

Perspectives

Recovery Strategies from the OR to Home

In This Issue

Breast cancer remains the number one cancer among women in the United States, accounting for 32% of all cancers in women. Most women are presented with surgical treatment choices: lumpectomy, a breast-conserving option, or mastectomy. A mastectomy may be necessary because of a number of factors. After a mastectomy, a woman may choose to have breast reconstruction surgery either with an implant or with autologous tissue. The transverse rectus abdominis myocutaneous (TRAM) flap has become the "gold standard" for breast autologous reconstruction. Based on her extensive clinical and personal experience with the TRAM flap procedure, Ms. Dell describes different surgical techniques, postoperative complications, and nursing interventions.

Liposuction is the most commonly performed cosmetic procedure in the United States. It is also referred to as liposculpture, lipoplasty, and suction-assisted lipectomy. Initially, liposuction surgery required blood transfusions because blood loss in the aspirate was significant. Dr. Jeffrey Klein, a dermatologic surgeon, is credited as the originator of the tumescent technique that minimized blood loss and risks of general anesthesia. In his article, Dr. Klein describes the recent modifications in techniques for post-liposuction care to help minimize bruising and swelling and expedite recovery time.

Advisory Board

Cheryl Bressler, MSN, RN, CORLN

Oncology Nurse Specialist, Oncology Memorial Hospital, Houston, TX

Lois Dixon, MSN, RN

Adjunct Faculty, Trinity College of Nursing, Moline, IL
Pulmonary Staff Nurse, Genesis Medical Center, Davenport, IA

Jan Foster, RN, PhD, MSN, CCRN

Asst. Professor for Adult Acute and Critical Care Nursing
Houston Baptist University, TX

Mikel Gray, PhD, CUNP, CCCN, FAAN

Nurse Practitioner/Specialist, Associate Professor of Nursing,
Clinical Assistant Professor of Urology, University of Virginia,
Department of Urology, Charlottesville, VA

Victoria-Base Smith, PhD(c), MSN, CRNA, CCRN

Clinical Assistant Professor, Nurse Anesthesia,
University of Cincinnati, OH

Mary Sieggreen, MSN, RN, CS, NP

Nurse Practitioner, Vascular Surgery, Harper Hospital, Detroit, MI

Franklin A. Shaffer, EdD, DSc, RN

Vice-president, Education and Professional Development,
Executive Director, Cross Country University

Postoperative recovery after TRAM flap surgery

By Deena Dell, RN, MSN, AOCN, BC

Breast cancer remains the number one cancer among women in the United States. About 211,440 new cases will be diagnosed in 2003. Breast cancer accounts for 32% of all cancers in women and 15% of all cancer-related deaths.¹

When diagnosed with breast cancer, most women are presented with surgical options. These options depend on tumor size, number of tumors, lymph node status, comorbid conditions, and biopsy results. Women may be given a choice between breast-conserving surgery (lumpectomy) and breast removal (mastectomy). Mastectomy may be necessary due to large tumor size, multiple tumors, extensive ductal carcinoma in situ (DCIS), inability to get clear margins after a lumpectomy, or a physical disability or comorbid condition, such as scleroderma, that prohibits radiation therapy.

After choosing a mastectomy, women need to decide whether to have reconstructive surgery. Once chosen, they must decide on the type of breast reconstruction (e.g., implant or autologous tissue) and whether this surgery should be immediate or delayed. These decisions are highly personal and may be affected by their self-image and view of their sexuality, fear of breast cancer, past experiences with other breast-cancer patients, and other beliefs.

TRAM flap

The purpose of breast reconstruc-

tion is to offer the psychological benefits of a better quality of life, better body image, and less anxiety and depression.

In the early 1980s, Dr. Carl R. Hartrampf, Jr., described a pedicled flap for breast reconstruction after a mastectomy. Since that time, the transverse rectus abdominis myocutaneous (TRAM) flap has become the "gold standard" for breast autologous reconstruction.²

The TRAM flap results in a reconstructed breast that is more realistic in appearance and feel than an implant. This procedure may be considered after mastectomy for any patient who has adequate abdominal tissue and is psychologically motivated to deal with the arduous recovery period. Ideal candidates are in good physical health, do not smoke, and have had no previous or limited abdominal surgery that did not interrupt the blood supply to the abdominal region to be used for the TRAM flap. Smoking, obesity, or diabetes may disqualify a candidate from TRAM surgery.³

The TRAM flap may be favored over implants if the patient has a previous large defect due to a radical mastectomy, has had radiation to the chest wall, is large breasted, has experienced failure of implant reconstruction, or wants an abdominoplasty.⁴

The abdomen is the most suitable donor site. The patient needs enough extra lower or midabdominal skin and subcutaneous fat to create and shape a



Continued on page 5

Post-liposuction Care: Open Drainage and Short-term Compression

By Jeffrey Klein, MD

For postoperative care, open drainage provides significantly more patient comfort and accelerates healing, compared to older techniques that place sutures in all incisions. It decreases the time that surgeons need to devote to handholding after liposuction with tumescent local anesthesia (TLA). Open drainage is also used in leg-vein surgery.

