

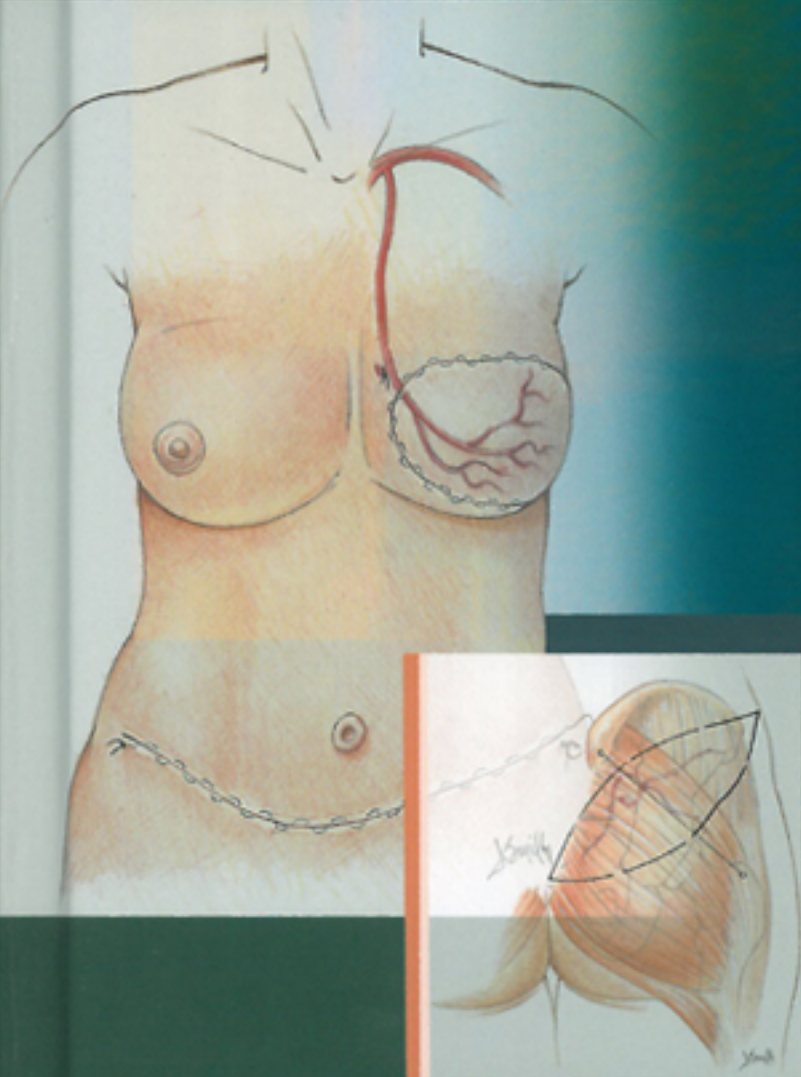
VOLUME ONE

Includes
**FULLY
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SURGERY OF THE BREAST

Principles and Art

THIRD EDITION



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One-stage Immediate Breast Reconstruction With Adjustable Implants

INTRODUCTION

Although autologous tissue is ideal for breast reconstruction, the magnitude of the surgery, the length of recovery, potential complications, and the resultant scarring are of concern to many patients. In addition, if radiation is anticipated following immediate reconstruction, an expander should be placed initially in order to avoid radiation to the flap. Autologous reconstruction can still be performed following radiation by placing a de-epithelialized flap in the expander pocket.

The increased awareness of the risk factors and the availability of genetic testing have increased the incidence of bilateral mastectomies being performed on younger women. These patients are eager to have immediate reconstruction with minimal scarring and minimal downtime. Many of these patients are already dissatisfied with their breasts and may have, or are considering, breast implants. For these patients, a one-stage implant reconstruction with minimal or no visible scarring, with the opportunity to correct prior hypomastia or ptosis with minimal surgical time and downtime, is often preferable to autologous flaps.

The one-stage reconstruction technique involves the following.

- Mastectomy performed using the skin-sparing technique
- Muscle release and inframammary fold reconstruction
- Use of adjustable implants

TECHNIQUE

Preoperative planning is done in concert with the general surgeon who will be performing the mastectomy. Inframammary folds are marked, and the topics of extent of skin resection and feasibility of nipple-areolar or skin preservation are discussed.

MASTECTOMY PERFORMED USING THE SKIN-SPARING TECHNIQUE

It is advantageous for the plastic surgeon to assist the general surgeon, at least initially, with the mastectomy. The general surgeon's awareness of the reconstructive procedure is key to obtaining an excellent result. The skin-sparing mastectomy is performed by the general surgeon, who is encouraged to use plastic surgery principles. Fiber-optic lighting is used to facilitate dissection. Care is taken to avoid trauma to the skin flaps. If necessary, a medial and lateral extension can be made to the circular incision for better exposure, or a separate incision can be made in the axilla for axillary dissection. Both incisions are easily concealed.

Keeping the option open to maintaining the nipple-areolar complex or the areolar skin, preserving the fascia, avoiding any damage to the muscle, maintaining the inframammary fold, and maintaining viable skin flaps are keys to facilitating an optimal reconstruction (Figs. 30.1 to 30.4).

MUSCLE RELEASE AND INFRAMAMMARY FOLD

After the general surgeon has completed the mastectomy, the drapes are changed and hemostasis checked. The integrity of the muscle and inframammary fold is then assessed. If the muscle and fold are totally intact, a similar technique to submuscular breast augmentation is possible. A subpectoral-serratus anterior muscular pocket is dissected, starting at the lateral border of the pectoralis major muscle. Dissection continues approximately 2 cm below the inframammary fold. The muscle fibers and rectus fascia are incised at this level. The inframammary fold is enhanced, while the pectoralis remains attached to the fascia above the releasing incision.

As the muscle is intact and attached, no fixation sutures or dermal grafts are necessary (Figs. 30.5 and 30.6).

If the decision is made to detach the pectoralis muscle, two options are available: (a) elevation of the pectoralis and serratus muscle and (b) elevation of the pectoralis major only. For elevation of the pectoralis and serratus muscle, the two muscles are sutured together. Fixation will be necessary to prevent retraction of the muscle. Fixation may be done with:

- Sutures (Fig. 30.7; see Fig. 30.1)
- Mesh (Fig. 30.8)
- Acellular dermis (Fig. 30.9; see Figs. 30.2 and 30.3)
- Autologous dermis

For elevation of the pectoralis major only, fixation is accomplished with acellular dermis, both inferiorly and laterally (Fig. 30.9B). Dissection begins at the lateral border of the pectoralis major muscle. The muscle is elevated and detached inferiorly at its insertion. It is also partially detached medially. The serratus anterior muscle is elevated laterally and detached inferiorly at the level of the inferior margin of the pectoralis major. The two muscles are then sutured together with interrupted sutures, thus expanding the submuscular pocket (Fig. 30.10).

As an alternative to acellular dermis, an autologous dermal graft may be used. If the muscle is damaged or partially removed, an acellular dermal graft is invaluable in augmenting and strengthening the muscle (see Fig. 30.4). An intraoperative expander is placed beneath the muscle and partially expanded to assess the size and position. The inferior edge of the muscle or the dermal graft is then sutured to the fascia at the level of the inframammary fold. A deliberate space of 0.5 to 1 cm is left between the inferior edge of the dermal graft and the inframammary fold. This space allows the lower pole to expand differentially, resulting in a more anatomic pocket. Several sutures of 2/0 Vicryl are placed from the muscle edge to the fascia for added security. If the fascia has been removed or the muscle is damaged or atrophic, the muscle is fully released and then reinforced with acellular dermal grafts.

Acellular dermal grafts are rapidly vascularized when placed in contact with muscle. However, revascularization has been

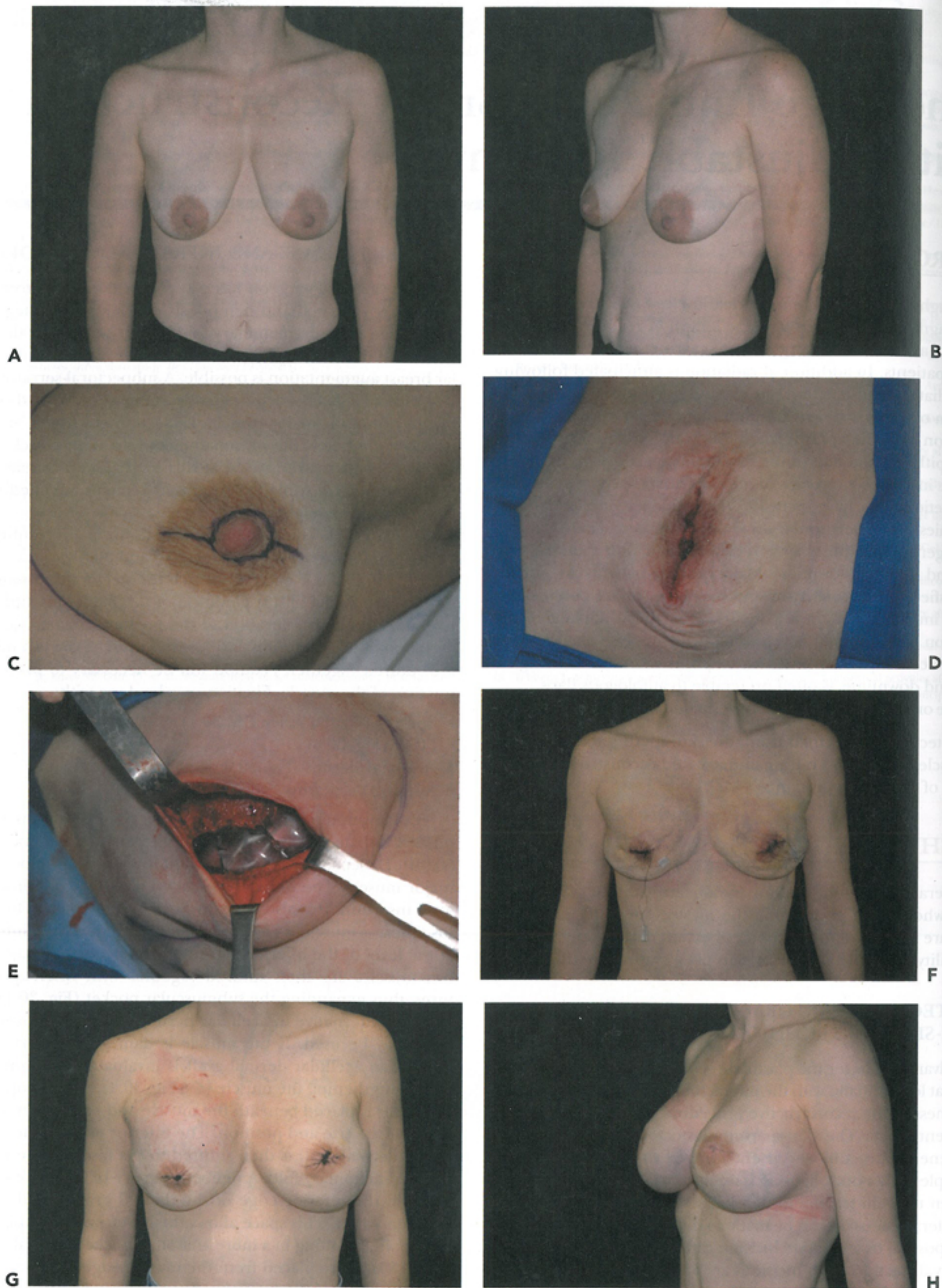


Figure 30.1. A: Preoperative view of a patient scheduled for bilateral mastectomy. B: Lateral view. C: Skin marking. D: Following prophylactic mastectomy, areola and skin are preserved. E: Reconstruction with Becker 50/50 placed subpectorally. Muscle sutured to fascia at the level of the inframammary fold. F: Day following surgery. G: Following saline injection. H: Lateral view following overexpansion. (continued)

