The SGAP flap

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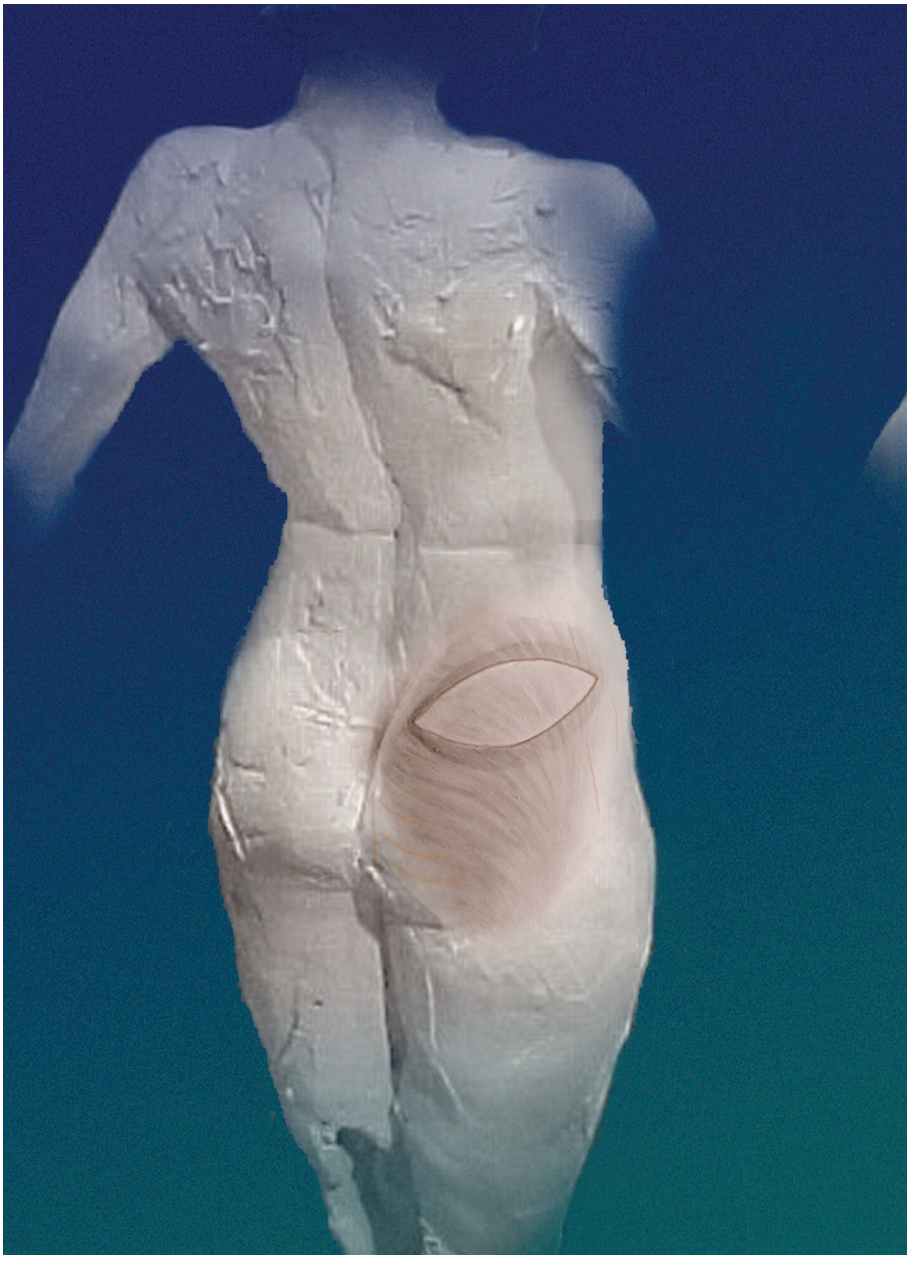

Many women confront body image issues following mastectomy. Learning to cope with these challenges while confronting one's morbidity and mortality after a cancer diagnosis can be overwhelming.[1] Feelings such as a sense of lost femininity, sexual attractiveness, and confidence often plague patients as they face the reality of what cancer has taken away.[1,2]

At this vulnerable time, patients depend on the advances of modern medicine to provide options for reconstructing their breasts and their lives. As surgical technology advances, plastic and reconstructive surgeons continue to improve the breast reconstruction process. One of the more recent methods of reconstruction that's steadily becoming more refined is the superior gluteal artery perforator (SGAP) flap. According to the U.S. Department of Labor, The Women's Health and Cancer Rights Act of 1998 (WHCRA) mandates insurance coverage of this procedure and all breast reconstruction-related procedures.