The goal of post-liposuction care is to minimize swelling, bruising, discomfort, and recovery time. Recent modifications in techniques for post-liposuction care have significantly reduced the discomfort and time that patients must wear post-liposuction compression garments. Open drainage maximizes postoperative drainage of residual blood-tinged tumescent solution. This simple technique reduces the risk of postoperative seromas, swelling, and bruising.

Modern liposuction uses TLA to achieve dramatic surgical hemostasis and profound local anesthesia. TLA requires large volumes of extremely diluted lidocaine and epinephrine which, when infiltrated into the targeted subcutaneous fat prior to liposuction, produces profound capillary vasoconstriction and prolonged postoperative analgesia. The infiltration of large volumes of TLA into subcutaneous fat causes the affected areas to become briefly tumescent (swollen and firm). The profound hemostasis provided by TLA has eliminated excessive surgical bleeding and the need for autologous blood transfusions, which are common aspects of non-tumescent liposuction.

Local or general anesthesia

To achieve optimal local anesthesia before liposuction, surgeons must use large amounts of tumescent fluid. Such large volumes result in profound surgical hemostasis and reduced bruising, swell-

Modern liposuction uses TLA to achieve dramatic surgical hemostasis and profound local anesthesia.

ing, and soreness. Among the prerequisites for optimal tumescent local anesthesia are the:

- use of large volumes of TLA solution
- need to wait 30 to 60 minutes after infiltration to attain optimal anesthesia

For liposuction under general anesthesia, surgeons tend to use smaller volumes of tumescent fluid, leading to more surgical bleeding and a need for longer use of postoperative compression garments.

Surgeons who do liposuction totally by local anesthesia must use large volumes of TLA and wait at least 30 minutes after infiltration before starting liposuction in order to achieve optimal local anesthesia. In contrast, surgeons who use general anesthesia for liposuction tend to:

- use smaller, suboptimal volumes of TLA solution
- begin liposuction almost immediately after infiltration

Surgeons have some incentives for using general anesthesia. Firstly, local anesthesia is not necessary for intraoperative patient comfort. Secondly, when paying an anesthesiologist to provide general anesthesia, surgeons want to begin liposuction immediately after completing the tumescent infiltration.

When fat is maximally tumescent, it is difficult to perform liposuction. Rather than wait 30 to 60 minutes for detumescence to occur, most surgeons simply use less tumescence. However, the net effect of suboptimal tumescent infiltration may be greater post-liposuction bruising, swelling, pain, and recovery time.

Open drainage

Open drainage can improve and accelerate post-liposuction recovery. This technique can also be used after leg-vein surgery and tumescent local anesthesia. Tumescent liposuction or leg-vein surgery always causes a certain amount of subcutaneous bleeding and damage to subcutaneous lymphatic capillaries. Liposuction and leg-vein surgery without complete tumescent infiltration unnecessarily leads to subcutaneous bleeding, which in turn augments postoperative inflammation.

Closing incision sites with sutures prevents residual subcutaneous blood-tinged anesthetic solution from draining. Excessive amounts of osmotically active blood-tinged fluid, trapped in the subcutaneous space, further augment post-liposuction inflammation. Under these circumstances of suboptimal hemostasis and impaired drainage, swelling increases, and it becomes necessary to use postoperative high-compression garments for weeks instead of days.

Adits

Adits are tiny, round holes made by 1.0- to 2.0-mm skin biopsy punches to facilitate open drainage. More precisely, adits are the mouths of tiny tunnels, made by microcannulae, that lead from deep fat deposits to the skin surface. These tiny, round holes leave virtually no scars. Adits tend to remain open longer and allow for better drainage than tiny linear incisions. Linear incisions are less efficient, because

they tend to close before drainage is complete.

Tumescent liposuction uses open drainage to maximize the natural removal of blood-tinged anesthetic solution. Adits are placed strategically to encourage gravity-assisted drainage. Open drainage precludes the use of sutures to close incisions.

Super-absorbent pads

One potential disadvantage of open drainage is the inconvenience of messy, pink drainage leaking onto the patient and his or her surroundings. To avoid this problem, it is necessary to use special super-absorbent pads which function as a combination of sponge and compression pad. The sponge absorbs the postoperative blood-tinged drainage and prevents the staining of clothing or furniture, while the pad helps to distribute compression uniformly. These super-absorbent pads are held in place by a postoperative compression garment worn by all liposuction patients.

Super-absorbent pads are similar to disposable diapers but have more than twice the absorptive capacity. They transfer and redistribute the force of an elastic compression garment more uniformly, reducing the degree of postoperative bruising.

Because the pads are slightly bulky, some surgeons prefer to use compression garments specifically designed for open drainage with super-absorbent pads.

