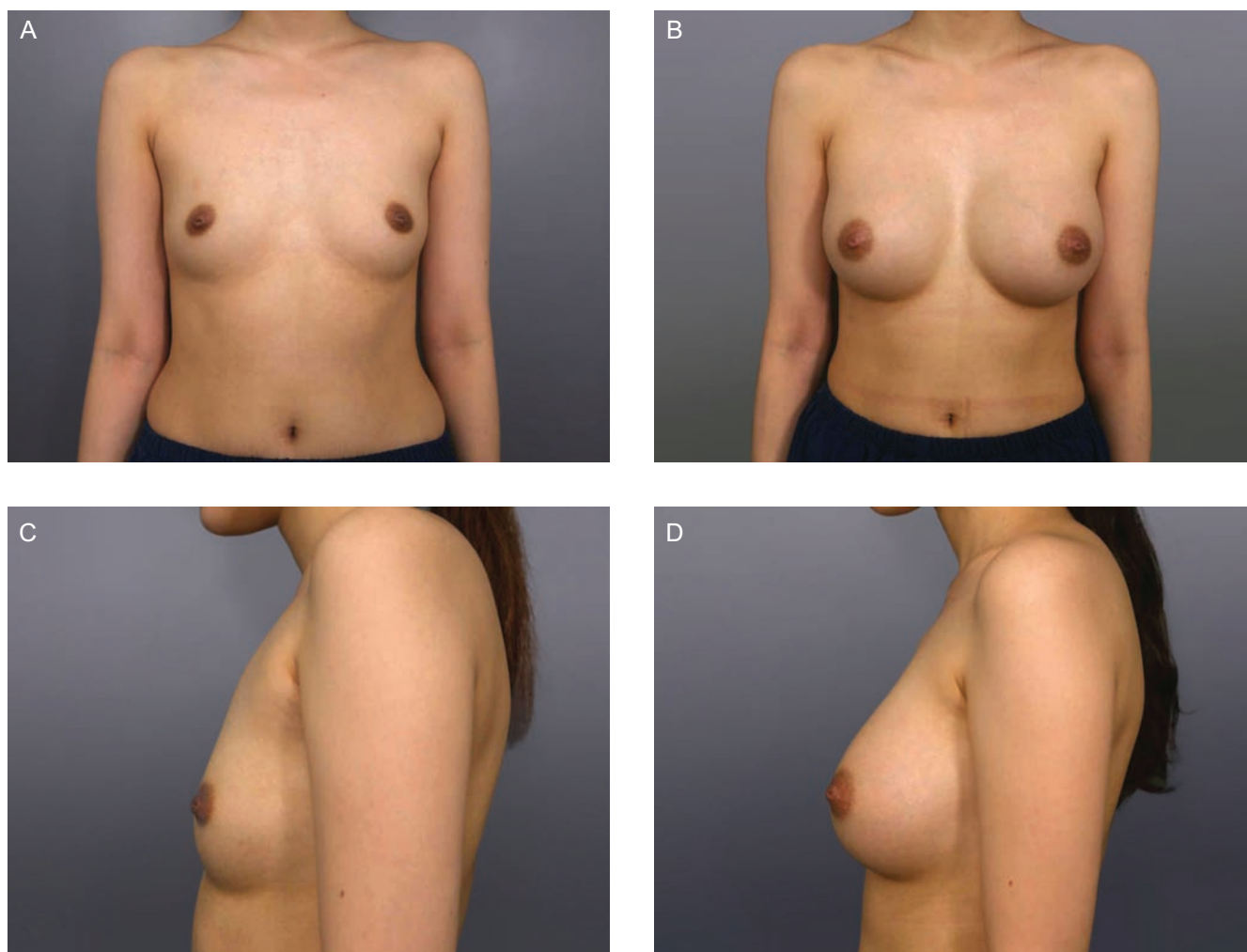


Figure 5. This 33-year-old woman underwent transaxillary prepectoral breast augmentation employing a Motiva Ergonomix implant with a volume of 340 mL. Views obtained (A, C) preoperatively and (B, D) 20 months postoperatively.

Zone 1: Superior and Medial Areas

Under magnification, electrocautery dissection was carefully performed, and the glistening pectoral fascia overlying the yellow subcutaneous fat was preserved.

At first, dissection was performed from the superolateral area to the superomedial area and proceeded to the medial border in a clockwise manner on the right breast. When necessary, parts of the muscle bundles were intentionally attached to the fascia. The fascial structures were elevated from the underlying exposed muscle fibers as much as possible to create an envelope thick enough to cover the implants. Excessive medial dissection was prevented to leave an intermammary distance of at least 3 cm (Video 1, demonstrating subfascial dissection).