This article will describe the role of nurses in breast reconstruction, as their skills are vital to its success.[3] From the patient's first consultation with the plastic surgeon, to their intraoperative and postoperative care, we aim to explain to the patient and family members the process of breast reconstruction using the SGAP flap. The continuity of care throughout this often lengthy process remains paramount to the success of breast

for the postmastectomy patient

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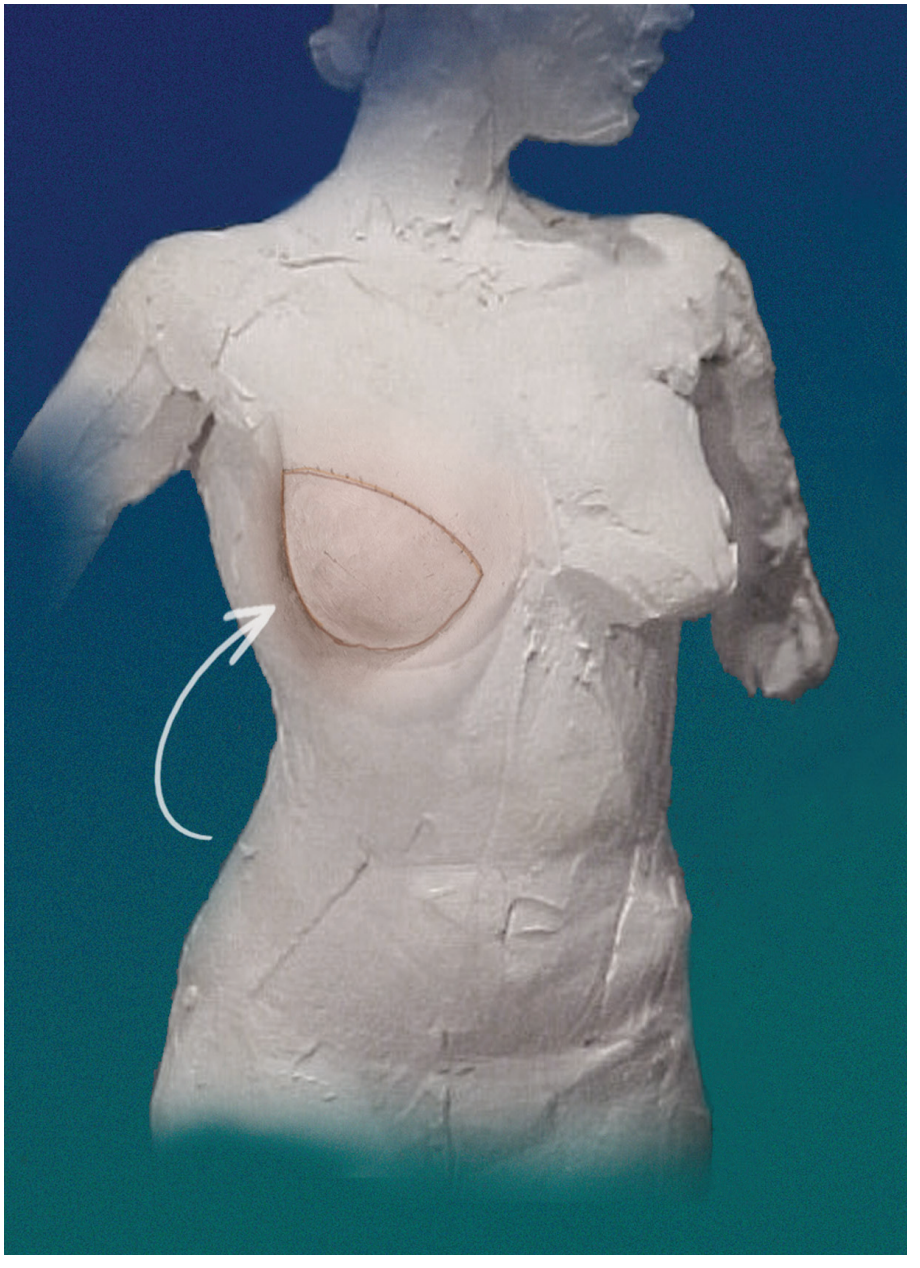