Reston® foam

Some surgeons apply Reston® foam to the patient's skin after liposuction. It is an adhesive-backed, closed-cell foam that, according to manufacturer 3M Corporation, is not intended to be applied directly to the patient's skin. Reston® is an excellent product to prevent bed sores, when used as directed for cushioning the surfaces of beds or wheelchairs. However, attaching the adhesive side of Reston® foam directly to a patient's skin has been associated with post-liposuction infections, scarring, and skin necrosis. Adhesive foam must remain on the skin for several days after liposuction, preventing showering. In contrast, patients who use super-absorbent pads are instructed to remove them before showering, then replace the pads once or twice daily.

A post-liposuction compression garment that allows adjustable compression is desirable.

Short-term compression

The long-term use of high-compression garments is now regarded as antiquated and unnecessarily uncomfortable. With open drainage for post-liposuction care, patients need only wear a high-compression garment for a few days. On average, patients wear high-compression garments for only three to seven days. With open drainage, garments are discontinued 24 hours after all drainage has ceased. Nevertheless, some patients continue to wear moderately compressive post-liposuction garments for an additional week or two because of the security and comfort that a garment can provide. Patients who discontinue wearing a high-compression garment before all drainage has ceased may experience prolonged drainage, recurrent drainage, or seroma formation. With open drainage and appropriate postoperative compression, the risk of a post-liposuction seroma is almost zero.



Fig. 1. Adjustable abdominal binder with Velcro® closure. (Dale Medical Products)

Use of high-compression garments

Prolonged use of high-compression garments occurred in the late 1970s and early 1980s, the early days of liposuction. The role of prolonged high compression after liposuction has never been validated by comparative scientific studies. It is only necessary when drainage is hindered by closing the incisions with sutures. Excessive continuous external compression may actually impede lymphatic drainage and exacerbate postoperative edema. No objective clinical evidence supports or justifies the standard technique of closing all liposuction incisions with sutures, then making the patient wear a high-compression garment for two weeks or more.

Bimodal compression involves two phases: the drainage phase and post-drainage phase. High compression is applied immediately after liposuction to encourage drainage from adits. With open drainage and high compression, the tumescent drainage usually stops in one to four days. During the post-drainage phase, only a mild degree of compression is needed. It gives the patient a sense of security during physical activity as well as a gentle degree of analgesia and comfort.

Special liposuction garments

A post-liposuction compression garment that allows adjustable compression is desirable, because it maximizes drainage and minimizes postoperative swelling, bruising, and pain.

The degree of compression ought to be as high as possible without causing discomfort or compromising respiration, especially during the first 12 hours after tumescent liposuction. However, it is not unusual for a comfortably high degree of compression to become painful later, so maximal compression demands an adjustable garment. Traditional liposuction garments do not allow caregivers to adjust the degree of compression.

For the abdomen, hips, waist, or breasts, one of the most efficient liposuction garments is an adjustable abdominal binder with Velcro® closure (Fig. 1).

Compression after liposuction of thighs or hips requires a different type of design. Too much compression on the thighs may cause distal stasis and predispose the patient to thromboembolism. One style of garment designed for thigh and hip compression is actually two gar-

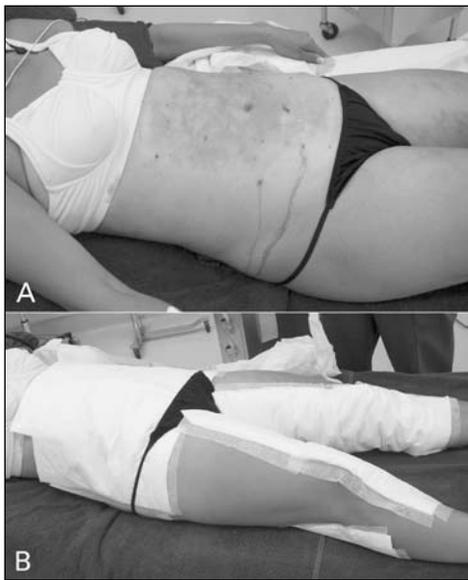
ments; one is worn over the other. When the two garments are worn simultaneously, one atop the other, they provide additive degrees of compression. Together, the two moderately compressive garments provide a degree of compression that is equally as effective as a single high-compression garment, but they are much easier for patients to put on, one after the other, without assistance.

Less discomfort and edema

The use of adits has dramatically reduced the discomfort and time required for recovery after liposuction. Before the advent of open drainage, liposuction surgeons used large cannulas and made large incisions, which were closed with sutures. Tumescent local anesthesia made it possible to use microcannulas and tiny adits without sutures, thus allowing open drainage.

Together with the hemostatic effects of epinephrine, open drainage has essentially eliminated the high incidence of post-liposuction hematomas and seromas. Open drainage reduces inflammation, swelling, and edema by decreasing the accumulation of blood-tinged, inflammatory tumescent fluid in subcutaneous tissues.

After post-liposuction edema has occurred, it is difficult to hasten its reso-



A. Immediate postoperative view of patient after tumescent liposuction of abdomen and medial thighs/knees totally by local anesthesia. Note copious drainage of residual blood-tinged anesthetic solution.