Zone 2: Inferomedial and Inferior Areas

At the inferior border, the dissection was consistently continued downward to the predetermined IMF markings.

However, in cases with a high costal origin, the dissection plane should be carefully maintained under the fascia to retain envelope thickness (Figure 2).

Zone 3: Inferolateral Area

Usually, the pectoral fascia enclosing the pectoralis major is not in the same plane as the deep fascia of the serratus and external oblique muscles. To create total subfascial coverage, the superficial fascia of the serratus anterior was elevated to be connected with the pectoral fascia. Blunt forceful dissection in this area was strictly avoided, which results in damage to the serratus muscle and the intercostal bundles, and the natural curvature of the inferolateral breast was likely to be destroyed (Figures 1 and 2).

After hemostasis, the contour was evaluated with the aid of a disposable sizer to determine whether an adjuvant fat graft would be necessary. Most fat was harvested from the abdomen and prepared with Puregraft (Cytori

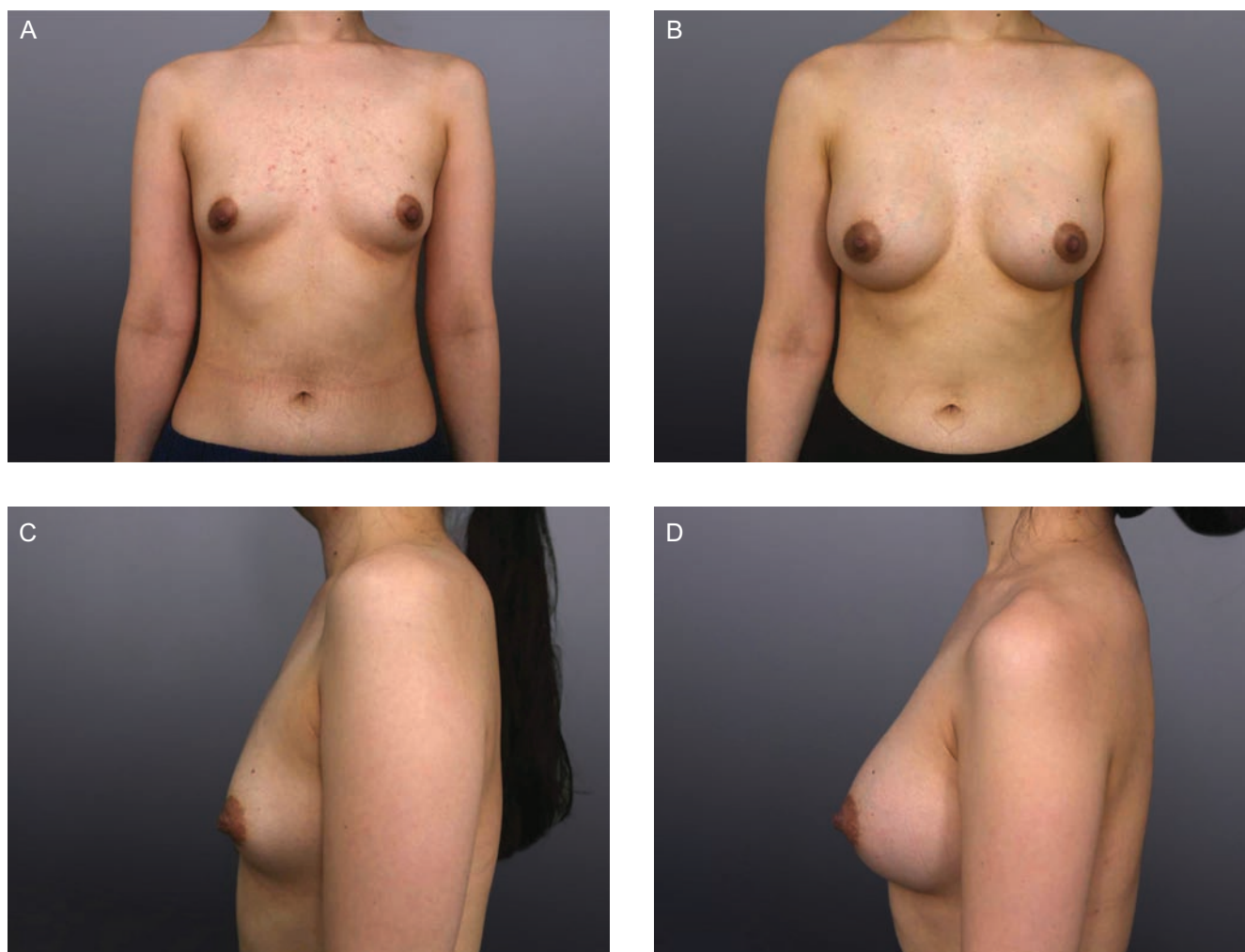


Figure 6. This 27-year-old woman underwent transaxillary prepectoral breast augmentation employing Motiva Ergonomix implants with volumes of 285 mL and 245 mL. Views obtained (A, C) preoperatively and (B, D) 12 months postoperatively.

Therapeutics, Inc., San Diego, CA). A small amount of fat was infiltrated in the subcutaneous layer of the superior and medial portions of the breast (Figure 3). After removing the sizer, the pocket was irrigated with a solution of povidone-iodine, gentamicin, 10% tranexamic acid, and normal saline.^{11,12}

Microtextured gel implants (Motiva Ergonomix SilkSurface, Establishment Labs, Alajuela, Costa Rica) were inserted through sleeves (Keller Medical Inc., Stuart, FL) (Video 2, demonstrating a funnel through the axilla). Because of the soft, resilient nature of microtextured implants, a 3-cm incision in the armpit was enough to accommodate a volume up to 360 mL. The fascial layers were closed, followed by subcutaneous and dermal closure with absorbable sutures and skin adhesives.

A surgical bra and an ACE bandage (3M, Maplewood, MN) were applied over the armpit area. All patients underwent surgery during the day and were discharged 3 to 4

hours after completion. Patients were allowed to shower 2 days postoperatively, and light activity was resumed immediately. ACE bandages (3M) were applied for 2 weeks. Generally, it was possible for the patients to perform weight-bearing exercises of the upper limbs starting 4 weeks postoperatively. At 6 months and 1 year after surgery, ultrasound evaluation was performed to observe any periprosthetic fluid collection.

RESULTS

One hundred fifty-two breast implants were applied through the axillary route. The demographic data of the women were as follows: mean age, 27.7 years (range, 21-52 years); mean height, 165.2 cm (range, 152-178 cm); mean weight, 53.4 kg (range, 46-71 kg); mean body mass index, 19.5 kg/m² (range, 17.1-27 kg/m²), and all of Asian ethnicity. All implants were round gel implants (mean