reconstruction, as well as the safety and well-being of the patient.[1]

Reconstructive options

The options for breast reconstruction include implant-based and autologous-based alternatives.[1] The faster method of reconstructing breasts, with shorter operative times and easier recoveries, involve using tissue expanders and breast implants. In general, however, these implants must be replaced when they become distorted, ruptured, or develop severe capsular contracture.[1] Therefore, some women prefer to use their own tissue for reconstruction, leaving them with softer, more realistic breasts that never need to be replaced or removed once they thrive after surgery.[1]

The options for autologous tissue flaps include pedicled transverse rectus abdominus myocutaneous (TRAM) flap, free TRAM flap, deep inferior epigastric artery perforator (DIEP) flap, latissimus dorsi flap, and the SGAP flap, among others.[1,2] The use of autologous tissue for reconstruction affords women with prior radiated breasts a softer, more realistic result with fewer risks and complications than implants.[4] For many women with excess skin and fat in the lower abdominal area, the DIEP flap is a great option as it involves a more extensive abdominoplasty while reconstructing the breast. For those who don't have excess abdominal fat and tissue or have had previous abdominal surgeries that don't allow for viability of the tissue, the SGAP

All photographs courtesy of Dr. Jaime Flores, Board Certified Plastic Surgeon, The Johns Hopkins Hospital, Baltimore, Maryland

Preoperative markings mapping perforator vessels

flap offers an opportunity to use autologous tissue for breast reconstruction.[5] Many institutions, however, don't offer all of these options because they require surgeons skilled in microsurgery and present many challenges for OR nursing staff.[4]

SGAP flap

Factors that determine reconstructive choices include the patient's size, personal preference, availability of appropriate abdominal or gluteal tissue, previous surgery to the donor or recipient areas, and prior failure of other methods of reconstruction.[1]

One of the advantages of the SGAP flap is that it avoids exposure and retraction of the sciatic nerve compared with the inferior gluteal artery perforator (IGAP) flap.[6] In addition, the consistency of buttock fat is thicker than abdominal fat, providing a more supple breast reconstruction. Even very thin patients generally have at least a small amount of skin and fat in this area.[6,7] The easily concealed donor scar provides a benefit to hesitant patients. In general, minimal fat necrosis develops, and the complete preservation of gluteal muscles allows for a full recovery and return to normal activities.[5] Contraindications for the SGAP flap include previous liposuction of the donor site and smoking 1 month or less before surgery.[5,8]

Positioning for unilateral SGAP reconstruction

The first SGAP flap procedures performed at Johns Hopkins Hospital, Baltimore, Md., only involved unilateral reconstruction. For correct positioning of the patient, a bean bag is used on the OR bed to optimize safety. A sheet is placed over the bean bag to protect the skin. Initially, the preparation of the recipient vessels or concurrent mastectomy requires that the patient be in a supine position.

As with other surgeries, anesthesia is administered, a urinary drainage catheter is placed, a cautery pad is secured, and a sequential compression device is placed on one leg. The other leg serves as a site for the blood pressure cuff for patient monitoring. Once the preparation of the recipient internal mammary artery and vein concludes, the position of the patient changes to a lateral decubitus position with the bean bag. Suction then pumps into the bean bag to anchor the patient safely in place. Pillows placed between the patient's knees and ankles protect these pressure areas, and an egg crate protects the patient's heel. A safety strap secures the patient above the knees. With all safety measures in place, the SGAP flap harvest can begin from one side of the buttocks. At the conclusion of this stage, the buttock is closed, and then the patient returns to supine position for reanastomosis of the vessels and flap placement.