B. Patient with HK Pads (HK Surgical) placed over areas treated by liposuction in order to absorb drainage of tumescent anesthetic solution.

The use of adits has dramatically reduced the discomfort and time required for recovery after liposuction.

lution. The best way to deal with edema is to prevent it. Open drainage does not eliminate all post-liposuction edema. Patients should expect a mild degree of edema to appear after open drainage has ceased. The continued use of mild-compression garments for days and weeks after all drainage has stopped does not eliminate this edema but can reduce it on a day-to-day basis. Mild edema gradually lessens over a period of several weeks with or without continued compression.

Adits and large cannulas

Many surgeons prefer to perform liposuction with large cannulas. Larger liposuction cannulas often require large incisions that need sutures for closure. This surgical technique can easily incorporate the use of adits. Typically, adits are placed and microcannulas are used prior to liposuction with a larger cannula. Surgeons tend to place large sutured incisions in body regions where a potential scar will have minimal visibility. Adits, which soon become invisible, can be placed randomly on the skin, overlying the fat compartment that is targeted for liposuction.

One concern about the use of adits is the potential for visible scars. In patients with relatively light pigmented skin of Fitzpatrick Type I and Type II, adits will become virtually invisible. With a few precautions, adits can be used in individuals with darker skin. Firstly, the smallest number of adits should be used. Secondly, when using a microcannula to create tunnels leading to an adit, the surgeon must take care to avoid abrading the surround-

ing skin. Traumatizing the skin around an adit may result in a visible degree of post-inflammatory hyperpigmentation.

With minimal effort, the use of adits can dramatically improve the postoperative recovery of all liposuction patients. Using adits allows any surgeon to speed postoperative recovery and reduce post-liposuction edema.

Benefits of no sutures

One of the biggest advantages of adits is the elimination of sutures to close incisions. Small unsutured incisions heal with less scarring by avoiding suture-induced inflammation and cross-hatch scars. In addition, surgeons can save considerable time by not having to see patients to remove sutures. Follow-up visits at one week after liposuction rarely have any significant clinical function other than suture removal. When sutures are not used, there is no need for an immediate follow-up visit. In most cases, the all-important follow-up communication with patients during the first month after liposuction can be performed by the nurse. By the time that patients return for a routine 6-week postoperative visit, swelling has resolved and postoperative photographs can be taken.

Bibliography

1. Lawrence N, Butterwick KJ. Immediate and long-term postoperative care and touch-ups. In: Narins RS, ed: *Safe Liposuction and Fat Transfer*. Marcel Dekker, Inc. New York 2003, pp 329-341.
2. Klein JA. Post-liposuction care: open drainage and bimodal compression. In: *Tumescent Liposuction: Tumescent Anesthesia & Microcannular Liposuction*. Mosby, St. Louis, approx 500 pages. March, 2000, pp281-293.
3. Klein JA. Tumescent liposuction and improved postoperative care using Tumescent Liposuction Garments™. *Dermatol Clinics* 1995,13:329-338.
4. Straudinger P. Compression therapy: low or short stretch bandage and graduated compression stockings for leg edema. (letter) *Dermatol Surg* 1995,21:106.

Jeffrey Alan Klein, MD, MPH, earned his MPH at the University of California, Berkeley; he received his MD from the University of California, San Francisco. He is currently in private practice in dermatology, specializing in dermatologic and cosmetic surgery. Dr. Klein is also an associate clinical professor of dermatology at the University of California, Irvine. He has published extensively on a variety of topics in plastic surgery and dermatology and his current articles focus on tumescent liposuction.

Postoperative recovery after TRAM flap surgery – Continued from page 1

breast mound. The TRAM flap may be transferred as a pedicled flap, which is tunneled under the skin, or done as a free-tissue transfer.

The pedicled TRAM flap receives its blood supply from the superiorly based epigastric system of the internal mammary vessels. The entire rectus abdominis muscle is used.

In the free TRAM flap, the lower abdominal skin and fatty tissue are removed, along with a small portion of the lower rectus abdominis muscle with its perforators (i.e., blood vessels that connect superficial to deep blood vessels). The deep inferior epigastric vessels supply these perforators. The flap is transplanted to the mastectomy site with microvascular techniques.

A newer version of the free flap is the deep inferior epigastric perforator (DIEP) flap. Skin and fat, along with their perforators, are taken from the lower abdomen. No muscle is removed. The nerves that provide sensation to the transplanted abdominal skin and fat are transected in either procedure.⁵

The major disadvantage of the TRAM flap is abdominal wall morbidity, including herniation. There is sacrifice of the entire rectus muscle in the pedicled flap. A portion of the rectus abdominis is conserved in the free TRAM flap procedure and the entire muscle is spared in the DIEP flap.