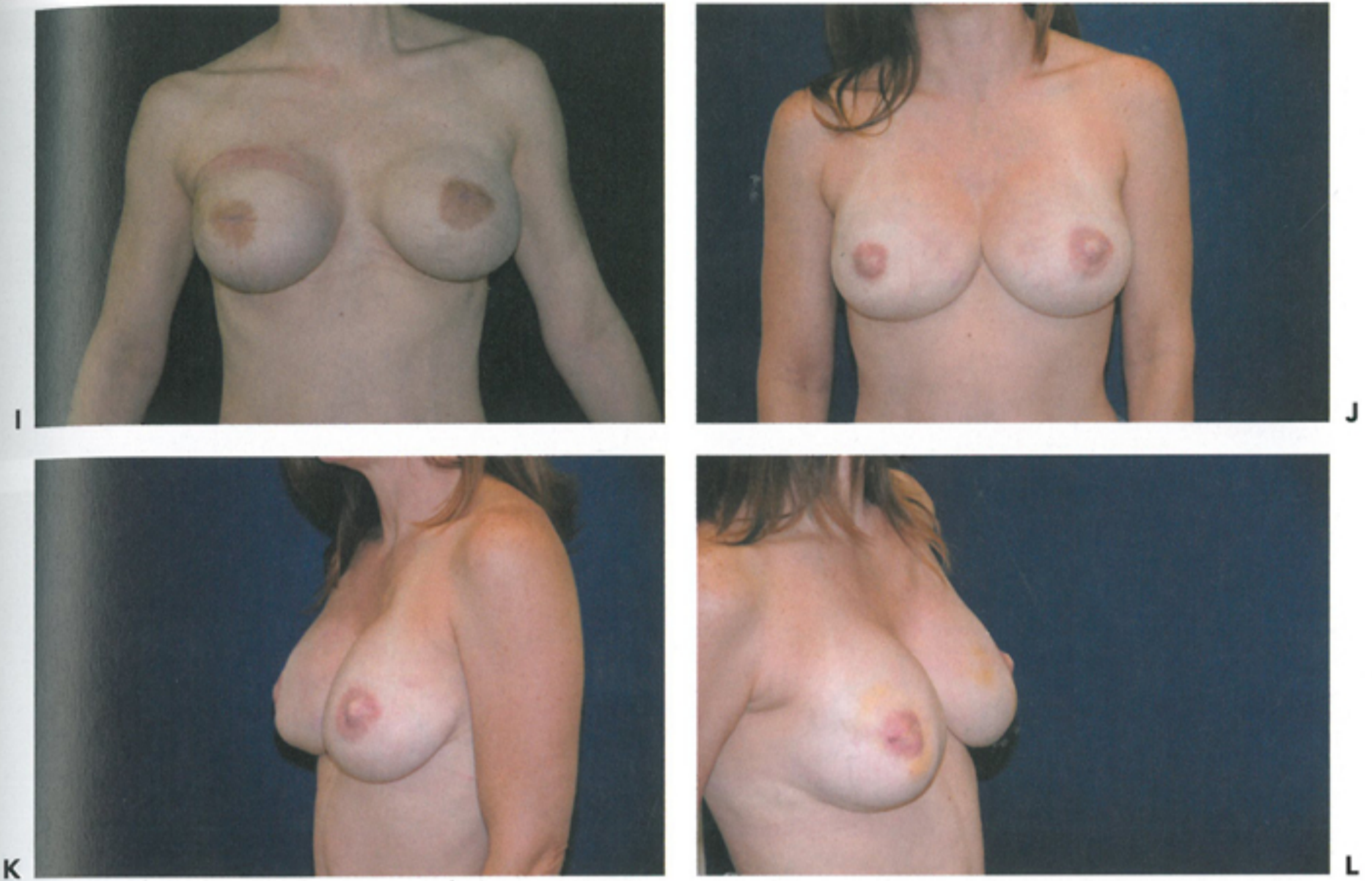


Figure 30.1. (Continued) I: Result following overexpansion. J: Final result. K: Final result, left oblique. L: Final result, right oblique.



Figure 30.2. A: Preoperative anterior view of a patient for bilateral skin-sparing mastectomies. B: Preoperative lateral view. C: Postoperative view following bilateral skin-sparing mastectomy. D: Acellular dermal graft sutured to the inferior edge of the pectoralis major muscle. (continued)



Figure 30.2. (Continued) E: Adjustable implant placed beneath the muscle-dermal graft flap. F: Purse-string closure following immediate reconstruction. G: Saline added via external filling dome once circulation is assured. H: Final result following injection dome removal and nipple reconstruction. I: Final result, lateral view. J: Final result; close-up view, no visible scar. K, L: Final result following areolar tattoo.



Figure 30.3. A: Preoperative view. B: Preoperative oblique view. C: Insertion of Becker 50/50 implant. Dermal graft sutured to inferior and lateral border of pectoralis major muscle. D: Early postoperative result. E: Implants being filled. F: Postoperative oblique view. G: Final result. H: Final result, oblique view.



Figure 30.4. A: Preoperative patient with bilateral submuscular breast implants with carcinoma of the left breast scheduled for bilateral areolar-sparing mastectomies. B: Skin marking, saving areolar skin. C: Following mastectomy and implant removal. Note thin muscle. D: Muscle reinforced with acellular dermal graft. E: Following reconstruction with bilateral Becker 50/50 implants. (*continued*)



Figure 30.4. (Continued) **F:** Filling implants once circulation is satisfactory. **G:** Early postoperative result. **H:** Three months postoperative. **I:** Oblique view. **J:** Close-up view of scar showing areolar skin. **K:** Final result prior to injection dome removal. (continued)

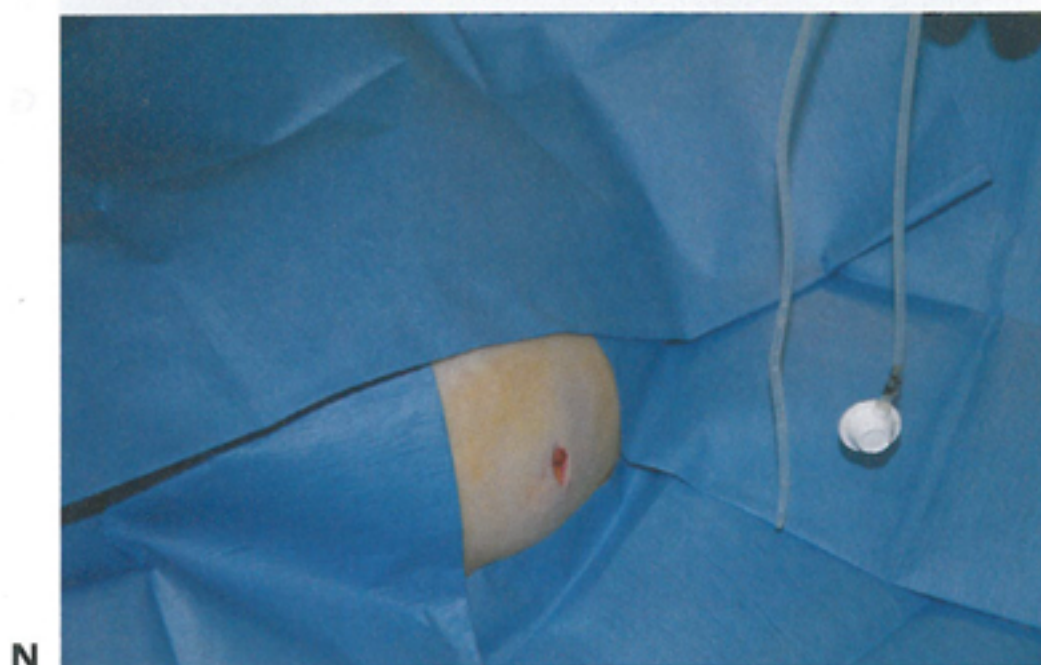


Figure 30.4. (Continued) **L:** Incision overlying injection dome. **M:** Injection dome grasped beyond the connector. **N:** Injection dome removed. **O:** Final result.