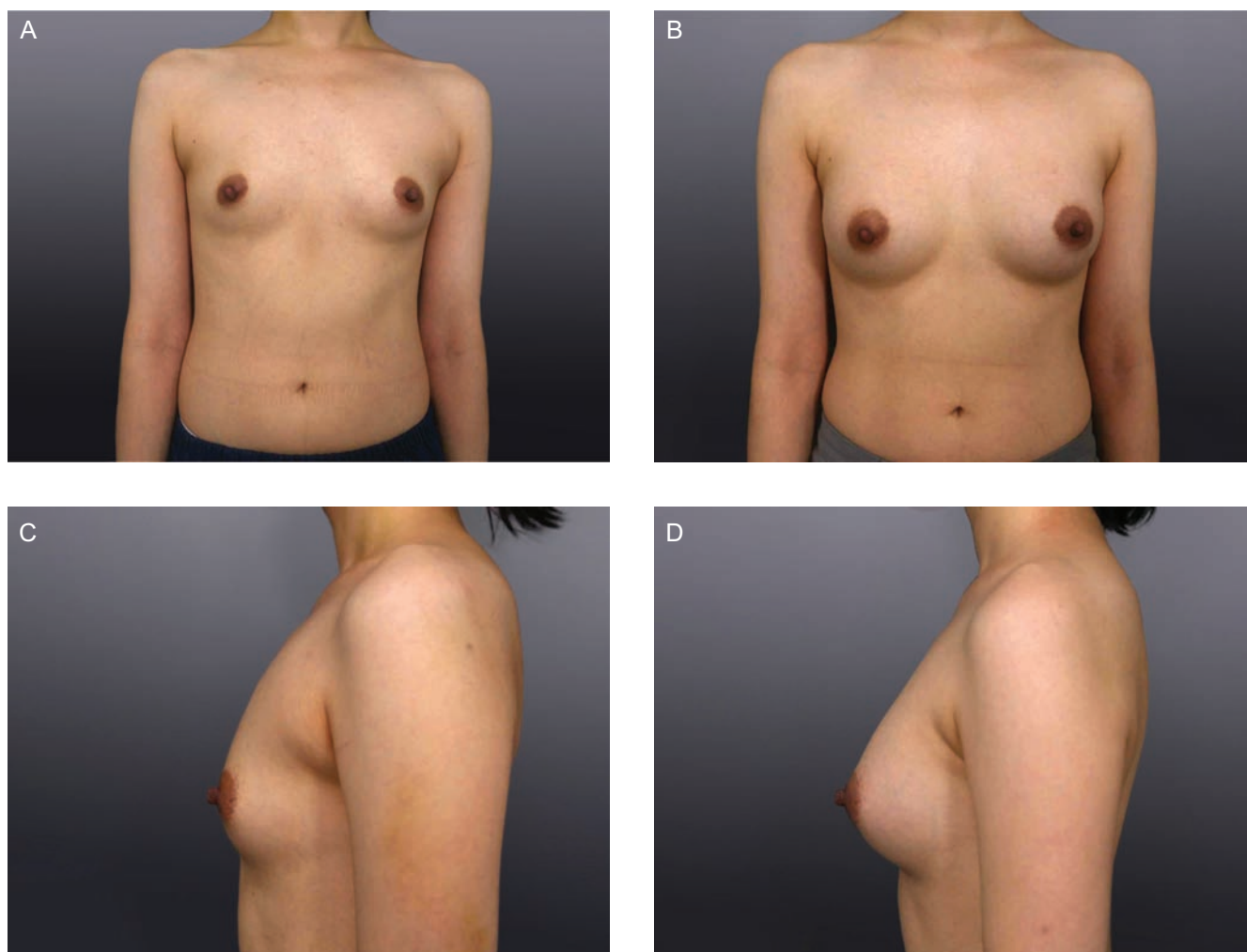


Figure 7. This 24-year-old woman underwent transaxillary prepectoral breast augmentation employing a Motiva Ergonomix implant with a volume of 245 mL with simultaneous autologous fat grafting (14/8 mL). Views obtained (A, C) preoperatively and (B, D) 14 months postoperatively.

volume, 278.1 mL; volume range, 185-360 mL) with a microtextured surface (Motiva Ergonomix SilkSurface) (Table 1).

An adjunctive autologous fat graft was used for 12 patients (15.8%). The average infiltration volume was 14 mL (range, 8-35 mL).

The mean follow-up period was 12 months (range, 6-23 months). No major complications such as hematoma, seroma, infection, implant rupture, or malposition were observed. No breast capsular contracture was observed during the follow-up period. No patient reported severe pain postoperatively, and narcotics were not used in the recovery rooms.

Patient and surgeon satisfaction were measured on a 5-item Likert scale. The percentage of satisfaction evaluated by 4 surgeons and by the individual patient after the procedure at 1 year is shown in Figure 4. Overall satisfaction

of both patients and surgeons was high, and all patients were happy with the size and feel of their breasts. Only 2 patients (3%) were dissatisfied with contour visibility, but none required additional surgery during the follow-up period (Figures 4-7).

DISCUSSION

Prepectoral breast reconstruction has reemerged as an alternative to the partial and total muscle coverage methods. Recent advancements in plastic surgery, including the use of acellular dermal matrices, autologous fat grafting, improved breast implants, and improved mastectomy techniques, have enabled plastic surgeons to revisit the prepectoral space.¹³ Prepectoral breast augmentation needs to be reappraised because patients increasingly demand less painful procedures and a shorter recovery period, and