Many argue that the free TRAM flap or DIEP flap is a better procedure, because it causes less abuse to the abdominal wall. However, studies have shown that the functional effect of the forfeit of the entire rectus muscle seems to be as well tolerated by most patients as a partial forfeit after 6 months to a year.^{2, 6-8}

Surgical risks

Patients face the usual surgical risks of infection, atelectasis, and deep vein thrombosis. Furthermore, the extensive undermining required for the surgery puts the patient at risk for skin and abdominal flap necrosis, seroma, hematoma, and fat necrosis. Any condition that impairs blood flow can lead to partial or complete flap loss.^{9, 10}

Postoperative care

Immediate postoperative assess-

For free TRAM patients, flap checks should be done hourly the first 48 hours.

ment for the free TRAM patient includes hourly flap checks.¹¹ The breast flap should be assessed for color, warmth, capillary refill, and arterial and venous blood flow as well as erythema, drainage, signs of infection, and approximation of wound edges.¹¹

The reconstructed breast may be a different color from the contralateral breast, as the abdominal tissue used for the flap is a different color than breast tissue. Dark redness of the flap may indicate obstruction to venous outflow. A pale or mottled breast may indicate poor arterial blood flow. Petechiae can reflect poor venous return, while bruising is probably normal.

Warmth is assessed by using the back of the index finger. At this time, the nurse can assess excessive swelling or seromas that may require aspiration. Some surgeons believe that heat improves the circulation by dilating blood vessels,



Fig. 1. Post-surgical bra with Velcro® closure. (Dale Medical Products)

so they may order the room to be kept at a certain temperature or ask that a warm, dry towel or warm, air-circulating blanket be left on the patient for a period of time.

Capillary refill should be assessed by applying light pressure on the flap for one second with a finger or cotton-tipped applicator. Color should return within 1 to 3 seconds. A faster return indicates venous congestion, while a slower return indicates poor arterial flow.

Checking the blood flow of the flap with Doppler ultrasound may detect an audible decrease in tissue perfusion before visible changes are apparent. It is an important tool to use in the assessment of free TRAM flaps, particularly in non-white patients. The surgeon usually indicates where arterial and venous pulsation should be checked by placing a colored suture at the site.

Flap assessments should be done hourly for the first 48 hours after a free TRAM. Monitoring can then proceed to every 2 hours for 24 hours, then every 4 hours for 24 hours, then every 8 hours. The pedicled flap only needs to be monitored every 4 hours. The application of a post-surgical bra with a front Velcro® closure may facilitate inspection of the surgical site (Fig. 1).

The surgeon should immediately be notified of any changes. More IV fluid may be sufficient to increase circulation but often a return to the OR for revisions is necessary.

Ineffective gas exchange is a definite consideration in the postoperative patient with a TRAM flap. Postsurgical tightening compresses the abdominal wall and causes diaphragmatic restriction. Postoperatively, the patient must be placed in a flexed position to prevent wound dehiscence, further contributing to this restriction. The use of an abdominal binder may encourage patients to breathe deeply after abdominal surgery (Fig. 2).

Incisional pain often inhibits the patient from taking a deep breath. Pulmonary toilet is extremely important to prevent atelectasis, bronchiectasis, pneumonia, and pulmonary embolism.

Preventing a fluid deficit is important, as adequate hydration is necessary to ensure adequate flap perfusion. IV fluid replacement is necessary until the patient is able to tolerate oral fluid satisfactorily. Fluid boluses should be used in the case of hypotension. Vasopressors should never be administered, especially in the

free TRAM, unless absolutely necessary, as they can cause ischemia and flap-cell death.

Diet should be advanced slowly. Tightening of the abdominal wall and flexed position may restrict stomach volume. Emesis needs to be prevented, as it may stress the reattached musculature and contribute to abdominal wall dehiscence. Anti-emetics should be readily available.

Prevention of deep vein thrombosis is essential. Positioning with the hips flexed postoperatively increases the risk for this complication. Patients need to be taught to wiggle their toes and exercise their legs every hour.

On postoperative day one, patients should be out of bed to the chair. Ambulation should begin on day two. Sequential compression devices should be used. Abdominal binders can give patients the confidence to ambulate without the fear of causing additional trauma to the abdominal wall.

Narcotics are required immediately after surgery for pain control. In addition to postoperative pain from mastectomy surgery, women may complain of tightness, pulling, and numbness in their abdominal and rib cage area as well as back pain after breast reconstruction. Patients with preexisting back pain may find that it is exacerbated after the procedure.

Patient-controlled analgesia is the administration method of choice so that patients can maximize pain relief and minimize side effects. Morphine sulfate or hydromorphone (Dilaudid®) are the pre-



Drainage bulb holder

Patients need to be able to strip and empty drains before discharge.

ferred drugs.

Correll et al¹² have found that epidural analgesia provides better pain control than intravenous analgesia. However, many institutions have found that intravenous analgesia provides acceptable pain relief. Ketorolac (Toradol®), a nonsteroidal anti-inflammatory drug (NSAID) is often added to potentiate the actions of narcotics. Sharma et al¹³ have reported a decrease in morphine requirements in patients who received intravenous ketorolac with, importantly, no increase in hematomas.¹⁴

Extensive patient education is critical. Education about drain care can begin on postoperative day 1 with demonstrations. Patients need to be able to strip and empty drains before discharge. Commercially available drainage bulb holders (Dale Medical Products, Inc.) can provide patients with an easy-to-use securement system. The holder can accommodate up to four drainage bulbs and allows for quick and easy bulb drainage.