This flap utilizes only the skin and fat from the upper buttock, sparing the gluteal muscle. Since it can be harvested from each buttock, the operation can be performed twice. Major complications include flap loss (1% to 5%, compared with 1% to 3% in DIEP flap), seroma formation at the harvest site (20%), and a possible contour abnormality of the buttock.[8] This may require revision surgeries including dermato-fat grafting, scar revisions, or liposuction.[9]

Special considerations for the bilateral SGAP flap

In the past, technical and positioning challenges have prevented many institutions with trained microvascular surgeons from performing bilateral SGAP flaps.[10] When preparing for this surgery at the authors' institution, multiple considerations arise for both the OR nursing staff and the physician staff. Concerns include patient positioning, special equipment needs, and personnel needs. Every surgical procedure warrants excellent teamwork for success, but this particular microsurgical operation demands flawless collaboration between the surgeons and nurses involved in the case.

One of the main concerns for OR nurses is positioning the patient. Determining how to dissect the flaps from the buttocks while preparing

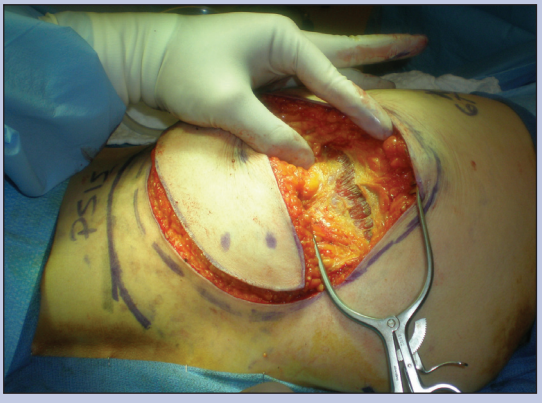
the mastectomy site for anastomosis presents a particular challenge. Positioning the patient so that the donor site can be closed without lying her on the newly reconstructed breasts is also a major challenge. Timing factors into the equation when considering ischemia of the flaps. The shortest ischemic time of the flaps produce the best chance for viability of the reconstruction, but this creates a challenge for the surgeon closing the donor site and completing the anastomosis of the arteries and veins.

Our first few cases utilized one OR table and the patient's position was changed during the case. We found it was more efficient to use two operating tables. The procedure began by placing the patient supine on the operating table, positioned on a therapeutic overlay with a pillow under the knees and arms on armboards or tucked at the side. The arrangement of the arms depended on whether the procedure was a simultaneous mastectomy or if implant or tissue expander removal was necessary. A safety belt then secured the thighs and a forced-air warming device helped cover both legs for warmth.

The procedure

The surgery begins with skin prep, draping sterile sheets, and the time-out procedure that identifies the patient with the signed operative consent and identification band. The correct procedure and surgical site is verified by the surgeon, anesthesiologist, and circulating nurse. Allergies are reviewed, antibiotics are given, and any concerns with equipment and issues specific to the procedure are discussed. At that time, the incision is made for the mastectomy or for removing implants as necessary. Bilateral partial rib resections of the third or fourth rib allow for dissection to the internal mammary arteries and veins. A sterile, saline-moistened lap sponge and 4x4 sponges are placed into each breast cavity and covered with antimicrobial surgical incise drapes with an iodophor impregnated adhesive. This protects the exposed field and maintains sterility while the patient is in a prone position for the SGAP flap dissection. For this portion of the procedure, the patient requires a face pillow, chest rolls, egg crates, and a safety strap for protection while prone. Arms remain at the side while one forced-air warming device covers the legs and a second warms the back, head, and arms. A Doppler confirms the location of the perforator arteries mapped by the markings drawn prior to surgery.[8,11] This allows for any necessary adjustments to the markings now that the patient's position has changed. The two surgical teams of attending surgeons and residents can then dissect the bilateral superior gluteal flaps simultaneously. At the conclusion of the flap dissections, the surgeons detach them and the timing of flap ischemia begins. As the flaps lay on a small table, the attending surgeons remove some epithelial tissue and prepare for the anastomosis to the chest vessels. Preparation for this vital portion of the procedure requires microsurgical instruments and the high-powered microscope.