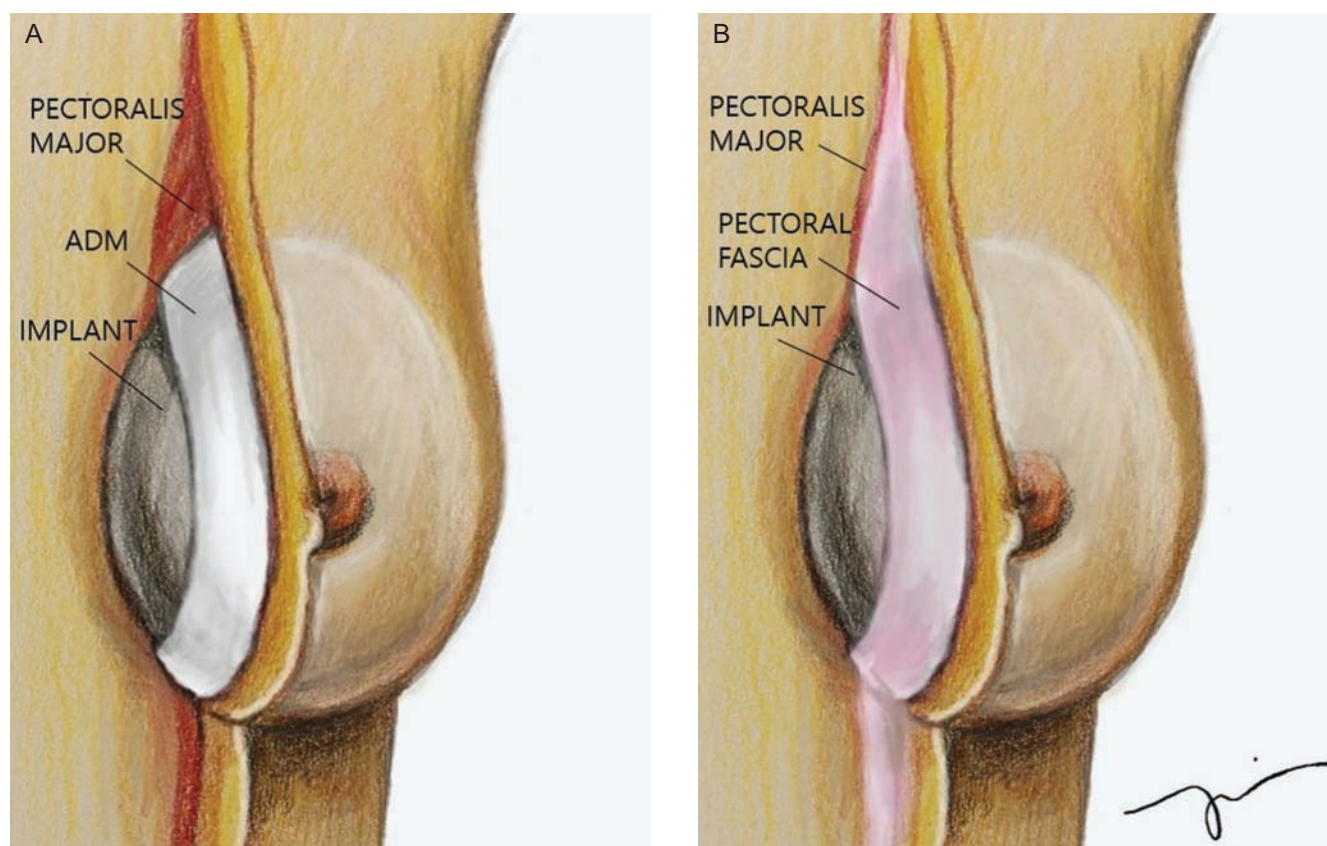


Figure 8. (A) During prepectoral placement of the prostheses, an acellular dermal matrix (ADM) covers the implant for breast reconstruction. (B) During prepectoral breast augmentation, the pectoral fascia covers the implant, which has the advantages of avoiding the submuscular position and providing adequate support.

more viable and healthier skin flaps are encountered during aesthetic breast augmentation.

The prepectoral implant position is less invasive and less painful for patients and provides an optimal anatomical position for the human breast.^{13,14} Prosthetic reconstruction with prepectoral implant placement was associated with less animation deformity due to fewer muscle spasms, lower chance of implant displacement, and narrower intermammary distance.^{1,15,16} However, several drawbacks had been pointed out: (1) weak soft tissue coverage over the prosthesis; (2) poor contour; and (3) higher capsular contracture rate.^{3-6,17}

To compensate for the soft tissue deficit, the implant was covered with acellular dermal matrices during prepectoral implant reconstruction. However, during aesthetic prepectoral augmentation, the implant was covered with the pectoral fascia instead of acellular dermal matrices in this study (Figure 8). When it was necessary, additional autologous fat graft would help to mitigate contour visibility. Subfascial implant placement has resulted in better upper pole contour than subglandular placement.¹⁸⁻²⁰ In addition, subfascial breast augmentation showed a capsular contracture rate that was comparable to that of

submuscular augmentation and allowed for more padding over the prosthesis than the subglandular procedure, including a 2% capsule rate at 6 years and a 2.3% capsule rate at 3 years.^{20,21} Many articles have reported that the subfascial plane has the advantages of avoiding the submuscular position and providing adequate support.^{18,19,22-24} The pectoral fascia is a dense connective tissue, and its integrity can be preserved during dissection. Although the pectoral fascia is very thin (0.2-1.14 mm), it is dense and can provide more soft tissue and a healthy vascularized environment for an implant.²⁵