Women should be given a pillow, so that they can elevate their arm when lying in bed or sitting in a chair. Upper extremity range-of-motion exercises to prevent muscle contraction as well as lymphedema (if lymph nodes have been removed) need to begin no later than day 3.¹⁵

At discharge

Before patients are discharged, they should be switched to an oral narcotic, such as oxycodone with acetaminophen (Percocet®). Oral NSAIDs, such as rofecoxib, may be used to augment these drugs. Eventually the patient may be able to switch to the NSAID for around-the-clock use and use the narcotic only as needed. Narcotic-induced constipation can be avoided with the use of gentle laxatives and stool softeners.

Patients will be out of work for 6 to 8 weeks after this surgery and substantial pain may last for quite a while. Full recovery (i.e., “back to normal”) may take 6

months to a year.¹⁴

Activities and exercises after TRAM flap surgery need to be discussed in detail. Once at home, patients can shower with mild soap and water. Patients need to be taught how to care for incisions, and they need to know what signs and symptoms of infection to report.

Patients should be instructed not to sleep by lying flat on their abdomen or on the operated side for at least 2 weeks. A soft bra with cups and no wires may be worn at all times for support (except when bathing). There are specially manufactured post-surgical bras that offer support and comfort during the recovery period. Initially, the patient needs to stay bent forward at the waist for 10 days to prevent wound dehiscence. She should avoid spinal twisting during all activities, including getting into and out of bed. Log rolling should be taught.

Walking, including climbing stairs, is encouraged after discharge. Nothing weighing more than 5 pounds can be lifted for 6 to 8 weeks. On postoperative days 11 to 28, the patient may gently bend backward and twist toward either side. The patient should be taught postural, pelvic stabilization, and leg exercises.⁵ By week 5 or 6, the patient is free to move the trunk, spine, and shoulder as far as can be tolerated. Low impact aerobic exercise is allowed. Vigorous running, jumping, and pulling should be avoided until week 8. At this point, normal recreation activities may be resumed and abdominal strengthening exercises can begin.

Teaching patients about pain management is very important. They must be informed that they may need pain medication, at least on an as-needed basis, for many weeks after surgery. They need to keep track of what activities cause pain.

Control of postoperative discomfort can be difficult. If the woman reclines in bed or on a lounge chair, she may not feel much discomfort, but standing or sitting in a straight chair may be insufferable.

Women need to learn to anticipate pain and premedicate themselves before activities that cause pain. Taking a pain medication before coming to the dinner table or going out to lunch or a movie may enable women to participate more fully in activities of daily living.

Incorporating activities and exercises suggested for recovery into the daily routine as well as seeing a physical therapist as soon as possible speeds healing,

strengthens weak muscles, and provides additional pain relief. Use of an abdominal binder (or later, control top pantyhose or tight jeans) may be helpful. An abdominal binder should be cut in half and placed on the lower abdomen, so that the blood supply in a pedicle flap is not interrupted.

It is imperative that the patient be counseled not to smoke or be exposed to second-hand smoke for the first few weeks after surgery. Nicotine is a potent vasoconstrictor and can interfere with blood supply to the flap. Nicotine has been associated with less production of red blood cells, greater platelet adhesiveness, and higher fibrinogen levels.⁹ The latter can lead to the formation of microemboli, which may further reduce tissue perfusion and lead to flap necrosis.

Conclusion

The provision of emotional support after breast reconstruction must be continuous. Nurses should be compassionate, understanding, and knowledgeable to help these women regain their lives. They need to understand that women have varied reactions to their reconstructed breast and mixed feelings about their sexuality and diagnosis of breast cancer. They may have fears about the need for further treatment (e.g., chemotherapy) or recurrence of their cancer. They need to know that detection is not inhibited by TRAM flap surgery.

Women need to continue with clinical follow-up and learn the benefits and limitations of monthly self-breast examinations. They do not need to have mammograms on the reconstructed breast.