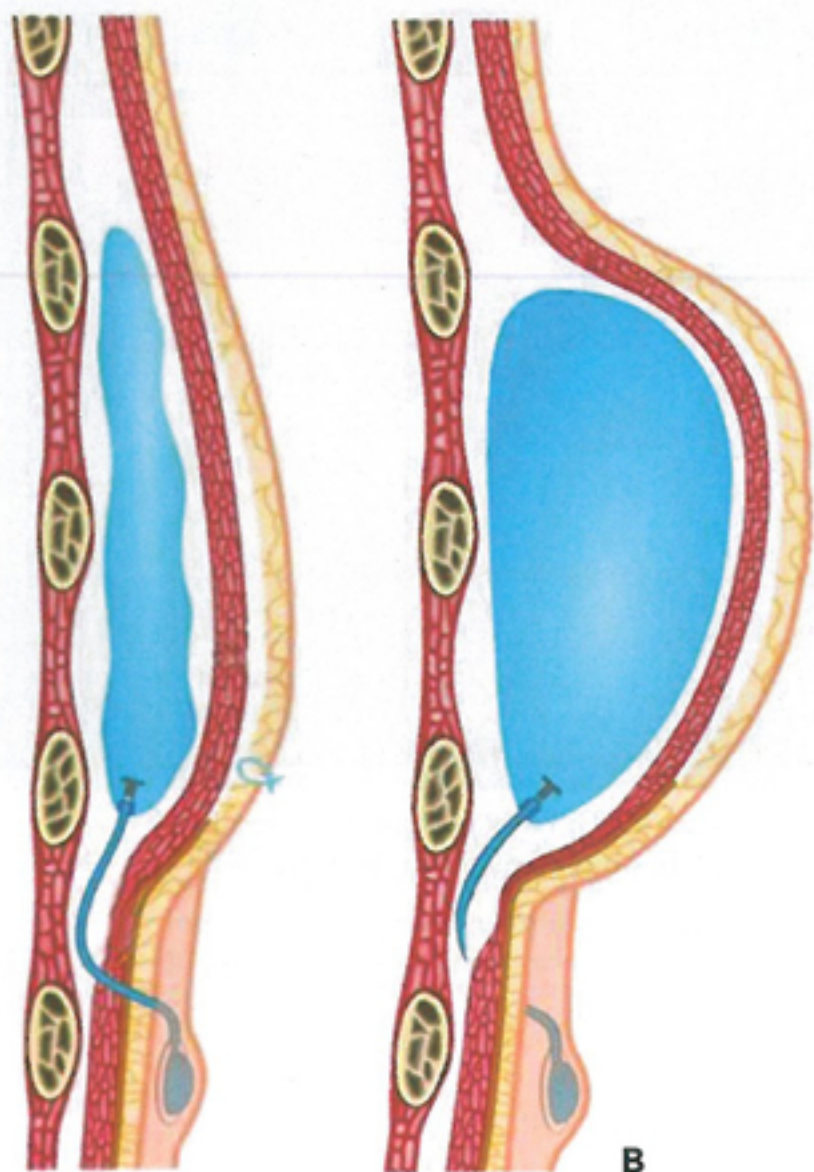


Figure 30.5. **A:** Implant placed in total submuscular pocket without inferior release. **B:** Inferior muscle attachment prevents lower pole expansion resulting in a high-riding implant.

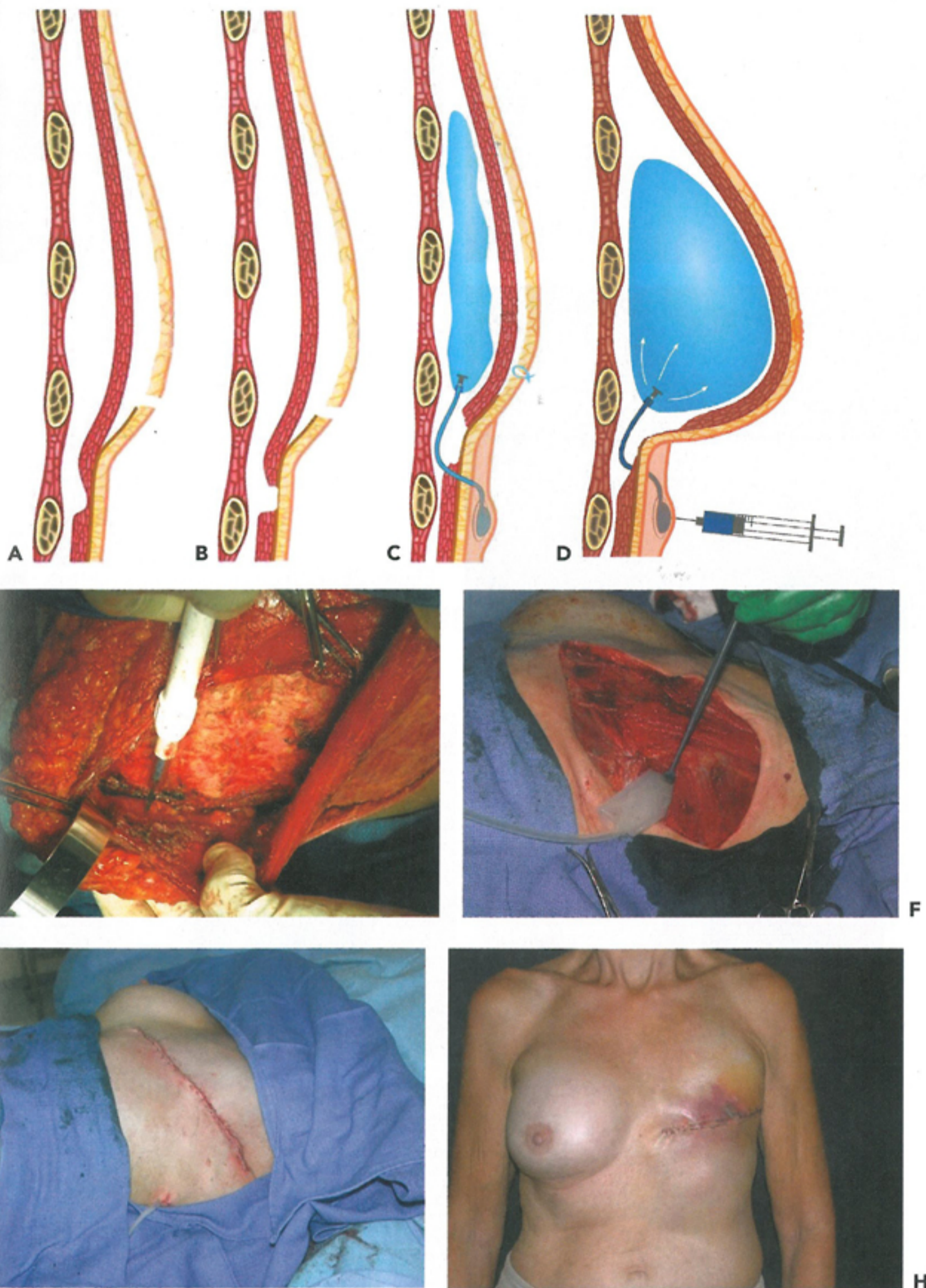


Figure 30.6. A: Following skin-sparing mastectomy. Muscle and inframammary fold intact. B: Muscle and fascia released below inframammary fold. C: Implant inserted into submuscular pocket. D: Saline added to implant; lower pole expands due to muscle release. E: Muscle and fascia incised below inframammary fold. F: Inserting Spectrum implant. G: Implant underfilled, skin closed, tension free. H: Compromised skin flaps noted after surgery. (continued)



Figure 30.6. (Continued) **I:** Implant filled once circulation is reestablished. **J:** Implant overexpanded. **K:** Final result.

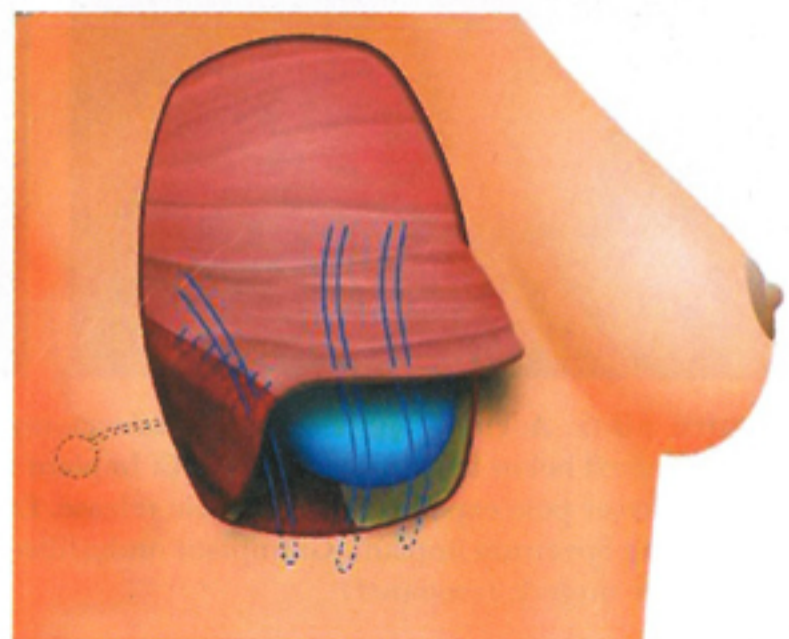
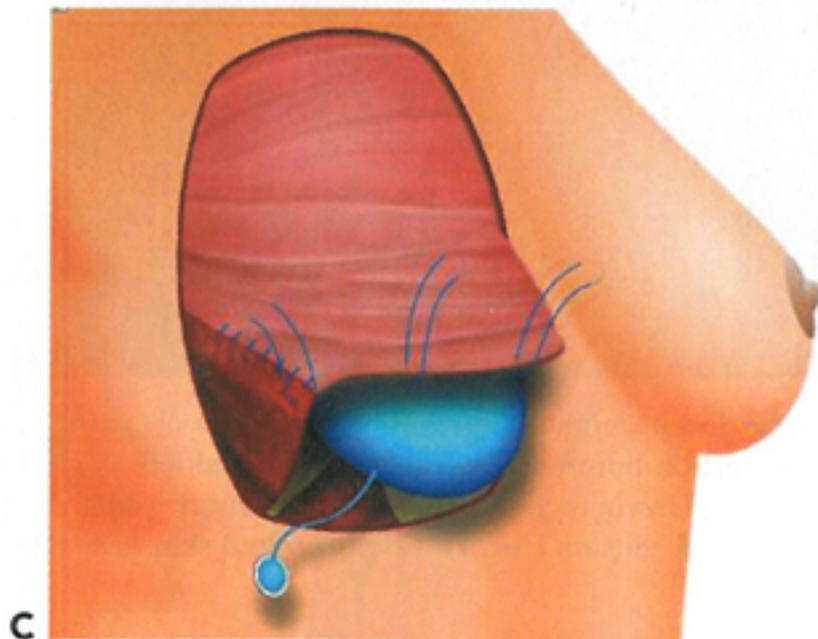
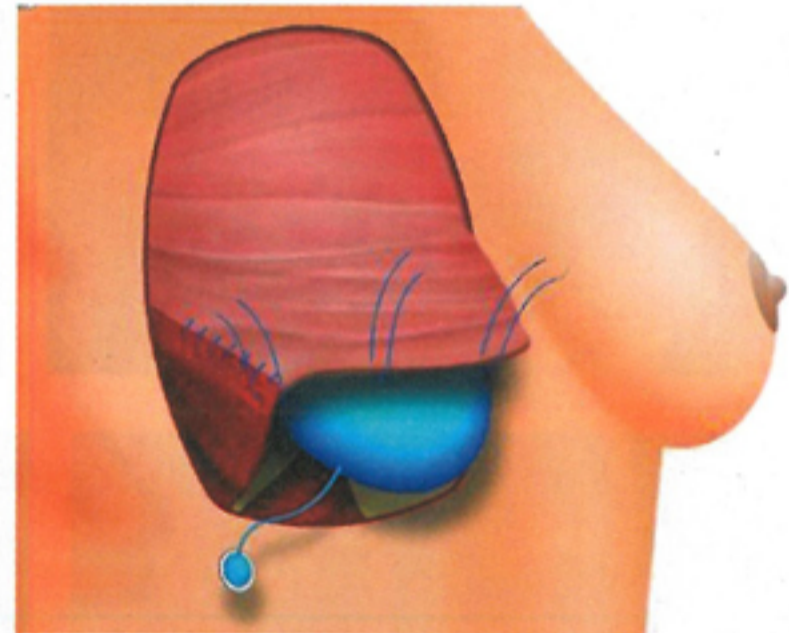
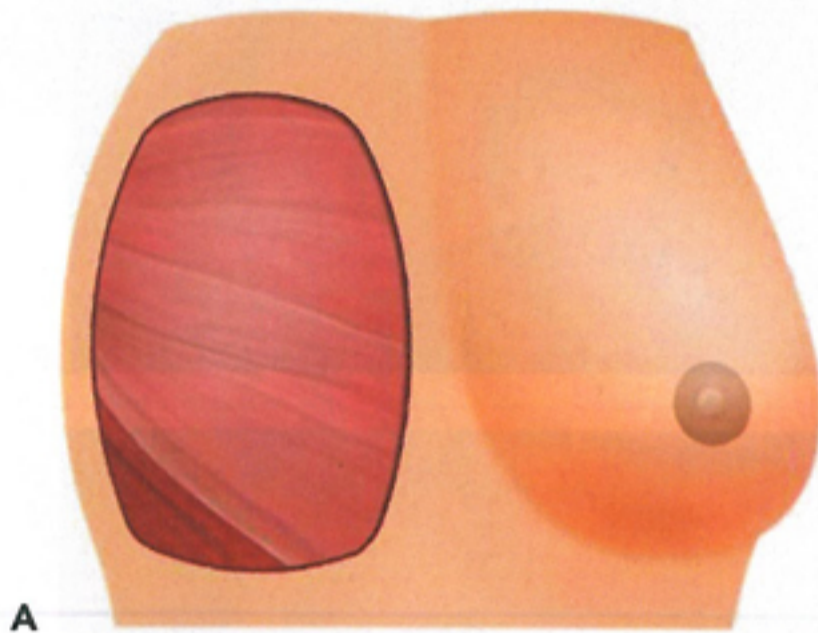