Macrot textured breast implants have been criticized because of their connection with breast implant-associated anaplastic large-cell lymphoma (BIA-ALCL) and, of late, are hardly recommended for either aesthetic and reconstructive breast surgery. Growing evidence supports a multifactorial cause, including bacterial component, genetic predisposition, and the suggestion that implants with a macrot textured surface may readily trigger BIA-ALCL.^{6,17,26} Furthermore, public awareness of these issues has increased following a safety communication warning from the United States Food and Drug Administration in 2011.^{26,27}

BIA-ALCL has not been related to smooth implants; however, smooth implants are not a definitive answer to the problems associated with aesthetic augmentation. Deficient performance has been observed when smooth implants have been placed in the prepectoral space.^{7,8,17}

Microtextured breast implants have been used in Europe and Asia since 2013. A retrospective study with 3 years of follow-up evaluated the safety of Motiva Ergonomix implants in 5813 consecutive cases of breast augmentation. A total of 44 complications were reported, with an overall complication rate of 0.76% over 3 years. There were no late complications, no related carcinoma, and no cases of primary capsular contracture with Motiva SilkSurface products. Although there was no long-term evaluation, the data have been promising thus far.^{9,10} In the other retrospective study with SilkSurface, 4 cases of malposition and 1 capsular contracture were encountered after 100 primary breast augmentations.¹⁰ Previous studies have reported microtextured prostheses placed in the retropectoral space using the inframammary approach.^{9,10} In our study, Motiva Ergonomix SilkSurface implants were placed in the subfascial space, resulting in the absence of capsular contracture or malposition, with the additional benefit of less procedural invasiveness (Table 2). Thus, combining the subfascial plane with the microtextured prostheses, the drawback of prepectoral augmentation was sought to be overcome.

When the superficial pectoralis fascia plane is anatomically followed below the IMF, then it will be terminated at the subcutis because the superficial pectoralis fascia disappears into the rectus abdominis fascia at this level.²⁸ Blind dissection might involve the risks of thinning the skin or destroying the definition of the IMF. Although several articles have described mixed subglandular and subfascial dissections,^{20,22,29} these were only possible with sharp dissection under direct visualization to maintain consistent envelope thickness and retain the natural curvature of the IMF in the inferolateral region.^{25,28,30,31} Previous studies have documented that the total subfascial technique could give significant support for implants and also reduce the risk of capsular contracture.^{18,22,24,28,32,33}

Microtextured implants have been reported to have a tendency for caudal migration and mobilization (similar to smooth implants) over time, thereby requiring fixation of the IMF.¹⁰ In this study, we placed microtextured round gel implants by using the axillary approach, which is assumed to have less predictability for locating new IMF levels postoperatively compared with procedures involving macrotextured implants or the inframammary approach. However, in this study, the dissection level at the far inferior border was at the subfascial plane, and the split fascia on the muscle could be expected to have a role in limiting the inferior migration of prostheses, which is in contrast to subglandular or dual plane dissection.^{10,32,34-36} Although

this would not provide robust support, inferior migration of prostheses was not noted in this study. Thus, for the refinement of surgical technique to overcome the drawback of prepectoral augmentation, total subfascial plane was created with an endoscopic assistance, and the microtextured implants in the subfascial space showed stable results to be feasible in terms of patient safety.

To manage the problem of less soft tissue volume over the prosthesis in prepectoral augmentation, it was crucial to select patients with enough soft tissue thickness at the upper pole; to provide more padding, the author covered the implant with pectoral fascia and transferred autologous fat when necessary. In this study, a fat graft was used for 12 patients (15.8%). The average infiltration volume was 14 mL (range, 8-35 mL).^{21,37-39}

A limitation of this study was a relatively short follow-up duration. Therefore, capsular contracture rates and the possibility of BIA-ALCL with microtextured implants should be evaluated with additional studies with longer follow-up periods.

CONCLUSIONS

The drawbacks of prepectoral implant placement were sought to be managed by means of fascial coverage and microtextured prostheses. Although the follow-up duration was short, major complications such as seroma, capsular contracture, and malposition were not encountered with Motiva Ergonomix SilkSurface implants. Therefore, prepectoral augmentation with microtextured implants should be reconsidered as a potential alternative to retropectoral methods because of the recent advances in surgical techniques and device technology.

Acknowledgments

The author thanks Jaeun Sim for the valuable contribution of the artwork.

Disclosures

The authors declared no potential conflicts of interest with respect to the research, authorship, and publication of this article.