Dissecting the SGAP flap



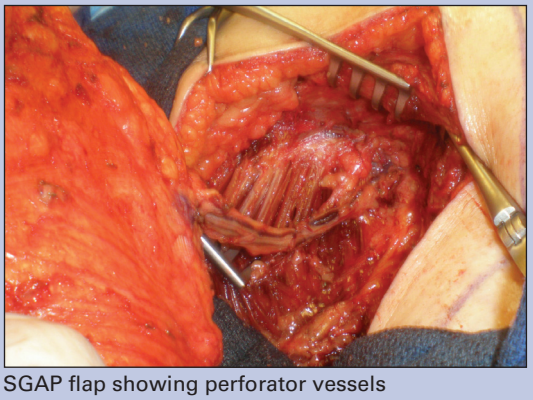
While the flap preparation takes place away from the patient, the rest of the surgical team undermines the tissues at the buttocks and completes primary closure of the area. The nursing staff account for all sponges and sharps at this time. When the primary closure of the buttock incisions concludes, the patient is repositioned to supine. Except for the scrub person, the perioperative team assists with the repositioning of the patient. Once safely supine, the usual prepping and sterile draping of the patient occurs, the surgeon removes the antimicrobial adhesive drape and prepares the area with povidone-iodine.

The attachment of the flaps to the chest must take place under a microscope to properly visualize the vessels.[8] The vein attachment requires a coupler device and the artery utilizes a 9-0 nylon suture for anastomosis. The surgeons carefully and artistically mold the flaps to form a breast shape as they insert them into the skin pocket prepared previously following the mastectomies. The buttock skin must be trimmed to fit the size

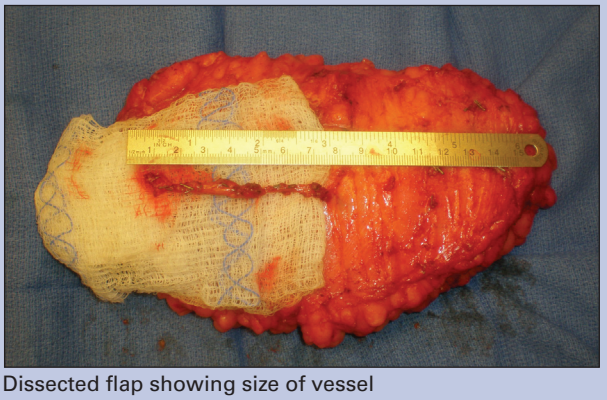
Pre- and intraoperative care plan

	Assessment	Planning	Implementation	Evaluation
Knowledge	Patient/family readiness to learn	Identify accurate operative consent, allergies, NPO status, psychological support, and questions from patient/family.	During the preoperative visit, check operative consent for accuracy, determine patient allergies, N.P.O. status, and answer questions from patient/family. Provide psychological support as needed.	Operative consent is accurate and all questions are answered satisfactorily. Patient and family are comfortable proceeding with surgery.
Physiological	To prevent possible loss of body heat	Keep patient warm.	Apply warm blankets as soon as patient enters OR. Apply lower/upper body forced-air warming device on patient for duration of procedure. Observe OR temperature.	Patient is warm as evidenced by anesthesia temperature monitoring and nursing clinical assessment.
	To prevent skin and tissue trauma	Protect skin and bony prominences during multiple position changes. Have essential positioning supplies in room.	Unilateral SGAP flap: – Bean bag with sheet covering it – Eggcrate on armboards – Pillows between thighs, ankles, feet – Eggcrate under feet – Large safety strap to fit patient in lateral position – Sequential compression stockings and device Bilateral: –Two tables in the OR –Therapeutic overlay on both beds – Face pillow – Chest rolls – Sequential compression stockings and device	No physical injury to patient. No evidence of skin breakdown, redness, or blisters.
Safety	To maintain body alignment during positioning	Involve all team members (except for scrub role) in sequence for repositioning for the various phases of surgery.	Communicate to all team members prior to moving patient to maintain body alignment.	No physical injury to patient.
	To minimize operative time	Anticipate surgeon's needs.	Coordinate team efforts by flawless collaboration. Have essential supplies in the room (as stated above).	No physical injury to patient.