Figure 30.7. Diagrammatic drawing of reconstructive technique. **A:** Defect following mastectomy. **B:** Pectoralis major and serratus muscle elevated. **C:** Pectoralis and serratus sutured together. Adjustable implant inserted beneath muscle flap. **D:** Adjustable implant in position. Injection dome buried in subcutaneous pocket. Inframammary fold reconstructed with sutures from the edge of the muscle flap to the fascia at the inframammary fold location.

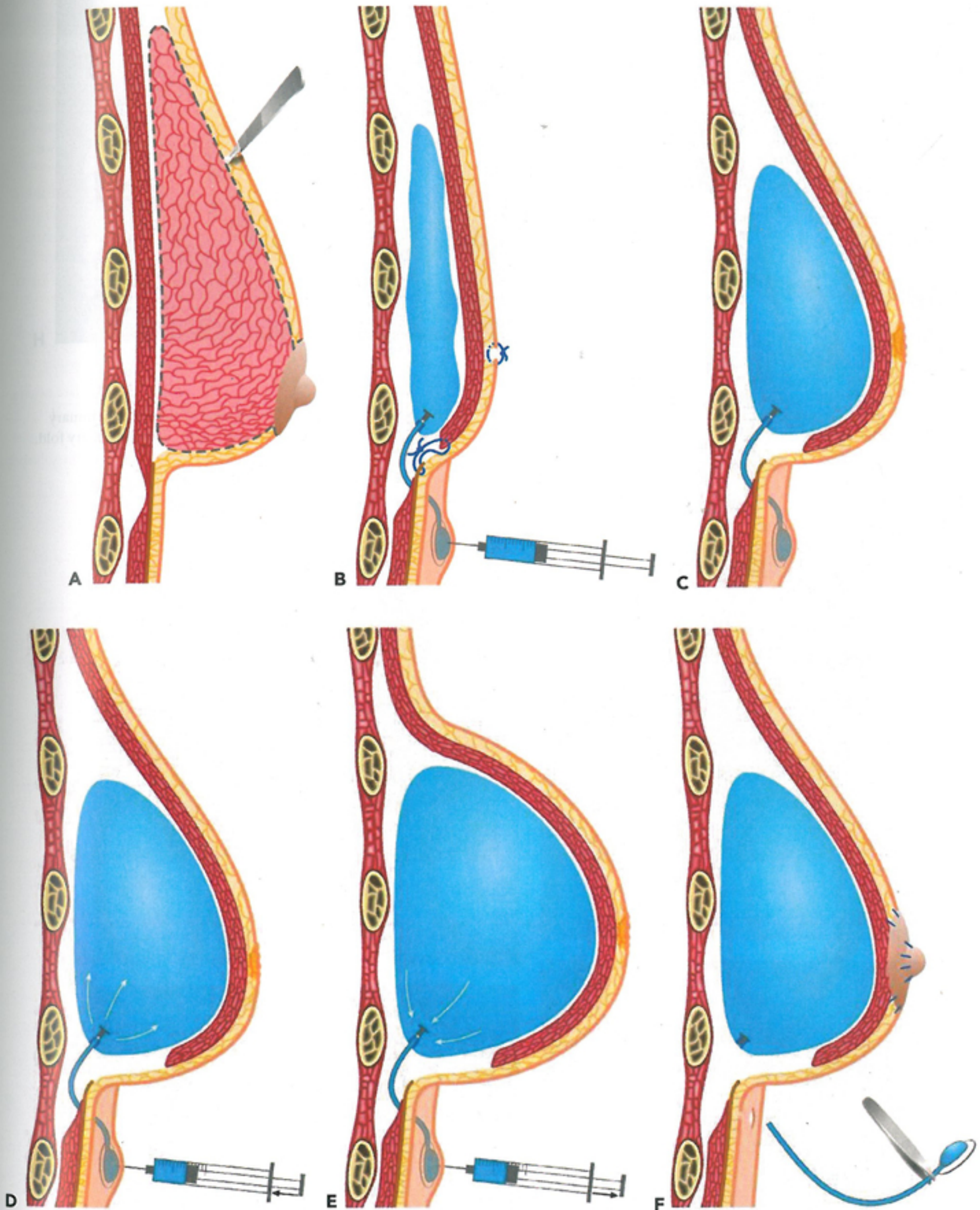


Figure 30.8. Diagrammatic representation of immediate reconstructive technique with muscle release with suture fixation. **A:** Patient prior to mastectomy showing circumareolar incision. **B:** Insertion of adjustable implant in submuscular position following pectoralis release and inframammary fold fixation, or reconstruction by suturing the inferior edge of the pectoralis major to the fascia at the level of the inframammary fold. **C:** Implant partially expanded postoperatively. **D:** Implant overexpanded. **E:** Saline removal. **F:** Final result, injection dome removal and nipple-areolar reconstruction. (*continued*)

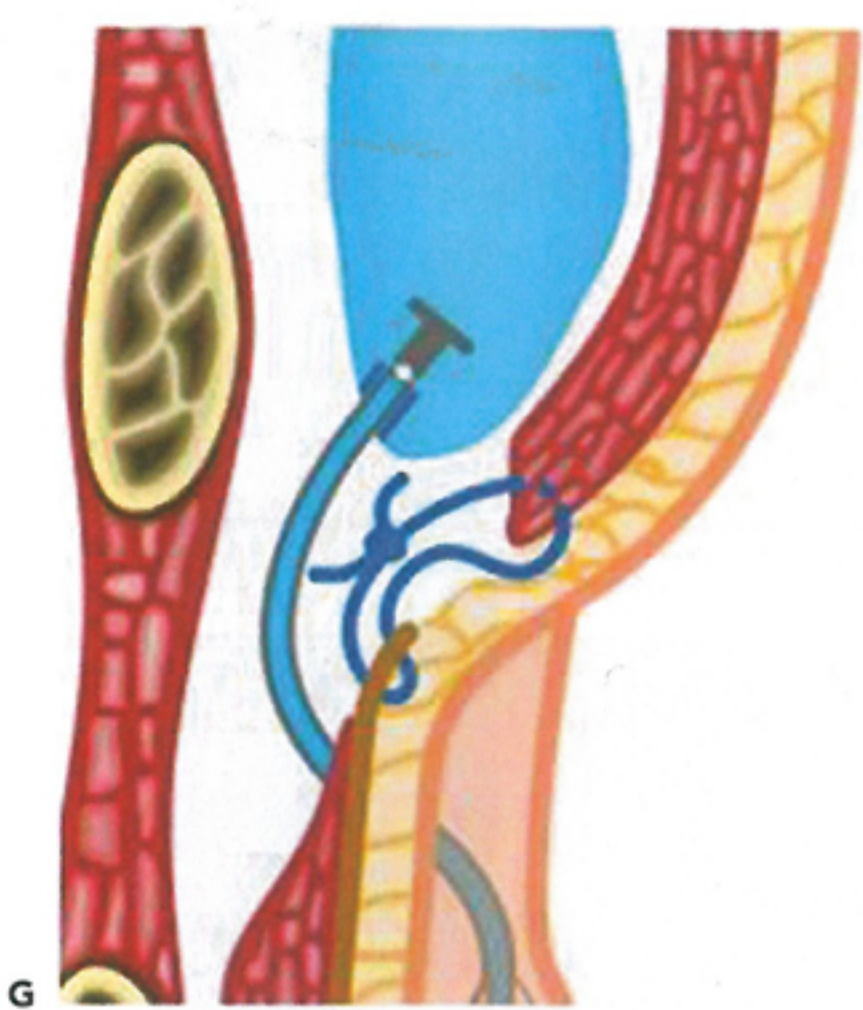


Figure 30.8. (Continued) **G:** Enlarged view of the inframammary fold area. **H:** Vypro mesh fixation of muscle to the inframammary fold.