Funding

The authors received no financial support for the research, authorship, and publication of this article.

REFERENCES

1. Nahabedian MY, Cocilovo C. Two-stage prosthetic breast reconstruction: a comparison between prepectoral and partial subpectoral techniques. *Plast Reconstr Surg.* 2017;140(6S Prepectoral Breast Reconstruction):22S-30S.
2. Jones G, Yoo A, King V, et al. Prepectoral immediate direct-to-implant breast reconstruction with anterior alloderm

- coverage. *Plast Reconstr Surg*. 2017;140(6S Prepectoral Breast Reconstruction):31S-38S.
3. Hidalgo DA, Spector JA. Breast augmentation. *Plast Reconstr Surg*. 2014;133(4):567e-583e.
 4. Lista F, Ahmad J. Evidence-based medicine: augmentation mammoplasty. *Plast Reconstr Surg*. 2013;132(6):1684-1696.
 5. Wong CH, Samuel M, Tan BK, Song C. Capsular contracture in subglandular breast augmentation with textured versus smooth breast implants: a systematic review. *Plast Reconstr Surg*. 2006;118(5):1224-1236.
 6. Schwartz MR. Evidence-based medicine: breast augmentation. *Plast Reconstr Surg*. 2017;140(1):109e-119e.
 7. Barnsley GP, Sigurdson LJ, Barnsley SE. Textured surface breast implants in the prevention of capsular contracture among breast augmentation patients: a meta-analysis of randomized controlled trials. *Plast Reconstr Surg*. 2006;117(7):2182-2190.
 8. Handel N, Cordray T, Gutierrez J, Jensen JA. A long-term study of outcomes, complications, and patient satisfaction with breast implants. *Plast Reconstr Surg*. 2006;117(3):757-767; discussion 768.
 9. Sforza M, Zaccheddu R, Alleruzzo A, et al. Preliminary 3-year evaluation of experience with silksurface and velvetsurface motiva silicone breast implants: a single-center experience with 5813 consecutive breast augmentation cases. *Aesthet Surg J*. 2018;38(suppl_2):S62-S73.
 10. Huemer GM, Wenny R, Aitzetmüller MM, Duscher D. Motiva ergonomix round silksurface silicone breast implants: outcome analysis of 100 primary breast augmentations over 3 years and technical considerations. *Plast Reconstr Surg*. 2018;141(6):831e-842e.
 11. Adams WP, Jr., Rios JL, Smith SJ. Enhancing patient outcomes in aesthetic and reconstructive breast surgery using triple antibiotic breast irrigation: six-year prospective clinical study. *Plast Reconstr Surg*. 2006;118(7 Suppl):46s-52s.
 12. Rohrich RJ, Cho MJ. The role of tranexamic acid in plastic surgery: review and technical considerations. *Plast Reconstr Surg*. 2018;141(2):507-515.
 13. Rebowe RE, Allred LJ, Nahabedian MY. The evolution from subcutaneous to prepectoral prosthetic breast reconstruction. *Plast Reconstr Surg Glob Open*. 2018;6(6):e1797.
 14. Sbitany H, Piper M, Lentz R. Prepectoral breast reconstruction: a safe alternative to submuscular prosthetic reconstruction following nipple-sparing mastectomy. *Plast Reconstr Surg*. 2017;140(3):432-443.
 15. Sbitany H. Important considerations for performing prepectoral breast reconstruction. *Plast Reconstr Surg*. 2017;140(6S Prepectoral Breast Reconstruction):7S-13S.
 16. Sigalove S. options in acellular dermal matrix-device assembly. *Plast Reconstr Surg*. 2017;140(6S Prepectoral Breast Reconstruction):39S-42S.