References

- Ahmedin J, Murray T, Samuels A, Ghafoor A, Ward E, Thun M. Cancer Statistics, 2004. *CA A Cancer Journal for Clinicians* 2004;54(1):8-29.
- Larson DL, Yousif NJ, Sinha RK, Latoni J, Korkos TG. A comparison of pedicled and free TRAM flaps for breast reconstruction in a single institution. *Plastic and Reconstructive Surgery* 1999;104:3:674-680.
- Sandau KE. Free TRAM flap breast reconstruction. *Am J Nursing* 2002;102:4:36-44.
- Zenn MR. Breast Reconstruction: TRAM, Unpedicled. *emedicine.com*, 2003.
- Kozempel J, Dell D, Weaver C. Abdominal-wall recovery following TRAM flap surgery. *Rehabil Oncol* 2003;21:1:10-16.
- Suominen S, Asko-Seljavaara S, von Smitten K, Anovuo J, Sainio P, Alaranta H. Sequelae in the abdominal wall after pedicled or free TRAM flap surgery. *Ann Plastic Surg* 1996;36:6:629-636.
- Edsander-Nord AM, Jurell G, et al. Donor-site morbidity after pedicled or free TRAM flap surgery: a prospective and objective study. *Plastic Reconstructive Surgery* 1998;102:5:1508-1516.
- Kind G, Rademaker AW, Mustoe TA. Abdominal-wall recovery following TRAM flap: a functional outcome study. *Plastic Reconstructive Surg*

1997;99; 2:417-428.

- Fritzsche SD. Comorbid risk factors in TRAM flap failure. *Plastic Surgical Nursing* 2001;13;4:178-183.
- Sandau KE. Free TRAM flap breast reconstruction. *Am J Nursing* 2002;102:4:36-44.
- Fox Chase Cancer Center Department of Nursing Standard of Practice. Providing care to the patient undergoing microvascular free tissue transfer, Draft #1, 2003.
- Correll D, Viscusi ER, Grunwald Z, Moore JH. Epidural analgesia compared with intravenous morphine patient-controlled analgesia: postoperative outcome measures after mastectomy with immediate TRAM flap breast reconstruction. *Regional Anesthesia Pain Medicine* 2001;26;5:444-449.
- Sharma S, Chang DW, Koutz C, Evans GR, Robb GL, Langstein HN, et al. Incidence of hematomas associated with ketorolac after TRAM flap breast reconstruction. *Plastic Reconstructive Surg* 2001;107:3:352-355.
- Dell DD. Control of pain after breast reconstruction procedure. *Clin J Oncology Nursing* 2003;7;3:335-337.
- Dell DD. Regaining range of motion after breast surgery. *Nursing* 2001;31;10:50-52.



Deena Dell, RN, MSN, AOCN, BS is a clinical nurse specialist and clinical educator at the Fox Chase Cancer Center in Philadelphia, PA, where she is responsible for a transitional program for new graduate nurses, identifies and meets the educational needs of nursing staff, and acts as a resource for the management of acutely ill and breast-cancer patients. She received her Bachelor of Science in Nursing degree from the Emory University Nell Hodgson School of Nursing in Atlanta, GA, and her Master of Science in Nursing at Boston College, School of Nursing, Boston, MA

Perspectives, a quarterly newsletter focusing on postoperative recovery strategies, is distributed free-of-charge to health professionals. *Perspectives* is published by Saxe Healthcare Communications and is funded through an educational grant from Dale Medical Products Inc. The newsletter's objective is to provide nurses and other health professionals with timely and relevant information on postoperative recovery strategies, focusing on the continuum of care from operating room to recovery room, ward, or home.

The opinions expressed in *Perspectives* are those of the authors and not necessarily of the editorial staff, Cross Country University, or Dale Medical Products Inc. The publisher, Cross Country University and Dale Medical Corp. disclaim any responsibility or liability for such material.

We welcome opinions and subscription requests from our readers. When appropriate, letters to the editors will be published in future issues.

Please direct your correspondence to:

Saxe Healthcare Communications
P.O. Box 1282, Burlington, VT 05402
Fax: (802) 872-7558
sshapiro@saxecomunications.com

This continuing nursing education activity was approved by the Vermont State Nurses Association Inc. (VSNA) an accredited approver by the American Nurses Credentialing Center's Commission on Accreditation.

Provider approved by the California Board of Registered Nursing. Provider #CEP1447

After reading this article, the learner should be able to:

- Describe the difference between the pedicled TRAM flap, free TRAM flap, and DIEP flap.
- Identify five possible postoperative complications of TRAM flap surgery.
- Describe a complete postoperative assessment of the TRAM flap.
- Discuss pain management issues for the patient after TRAM flap surgery.
- Discuss activity and exercises to follow TRAM flap surgery.
- Explain the advantages and disadvantages of using open drainage for the post-liposuction patient.
- Discuss the use of compression garments for post-liposuction patients.

To receive continuing education credit, simply do the following:

- Read the educational offering (both articles).
- Complete the post-test for the educational offering. Mark an X next to the correct answer. (You may make copies of the answer form.)
- Complete the learner evaluation.
- Mail, fax, or send on-line the completed learner evaluation and post-test to the address below.
- 1.6 contact hours for nurses are awarded by the Vermont State Nurses Association which is accredited as a provider of continuing education in nursing by the American Nurses Credentialing Center's Commission on Accreditation. This program is approved by the California Board of Registered Nursing, Provider #CEP 13345, for 1.6 contact hours.
- To earn 1.6 contact hours of continuing education, you must achieve a score of 75% or more. If you do not pass the test, you may take it again one time.
- Your results will be sent within four weeks after the form is received.
- The administrative fee has been waived through an educational grant from Dale Medical Products, Inc.
- Answer forms must be postmarked by April 15, 2006, 12:00 midnight.