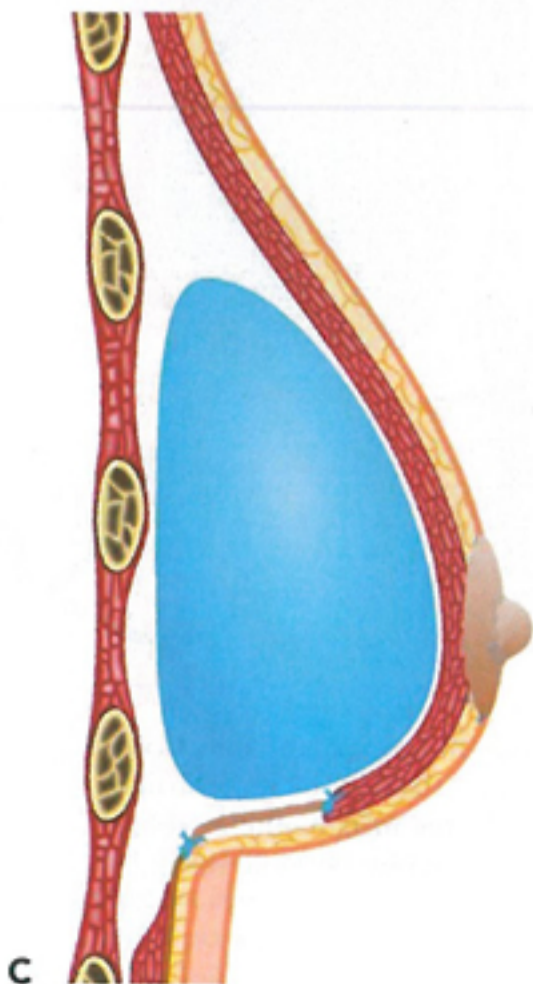
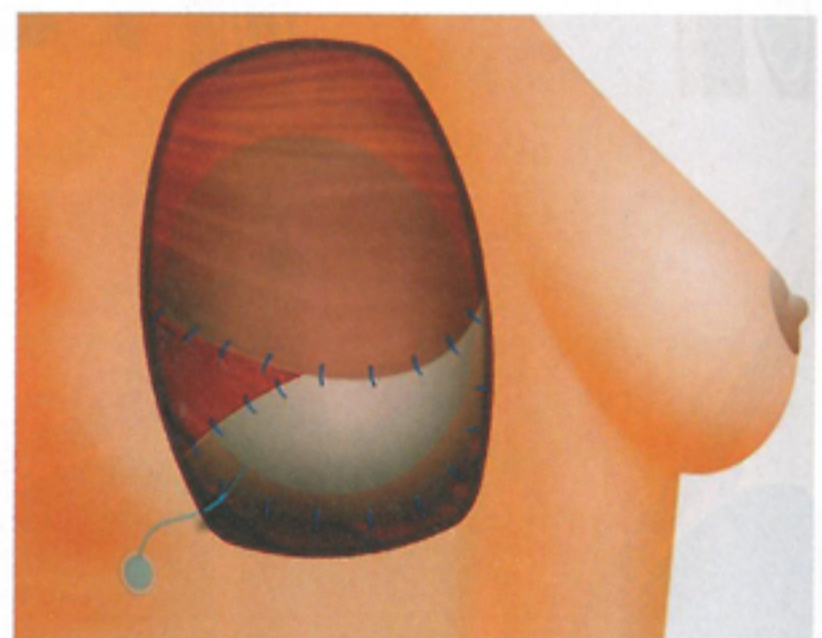
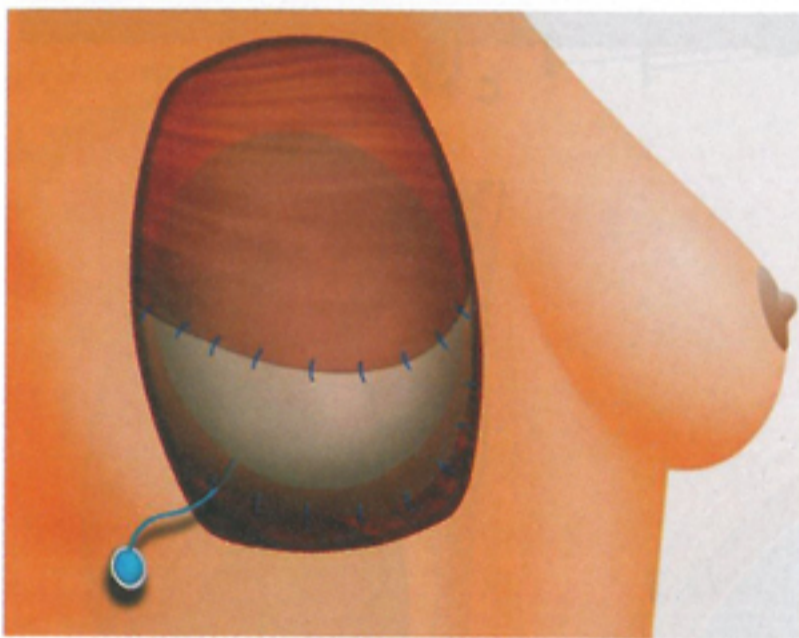


Figure 30.9. Acellular dermal grafts. **A:** Pectoralis major muscle elevated. Dermal graft sutured to the muscle edge and the fascia at the level of the inframammary fold. **B:** Pectoralis major and serratus anterior muscles elevated, sutured together. Dermal graft sutured to muscle edge and inframammary fold. **C:** Cross section of acellular dermal graft fixation to pectoralis major muscle.

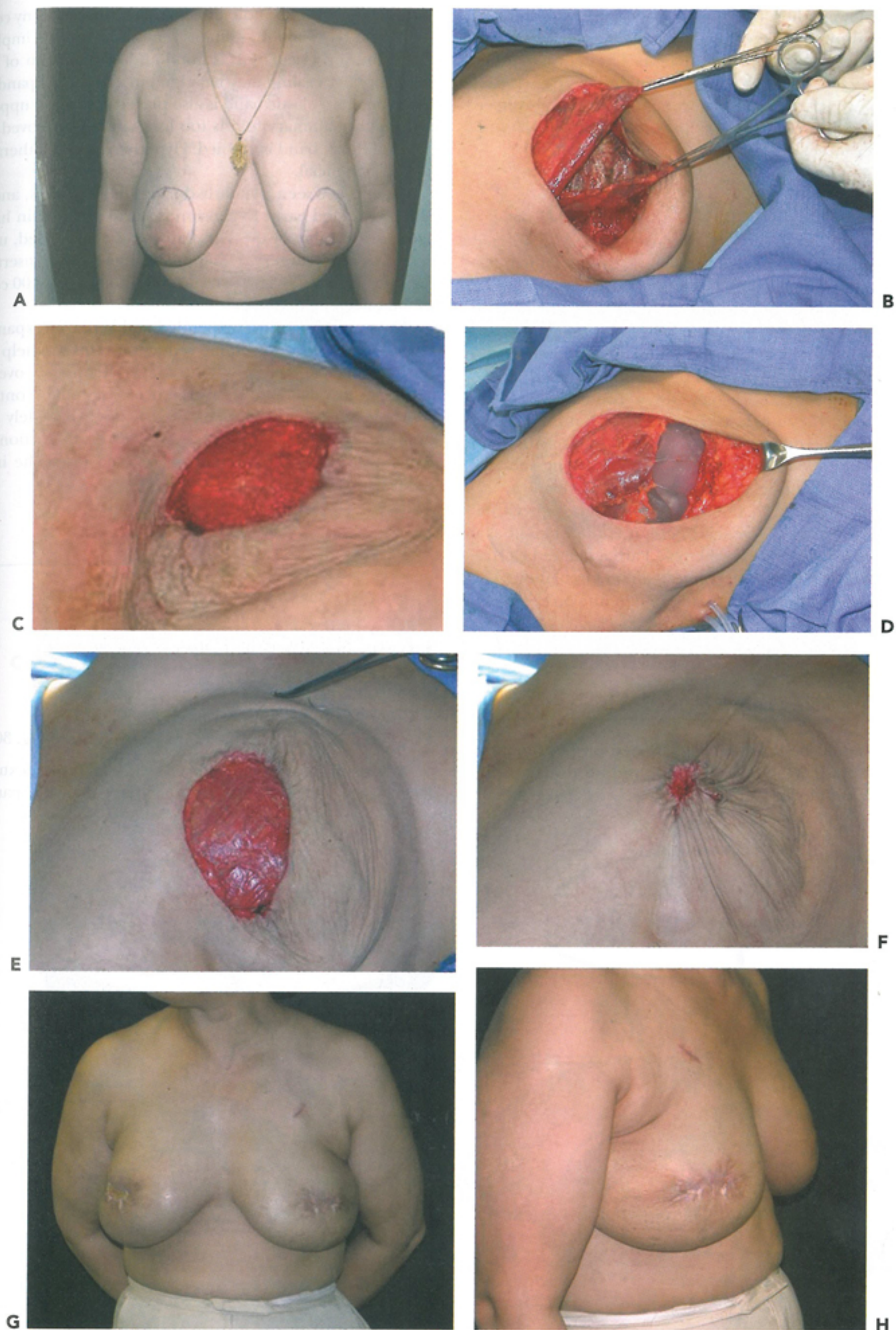


Figure 30.10. A: Patient with ptotic breasts prior to bilateral mastectomy. B: Defect following skin-sparing mastectomy. C: Pectoralis major and serratus anterior muscles detached and elevated. D: Pectoralis major sutured to serratus anterior muscle; muscle edge sutured to the fascia at the level of the inframammary fold. E: Inferior skin flap sutured to muscle. F: Purse-string closure. G: Final result. H: Final result, lateral.

noted to be slower when the graft is placed over the implant posteriorly and in contact with subdermal fat anteriorly, especially if the patient has had prior radiation. Therefore, in order to facilitate revascularization, the use of thinner grafts is preferred. Meshing dermal grafts using a 1:1 graft has also been found to be beneficial. Wherever possible, the skin closure should be over muscle rather than over dermal graft.