 17. Hammond D, Handel N, Canady J, Wixtrom RN. Impact of surgical approach, together with placement and breast implant texturing, on capsular contracture: an analysis of 10-year prospective multicenter data. *Plast Reconstr Surg*. 2014;134(4S-1):90-91.
 18. Munhoz AM, Gemperli R, Sampaio Goes JC. Transaxillary subfascial augmentation mammoplasty with anatomic form-stable silicone implants. *Clin Plast Surg*. 2015;42(4):565-584.
 19. Sampaio Goes JC, Munhoz AM, Gemperli R. The subfascial approach to primary and secondary breast augmentation with autologous fat grafting and form-stable implants. *Clin Plast Surg*. 2015;42(4):551-564.
 20. Graf RM, Bernardes A, Rippel R, Araujo LR, Damasio RC, Auersvald A. Subfascial breast implant: a new procedure. *Plast Reconstr Surg*. 2003;111(2):904-908.
 21. Kerfant N, Henry AS, Hu W, Marchac A, Auclair E. Subfascial primary breast augmentation with fat grafting: a review of 156 cases. *Plast Reconstr Surg*. 2017;139(5):1080e-1085e.
 22. Aygit AC, Basaran K, Mercan ES. Transaxillary totally subfascial breast augmentation with anatomical breast implants: review of 27 cases. *Plast Reconstr Surg*. 2013;131(5):1149-1156.
 23. Stoff-Khalili MA, Scholze R, Morgan WR, Metcalf JD. Subfascial periareolar augmentation mammoplasty. *Plast Reconstr Surg*. 2004;114(5):1280-1288; discussion 1289.
 24. Tijerina VN, Saenz RA, Garcia-Guerrero J. Experience of 1000 cases on subfascial breast augmentation. *Aesthetic Plast Surg*. 2010;34(1):16-22.
 25. Jinde L, Jianliang S, Xiaoping C, et al. Anatomy and clinical significance of pectoral fascia. *Plast Reconstr Surg*. 2006;118(7):1557-1560.
 26. Clemens MW, Brody GS, Mahabir RC, Miranda RN. How to diagnose and treat breast implant-associated anaplastic large cell lymphoma. *Plast Reconstr Surg*. 2018;141(4):586e-599e.
 27. Clemens MW, Miranda RN, Butler CE. Breast implant informed consent should include the risk of anaplastic large cell lymphoma. *Plast Reconstr Surg*. 2016;137(4):1117-1122.
 28. Salgarello M, Visconti G. Transaxillary totally subfascial breast augmentation with anatomical breast implants: review of 27 cases. *Plast Reconstr Surg*. 2014;133(2):220e-222e.
 29. Serra-Renom J, Garrido MF, Yoon T. Augmentation mammoplasty with anatomic soft, cohesive silicone implant using the transaxillary approach at a subfascial level with endoscopic assistance. *Plast Reconstr Surg*. 2005;116(2):640-645.
 30. Price CI, Eaves FF 3rd, Nahai F, Jones G, Bostwick J 3rd. Endoscopic transaxillary subpectoral breast augmentation. *Plast Reconstr Surg*. 1994;94(5):612-619.
 31. Tebbetts JB. Transaxillary subpectoral augmentation mammoplasty: long-term follow-up and refinements. *Plast Reconstr Surg*. 1984;74(5):636-649.
 32. Ventura OD, Marcello GA. Anatomic and physiologic advantages of totally subfascial breast implants. *Aesthetic Plast Surg*. 2005;29(5):379-383; discussion 384.
 33. Wright JH, Bevin AG. Augmentation mammoplasty by the transaxillary approach. *Plast Reconstr Surg*. 1976;58(4):429-433.
 34. Park SH, Sim HB. Endoscopic transaxillary prepectoral conversion for submuscular breast implants. *Arch Plast Surg*. 2018;45(2):158-164.