Perforated vessels in the SGAP flap



SGAP flap showing perforator vessels



Dissected flap showing size of vessel

of the breast pocket, leaving a skin flap that's used for monitoring flap viability.

As OR nurses, the earliest cases of bilateral SGAP flap procedures in the author's facility brought numerous challenges. The position changes provided some of the greatest challenges. After many difficult cases, a two-table approach is now utilized during bilateral SGAP flap procedures, including one for the supine position and another for the prone position. When repositioning, the tables may sit side-by-side to ease the process. Using two operating tables decreases the number of table transfers because it's no longer necessary to transfer from table to stretcher and back to the table each time a position change is required. This allows for better organization and improved safety while the patient is under anesthesia. Transfer and set-up time of the sterile field were also decreased, improving efficiency of the procedure.

At Johns Hopkins Hospital, Baltimore, Md., the bilateral SGAP flap procedure requires two attending surgeons skilled in microvascular plastic surgery in addition to at least two senior plastic surgery residents. This team, in conjunction with two to three RNs and one to two surgical technologists, ensures safe, efficient, and timely care of the patient. This detail-oriented procedure, which requires operating on both sides of the body simultaneously, can only take place with a team that works well together toward the common goal of patient safety.

Postoperative care

Communication between caregivers is a major factor in the success of this surgery. Specialized plans of care are incorporated as soon as the patient arrives in the recovery area of the authors' facility. The surgeons educate the nurses caring for the patient on where to find the point of anastomosis for evaluation of the Doppler signal.[11] Nurses on the surgical unit carefully monitor the flap hourly for the first 24 hours, every 2 hours for the following 24 hours, then every 4 hours for the remainder of the patient's hospital stay. The nurse will immediately notify the residents and attending surgeon if there's any change in the flap's viability to ensure prompt intervention when required. Patients may eat, get out of bed, and begin to ambulate the morning after surgery. Physical therapy staff assess the patients and teach stretching and strengthening exercises for them to perform at home during recuperation. On the third postoperative day, patients may return home for the remainder of their recovery, which will last 4 to 6 weeks.

Positioning after a surgery with incisions on both sides of the body presents another obstacle. The newly reconstructed breasts with a fresh anastomosed artery and vein force the patient to remain supine when lying down for several weeks. We have found that minimizing hip flexion in the first week following surgery proves crucial to preventing dehiscence of the donor site incision. The surgical drains, generally at least one in each donor site and at least one in each breast, can also make the patient uncomfortable. However, pain levels are generally lower than those of DIEP flap patients with regard to donor site discomfort.[8,9]

Drain removal can begin when the patient returns to see the outpatient nurse practitioner 1 to 2 weeks following surgery.[8] When the drainage falls below 30 mL per drain in 24 hours, the risk of

seroma greatly decreases. The buttock drains tend to stay in longer than the flap site due to the higher output of serous fluid from the larger area of the donor site.[8] Once the patient heals well from the surgery, all restrictions are removed approximately 6 weeks postoperatively and the patient can return to normal activity. The patient follows up with the plastic surgeon at 6 weeks and at 3 months. Revisions such as symmetry procedures, dermatofat grafting, scar revision, and nipple reconstruction can take place between 3 and 6 months, depending on whether or not the patient was irradiated.[1,5,8,10]

Advocating for the patient

The job of an OR nurse requires attention to detail and a great deal of patient advocacy during a time when they are unable to advocate for themselves. The procedure includes a long and occasionally difficult recovery from a 10- to 14-hour surgery that often involves an emotional and physical transformation. The SGAP flap procedure rebuilds confidence and a sense of femininity often lost after mastectomy.[1] For that reason, perioperative nurses should continue to make strides to improve efficiency, decrease flap ischemia time, and increase flap success rates. **OR**

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