USE OF ADJUSTABLE IMPLANTS

The intraoperative expander is then replaced with the selected adjustable implant. The desired amount of saline is added, taking care to avoid any tension on compromised skin flaps. Antibiotics or Betadine should not be added to the saline. The fill tube is shortened appropriately, then attached to the injection dome and secured with two silk ties. The injection dome is then placed in a subcutaneous pocket lateral to the incision or in the axilla, where it is secured with absorbable sutures. Two drains are then placed, one above the muscle and one below. To prevent retrograde infection from drains, which may be left in place for up to 2 weeks, the drains should be placed through a long subcutaneous tunnel. A metal trochar facilitates drain placement.

The patient is placed in the upright position to check the position of the implant. The skin incision is then closed as a purse-string or V-Y closure in two layers. Partial delayed closure can be performed if there is a concern about circulation. The implant is usually underfilled initially, depending on the viability and tension on the skin flaps.

POSTOPERATIVE MANAGEMENT

The breasts should be thoroughly examined on postoperative day 1. The patient is helped to stand, and all dressings are removed. The position of the implant is assessed and manually

manipulated into position if necessary. If there are any concerns about skin flap viability, saline is removed from the implant.

If skin flap circulation is good and the position of the implant too high, saline may be added in order to expand the inferior pole. An elastic band is also placed across the upper pole. If the inframammary fold is too low, saline is removed and an inferior elastic band is applied. Hyperbaric oxygen therapy may also be beneficial.

Patients are seen regularly during the first week, and saline filling is started early. Expansion is started after pain has stabilized and viability of the skin flaps has been assured, usually 2 or 3 days after surgery. Using a 23-gauge needle inserted into the injection dome under sterile conditions, 50 to 100 cc are injected once or twice weekly.

The implants are overexpanded and kept overexpanded for several weeks prior to volume reduction. This will help remove the skin folds and improve the shape. Temporary overexpansion may also decrease the incidence of capsular contracture. The injection domes are removed at approximately 3 to 12 months, at which time nipple-areolar reconstruction is performed. Prophylactic antibiotics are used when the injection domes are removed.

IMPLANT SELECTION

The implants are available in the following styles:

- Single-lumen saline: Spectra (Fig. 30.11)
- Double-lumen gel saline: Becker (Fig. 30.12)
- Gel, 25% (Fig. 30.13)
- Gel, 50% (Fig. 30.14)
- Contour Profile, 35% gel (see Fig. 30.5)
- Adjustable gel implant, 80% to 100% gel (see Fig. 30.6)

Adjustable implants are available with smooth or textured surfaces. My preference is for smooth surface implants, particularly

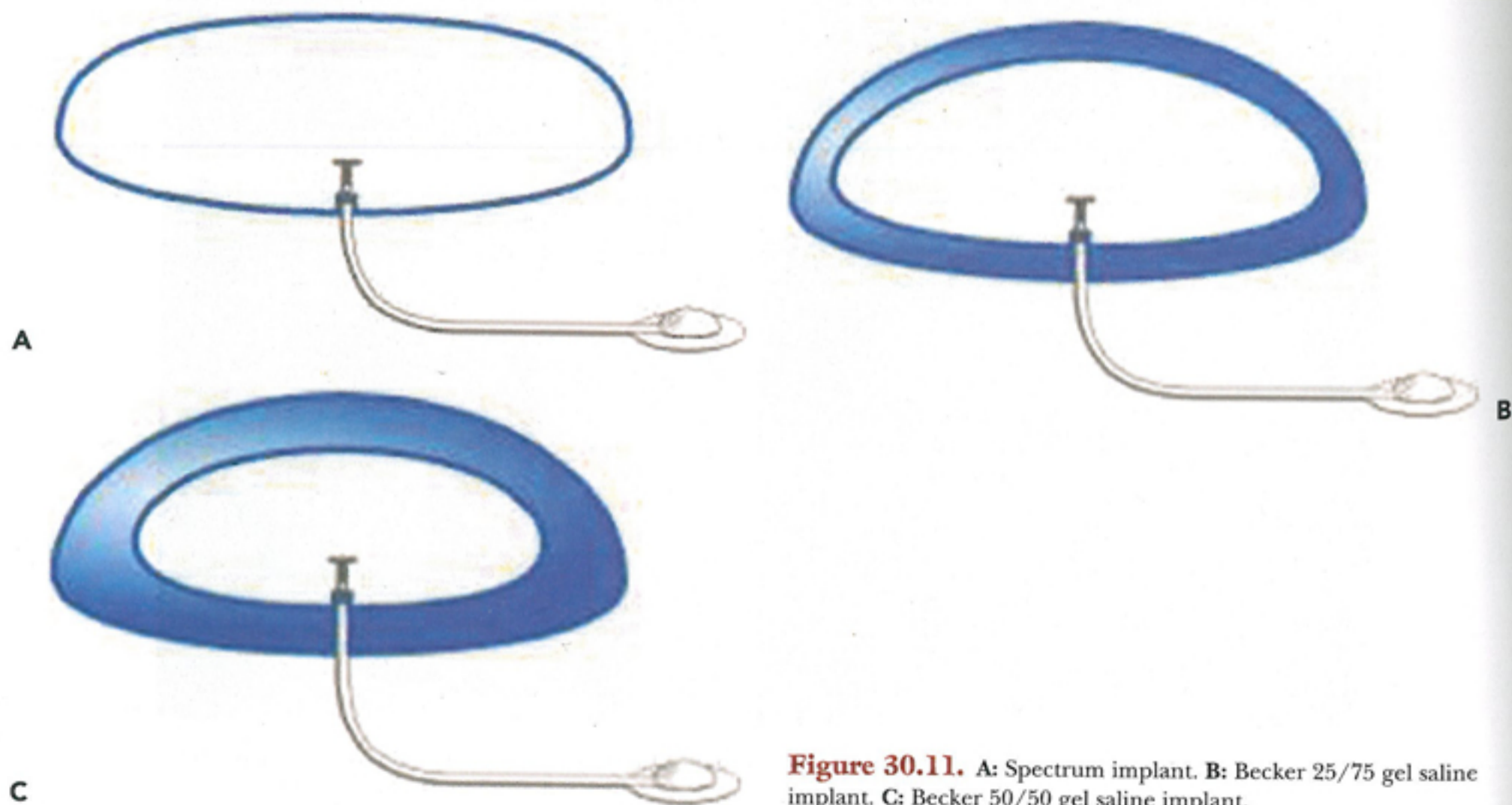


Figure 30.11. A: Spectrum implant. B: Becker 25/75 gel saline implant. C: Becker 50/50 gel saline implant.

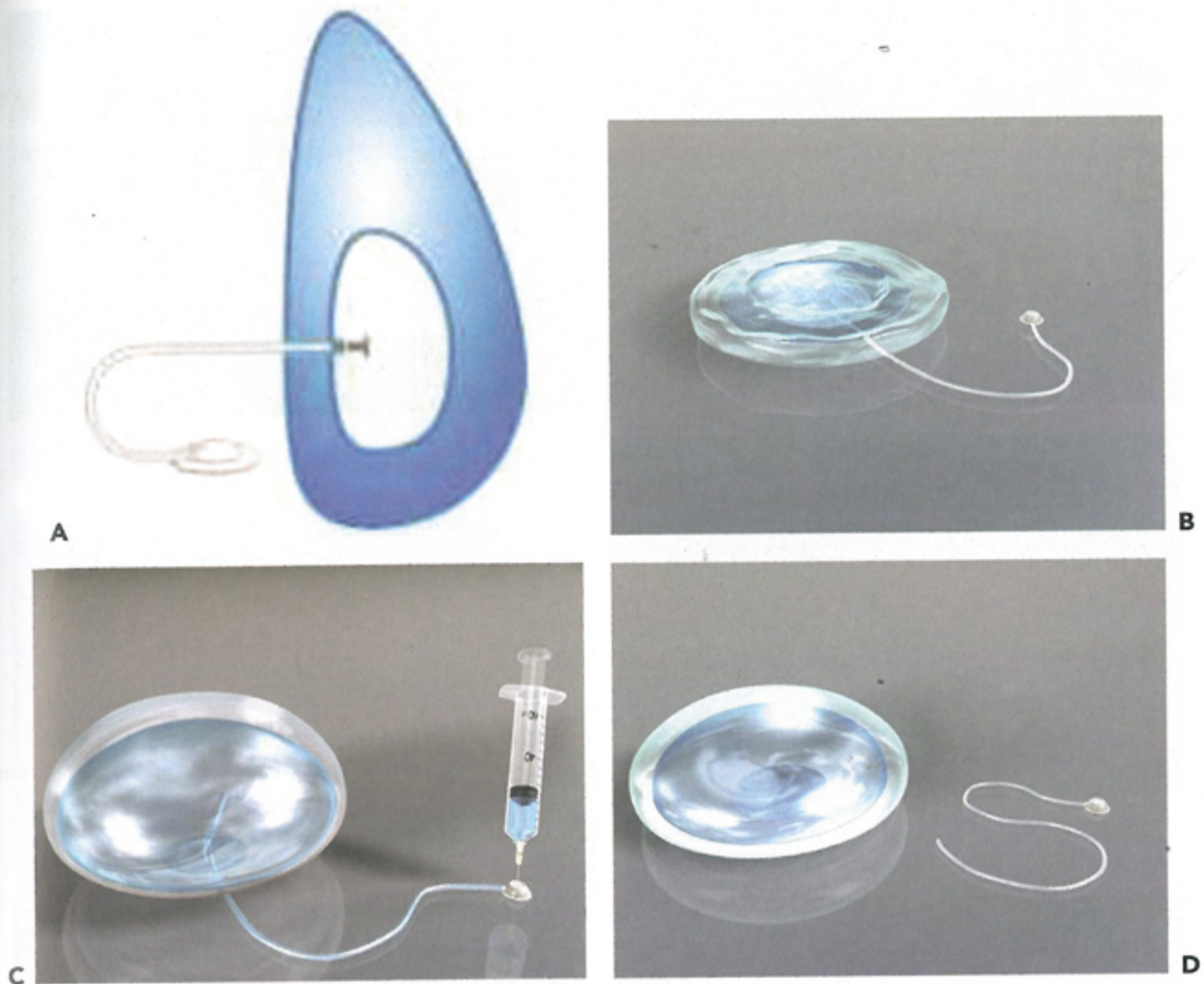


Figure 30.12. Becker 35 Contour Profile implant.