35. Sim HB, Sun SH. Transaxillary endoscopic breast augmentation with shaped gel implants. *Aesthet Surg J*. 2015;35(8):952-961.
36. Hunstad JP, Webb LS. Subfascial breast augmentation: a comprehensive experience. *Aesthetic Plast Surg*. 2010;34(3):365-373.
37. Auclair E, Blondeel P, Del Vecchio DA. Composite breast augmentation: soft-tissue planning using implants and fat. *Plast Reconstr Surg*. 2013;132(3):558-568.
38. Serra-Mestre JM, Fernandez Peñuela R, Foti V, D'Andrea F, Serra-Renom JM. Breast cleavage remodeling with fat grafting: a safe way to optimize symmetry and to reduce intermammary distance. *Plast Reconstr Surg*. 2017;140(5):665e-672e.
39. Zhu M, Cohen SR, Hicok KC, et al. Comparison of three different fat graft preparation methods: gravity separation, centrifugation, and simultaneous washing with filtration in a closed system. *Plast Reconstr Surg*. 2013;131(4):873-880.



THE AESTHETIC MEETING 2019
May 16–21, 2019 New Orleans Convention Center

Experience the Global Gathering of Aesthetic Innovators and Experts



THE AMERICAN SOCIETY FOR
AESTHETIC PLASTIC SURGERY, INC.

WE ARE
AESTHETICS.



THE AESTHETIC SURGERY EDUCATION
AND RESEARCH FOUNDATION

www.surgery.org/meeting2019