1. The pedicled TRAM flap uses:

- A. no muscle
- B. a small part of the rectus abdominis muscle
- C. the entire rectus abdominis muscle*
- D. the entire latissimus dorsi muscle

2. A sign that may indicate decreased arterial perfusion to a TRAM flap would be:

- A. dark red color
- B. petechiae
- C. pale or mottled skin
- D. bruising

3. _____ are contraindicated after free TRAM flap surgery.

- A. Vasopressors
- B. Inotropic agents
- C. Vasodilators
- D. Antibiotics

4. The method of choice for immediate postoperative pain relief for patients who have a TRAM flap is:

- A. PCA to administer narcotics
- B. epidural infusion of narcotics
- C. oral narcotics
- D. oral NSAIDs

5. On postoperative days 1-10, the patient with a TRAM flap may not:

- A. walk or climb stairs
- B. shower
- C. stand up straight
- D. log roll

6. The potential for respiratory complications, such as atelectasis, bronchiectasis, and pneumonia, is higher after TRAM flap surgery because of:

- A. tightening of the abdominal wall
- B. ambulation on day of surgery
- C. supine position
- D. excellent pain control

7. The patient with TRAM flap surgery is at higher risk of deep vein thrombosis because of:

- A. use of sequential compression devices
- B. ambulation on day of surgery
- C. type of anesthesia
- D. flexed position of the knees postoperatively

8. Follow-up care to detect recurrences in the reconstructed breast consists of:

- A. clinical and self-breast exams
- B. mammography
- C. ultrasound
- D. magnetic resonance imaging

9. The advantage of using TLA (tumescent local anesthesia) over a general anesthetic for a liposuction procedure include:

- A. less risk of lidocaine toxicity
- B. less volume of tumescent fluid is required to achieve anesthesia
- C. the surgeon may begin liposuction immediately after infiltration
- D. large volume of tumescent infiltration results in profound surgical hemostasis

10. Open drainage by use of adits benefits the patient's recovery by:

- A. allowing fluid to be drained around the sutures so there is less swelling post-op.
- B. limiting the number of incision sites to 2 per area of treatment
- C. allowing the site to remain open longer and allow for better drainage than linear incisions
- D. eliminating the need for a post compression garment

11. A patient has just undergone an open drainage liposuction procedure. Upon discharge she/he must:

- A. wear a compression garment for 4 -6 weeks after the surgery to limit the amount of post-op swelling
- B. have a supply of super-absorbent pads at home for frequent dressing changes
- C. must not take a shower for 1 week after the surgery
- D. arrange for an immediate post-op appointment

12. Open drainage liposuction with appropriate post operative compression reduces the risk of the following post-op complication:

- A. seroma
- B. infection
- C. scarring
- D. nausea and vomiting

13. When deciding on the compression garment, it is important to consider:

- A. the surgical area being treated since the medial thighs do not need compression.
- B. adjustable compression to maximize drainage and minimize swelling.
- C. the durability of the compression material since the garment will be worn for 4-6 weeks
- D. not to worry about the garment since the use of these are eliminated with the open drainage liposuction

Mark your answers with an X in the box next to the correct answer

What is the highest degree you have earned (circle one) ?

- 1. Diploma
- 2. Associate
- 3. Bachelor's
- 4. Master's
- 5. Doctorate

Indicate to what degree you met the objectives for this program: Using 1 = Strongly disagree to 6 = strongly agree rating scale, please circle the number that best reflects the extent of your agreement to each statement.

After reading this article, the learner should be able to:

- 1. Describe the difference between the pedicled TRAM flap, free TRAM flap, and DIEP flap.
- 2. Identify five possible postoperative complications of TRAM flap surgery.
- 3. Describe a complete postoperative assessment of the TRAM flap.
- 4. Discuss pain management issues for the patient after TRAM flap surgery.
- 5. Discuss activity and exercises to follow TRAM flap surgery.
- 6. Explain the advantages and disadvantages of using open drainage for the post-liposuction patient.
- 7. Discuss the use of compression garments for post-liposuction.

	Strongly Disagree			Strongly Agree		
1	1	2	3	4	5	6
2	1	2	3	4	5	6
3	1	2	3	4	5	6
4	1	2	3	4	5	6
5	1	2	3	4	5	6
6	1	2	3	4	5	6
7	1	2	3	4	5	6

Name & Credentials _____
 Position/Title _____
 Address _____
 City _____ State _____ Zip _____
 Phone _____ Fax: _____
 License# _____

1	A	B	C	D	9	A	B	C	D
2	A	B	C	D	10	A	B	C	D
3	A	B	C	D	11	A	B	C	D
4	A	B	C	D	12	A	B	C	D
5	A	B	C	D	13	A	B	C	D
6	A	B	C	D	14	A	B	C	D
7	A	B	C	D	15	A	B	C	D
8	A	B	C	D	16	A	B	C	D