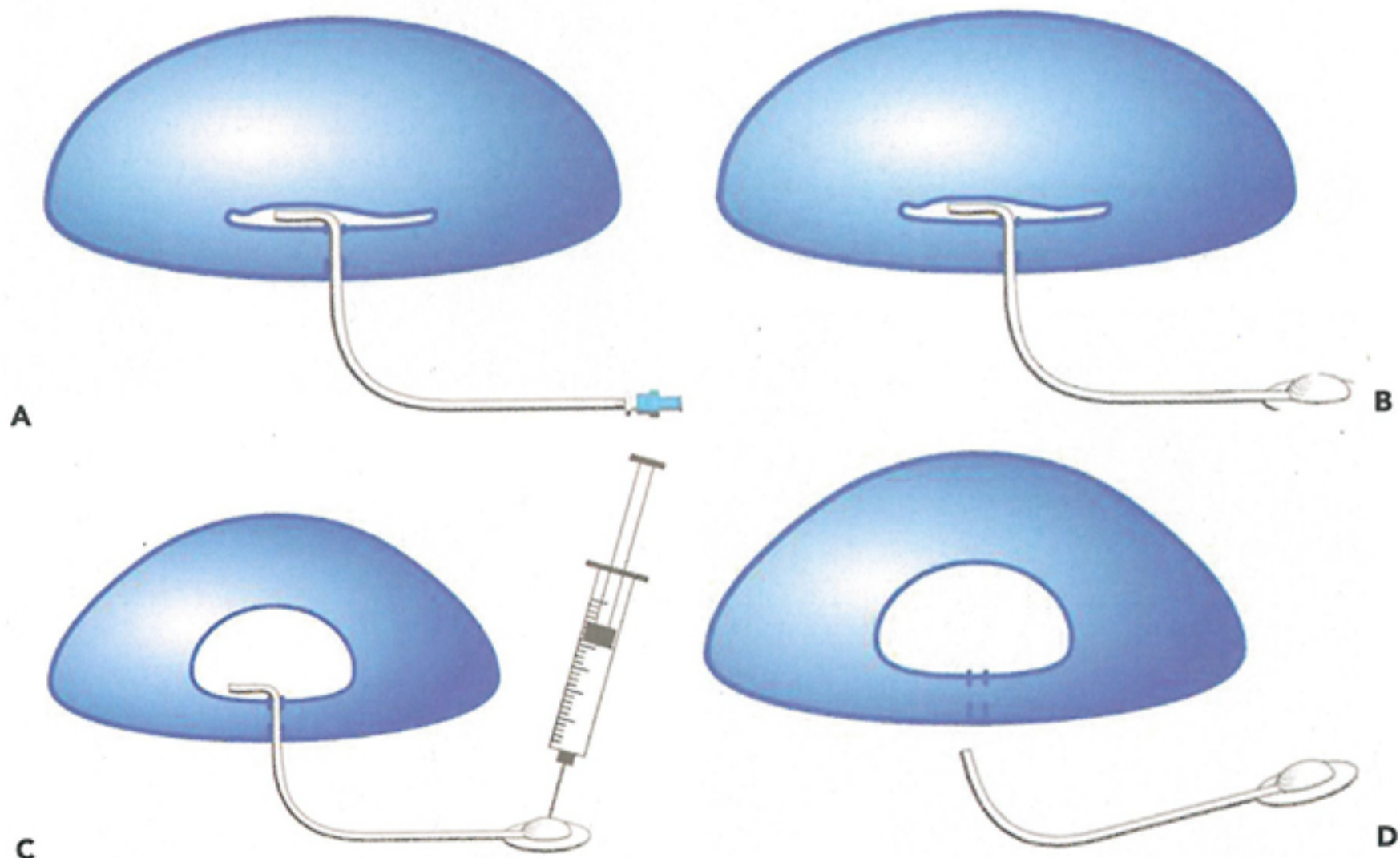


Figure 30.13. A: Adjustable gel Spectra Becker implant. B: Adjustable gel Spectra Becker injection dome attached. C: Adjustable gel Spectra Becker filled to desired volume. D: Adjustable gel Spectra Becker fill tube removed.

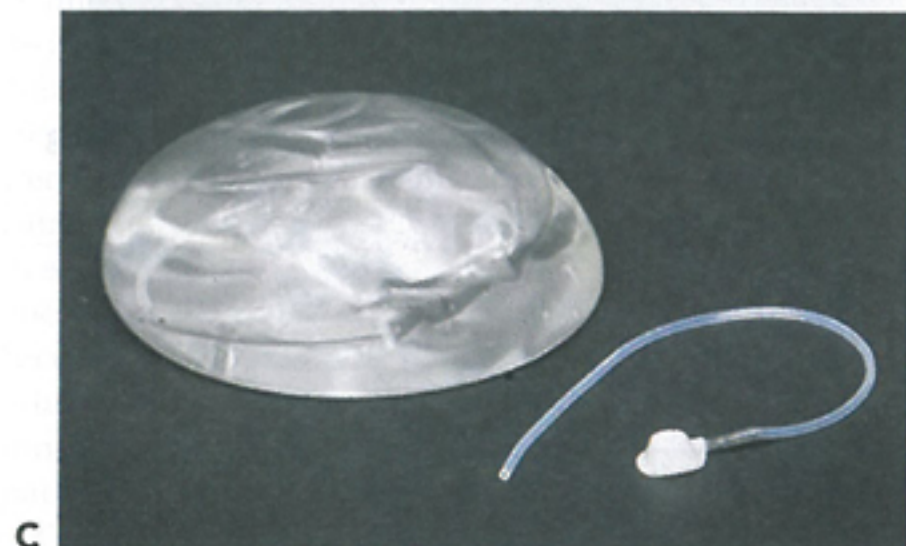
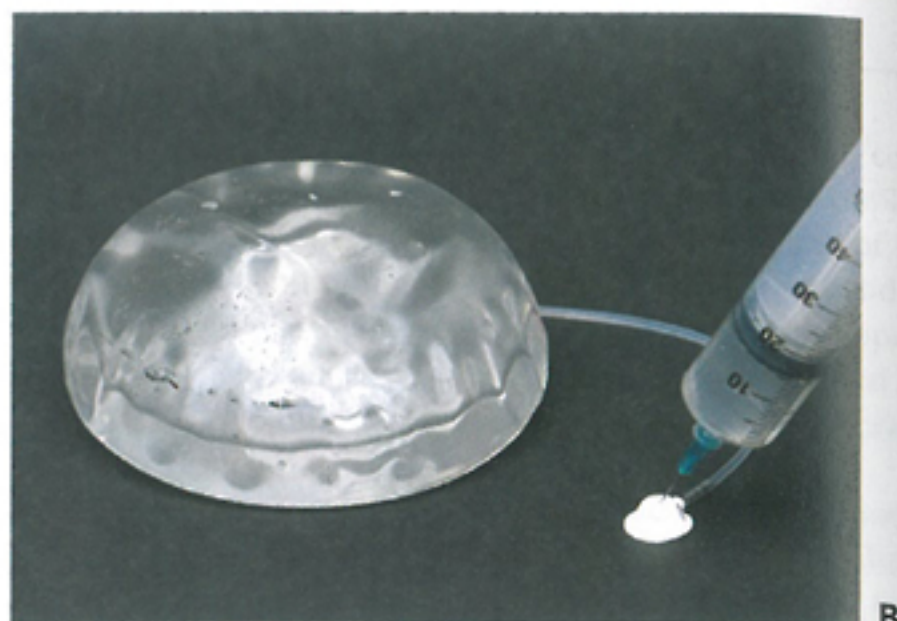
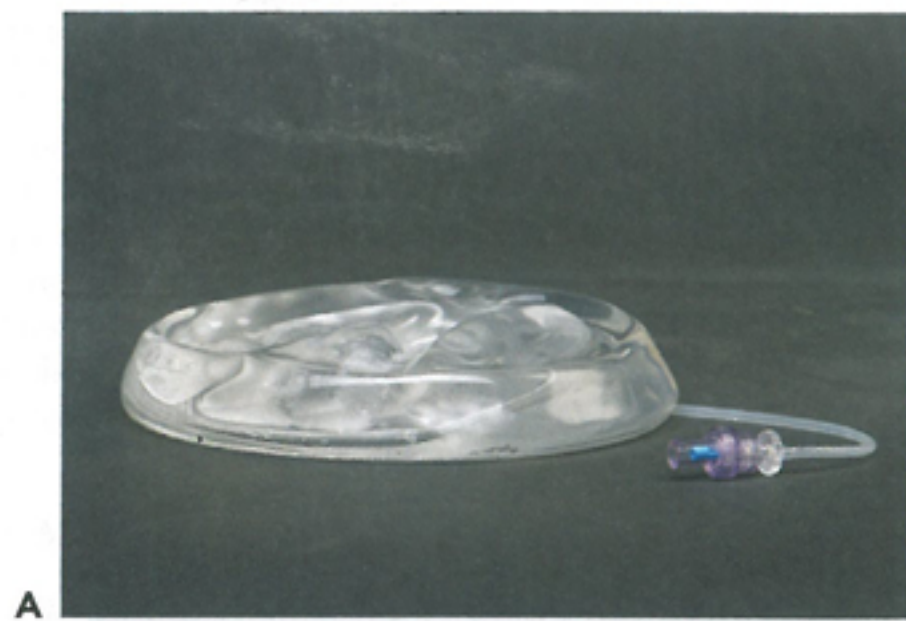


Figure 30.14. A: Becker 50/50 implant, filling tube attached. B: Becker 50/50 implant, saline added via injection dome. C: Becker 50/50 implant, injection dome removed.



Figure 30.15. A: Preoperative anterior view of patient with BRCA mutation scheduled for bilateral prophylactic mastectomies. B: Preoperative lateral view. C: Preoperative oblique view. (continued)

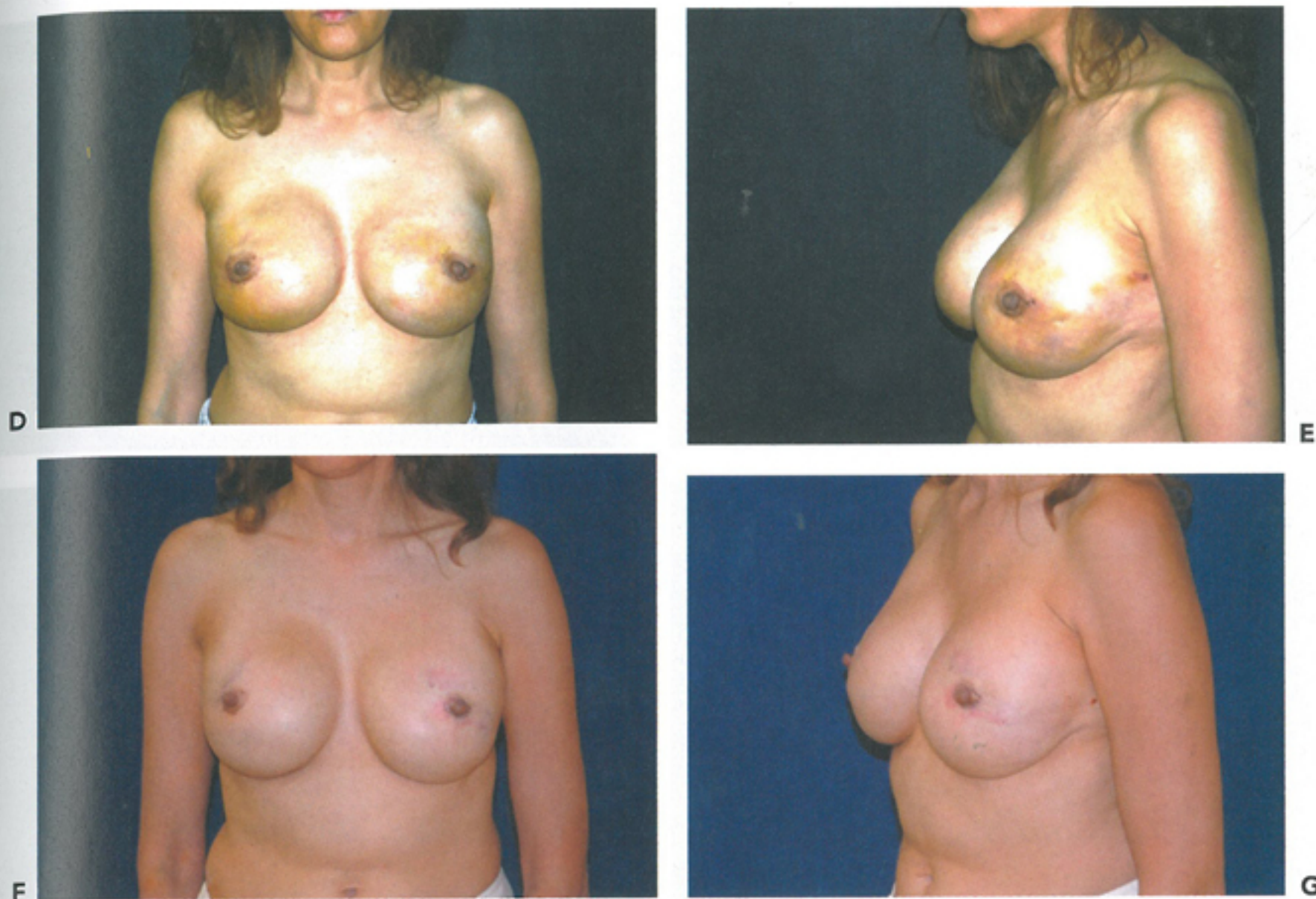


Figure 30.15. (Continued) **D:** Following bilateral prophylactic mastectomy and immediate reconstruction with Becker 50/50 implant. **E:** Early result, oblique view. **F:** Final result following injection dome removal. **G:** Final result, oblique view.

in the saline and gel-saline implants. The new adjustable gel implant offers the unique ability of using a gel implant that may be adjusted to increase projection and volume postoperatively.

The Smooth Becker 50/50 is the implant of choice for immediate breast reconstruction (see Fig. 30.14). The Spectra saline-adjustable implant is used if the tissues are tight, if there is a problem with skin flap tension, or if circulation is compromised (see Fig. 30.11A).

DISCUSSION

Because the final result of the reconstruction largely depends on the status of the tissues after the mastectomy, the general surgeon's comprehension of the reconstructive planning is

essential in maximizing the aesthetic results of this procedure. Complete muscle release and inframammary fold reconstruction allow for easier placement of the implant and less need for postoperative expansion. In addition, with muscle release, a more anatomic shape can be obtained because the tissues in the inferior pole of the breast will be thinner than the upper pole, allowing for selective inferior pole expansion.

Use of the adjustable implant often eliminates the need to replace a temporary tissue expander with a breast implant. The implant can be placed deliberately underfilled, thus decreasing tension and potential problems with large skin flaps. Overexpansion can be performed to improve shape, and size can be adjusted postoperatively to achieve symmetry.

For illustrations of a nipple-sparing mastectomy and an immediate reconstruction, see Figures 30.15 and 30.16, respectively.



Figure 30.16. **A:** Preoperative anterior view. **B:** Preoperative oblique view. (continued)

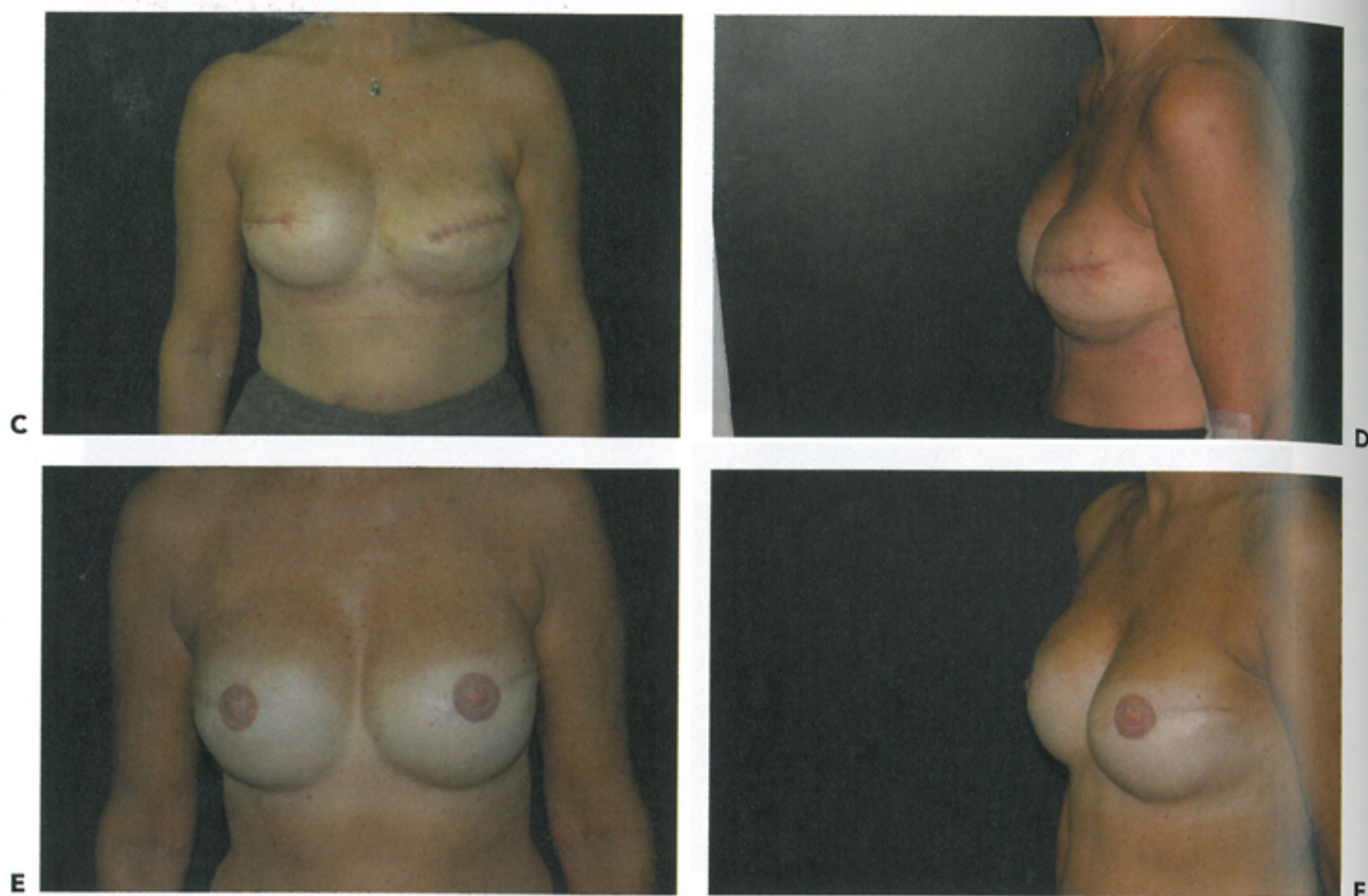


Figure 30.16. (Continued) **C:** Postoperative view following one-stage immediate reconstruction with a Spectrum implant. **D:** Early result, lateral view. **E:** Final result following injection dome removal and nipple reconstruction. **F:** Final result, oblique view.

CONCLUSION

The ideal goals of breast reconstruction are as follows:

- One-stage procedure performed at the time of mastectomy
- Minimal or no scarring
- Patient should look as good as, if not better than, before mastectomy
- No interference with chemotherapy or radiation
- Short surgical time, low complication rate, and minimal downtime

Today, these goals can be achieved in selected patients. One-stage immediate breast reconstruction can be performed in a high percentage of patients. The patients need to be carefully selected prior to surgery. The general surgeon should be familiar with both the technique of skin-sparing mastectomy and the reconstructive procedure. Adjustable implants allow for a one-stage procedure, reduce the complication rate, and allow for optimal postoperative size adjustment.

EDITORIAL COMMENTS

Dr. Becker deserves tremendous congratulations for developing the "Becker" implant. I have found this device to be useful in a variety of situations, including single-stage

reconstruction in women who have been appropriately selected. My preference is to use this implant as the permanent device following removal of a tissue expander in a two-stage reconstruction; however, its utility as a single-stage device is certainly appreciated. The ability to adjust the volume postoperatively has been a tremendous advancement, allowing the surgeon to obtain volume symmetry without having to surgically exchange the implant.

Currently, the Becker implant is available only in a round form in the United States, although a contoured or anatomic version is sold internationally. The surface of the implant comes in two varieties, smooth and textured. The smooth Becker implant is an excellent device that has delivered excellent breast ptosis. Limited personal experience with this version has so far been very favorable with high patient satisfaction. The Becker implants are currently available as a 25% or 50% device, based on the ratio of silicone gel to saline. A device that is 75% silicone gel will soon be available. The range in volume is variable, and for the Becker 25 is from 150 to 800 cc and for the Becker 50 is from 300 to 700 cc. This is important when selecting an implant of appropriate size because although the Becker 50 is the preferred implant, it may be too large for the woman with small volume requirements.

M.Y.N.

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