Burns: Autografts in Burn Care, Care and Management of

Site Applicability

VGH, GFS, UBCH

Practice Level

RN (basic skill: BPTU, VGH ICU)

RN (advanced skill: all other areas)

Need to Know

The primary goal of skin grafting is to achieve wound closure. A skin graft is a piece of healthy skin tissue that is surgically removed, without an intact blood supply, from one part of the body and transferred to a surgically cleaned wound on another part of the body. Autograft is a type of skin graft taken from and placed on the same body. Autografts can be either partial thickness or full thickness in composition.

Partial thickness or split thickness skin grafts consist of thin layers (average 0.012 inch) of full epidermis and varying depths of dermis layers. They are often referred to as split thickness skin graft (STSG). Full thickness skin grafts are thicker and contain full epidermal and dermal layer and they are often referred to as FTSG. The surgically cleaned burn wound must have a viable blood supply present for the skin graft to “take”. “Take” is the process by which the skin graft heals. At first, the skin graft is loose and non-adherent with the wound base. The skin graft is kept alive through diffusion of oxygen and nutrients through plasma in the wound base. Within a few days a fine vascular support network will develop.

Skin grafts are harvested from an area of healthy skin and placed intact to the cleaned wound. These are called sheet grafts. Meshed grafts are sheet grafts that have been put through a machine called a skin mesher. This machine will place small slits in the sheet graft. These slits will allow the skin to be stretched to cover a larger area and also allows drainage from the wound bed to escape vertically through these holes. Application of skin grafts is a physician role and is usually completed in the operating room. Single small areas of grafting may be completed by the physician at the patient beside.

Most skin grafts are covered with a dressing at least initially after application. Splints and/or cast material may be incorporated into the dressing to maintain an ideal position for the body part. For the first 3 days following surgery, movement and mechanical trauma to the grafted area is discouraged. Dressings are usually removed on post op day 4-6. Handling of new grafts after dressing removal requires care to prevent dislodgment of the healed skin graft. Healed autografts provide a permanent covering for a wound.

The following are potential cover dressings for autografts:

- **Occlusive dressings** involve a layer of interface; usually paraffin gauze, silver dressing or silicone mesh over the autografts, and then a dry dressing placed over. The dressing is secured with gauze wrap and sometimes elastic bandages. Splints or half slab cast materials may be incorporated into limb dressings.
- **Tie over dressings** involve a layer of interface, usually paraffin gauze, silver dressing or silicone mesh over the autografts, and then a dry dressing placed over. The dressing is secured with sutures that cross over the dressing to hold it in place.
- **Negative Pressure Wound Therapy dressings (i.e. VAC®)** involve a layer of interface; usually paraffin gauze, silicone mesh or silver dressing, placed over meshed autografts and then a black sponge placed on top at 75 mm Hg of continuous negative pressure as ordered by the physician. The silver dressing will be changed with the autograft dressing removal, unless otherwise ordered. The silver dressing must be able to allow drainage to flow from the wound bed to the sponge. Silver mesh dressing (i.e. Acticoat™ Flex) is a good choice for this.

Occasionally autografts do not heal entirely. With appropriate wound care, small open areas may go on to heal while larger open areas may require re-grafting. Causes of autograft failure include:

- Lack of a viable, vascular wound bed
- Collection of fluid between wound bed and autograft (i.e.hematoma, seroma)
- Presence or development of infection
- Frequent and/or sustained dependency of autograft area
- Mechanical trauma to autograft area (i.e. sheer)
- Desiccation of autograft wound bed
- Dermal side of autograft placed away from wound bed

Tap water used in this procedure is municipally treated tap water. If water source is not municipally treated use sterile normal saline, sterile water or boil water source prior to using.

Equipment and Supplies

- Tap water (see note above)
- Non-sterile woven 10 cm x 10 cm gauze for cleaning
- Non-sterile bowl for cleaning
- Fine tipped forceps, pointed tipped scissors (or instrument pack)
- Non-sterile gown, sterile gloves, mask, eye protection
- Sterile gauze wrap (optional)
- Cotton tipped applicators (optional)
- Syringe with small gauge needle (optional)
- Staple remover (optional)
- Tape (optional)

- Negative Pressure Wound Therapy canister (optional)
- Sterile misting bottle (optional)
- Non-adherent interface (i.e. Paraffin gauze, silicone mesh, Exudry™ to fit autograft site)
- Drying agent (i.e. Acriflavin 1%)
- Cover dressing as appropriate for open areas (i.e. Intrasite™ gel, Acticoat, Flamazine®)

Procedure

General Autograft Care Post Op Day 1 - 4

1. Explain procedure to patient
2. As needed, administer analgesics/anxioloytics, prior to the procedure and in a timely manner according to the method of delivery. Repeat administration prn
3. The handling of covered autografts is a clean procedure
4. Bedrest for 1-5 days per individualized plan (physician order required). Assess and prevent pressure areas
5. For autografts to the posterior aspect of the patient (back, buttocks) consider use of a low-air loss support surface
6. Prevent dependency to all unsupported autograft and donor sites at all times
7. Where autografts have been covered with dressings, ensure that the dressings remain dry and intact to the autograft areas
8. Gentle handling to autograft areas to keep grafted sites immobile especially in the first 24-48 hours post grafting. When handling, be careful not to twist/turn outer dressing which could move a mobile autograft under the dressing
9. For negative pressure wound therapy use over an autograft, ensure that the setting is correct as per physician order (usually 75 mm Hg and continuous)
10. Check tie over dressings for pulling or tugging of sutures at skin. If sutures appear to be too tight or patient is uncomfortable, notify physician to assess whether the suture can be altered
11. Where elastic bandages have been used over autograft dressings (especially to the limbs) ensure that the elastic bandages are not wrapped so tightly that they impair normal positioning of the hands, fingers and toes beneath. Discuss removal and reapplication of the elastic bandage with the physician if elastic bandages appear to be too tight
12. Label dressings to autograft areas with tape noting “Caution: Autograft, keep elevated” to alert all staff
13. Protect autograft areas to the buttocks and upper thighs from soiling during bowel care using incontinent pads placed and secured over the dressing material. If autograft cover dressings become soiled, consult with physician prior to altering integrity of the cover dressing
14. Check neurovascular status to any autograft extremity as per Orthopaedic Neurovascular Assessment. Notify physician of abnormal changes
15. Radiant heaters should be at least 1 meter from the autograft site
16. Physiotherapists or Occupational Therapists will recommend positioning to maintain ROM

17. Gradual, gentle range of motion is usually started on post op day 4 or when dressings are removed from the autograft sites
18. For autografts to the lower limbs, ambulation will usually begin on post op day 4 or as directed by physician (details below)

Care of Open Autografts Post Op Day 1 - 4

1. Most autografts are covered with a dressing, at least initially. There may be some instances where autografts are treated by an open method due to their location
2. (i.e. autografts to the face) and only if the patient is able to be fully compliant with post operative autograft care. Consult physician for care directions if autografts are exposed prior to post op day 4
3. Wear non-sterile gown, sterile gloves, mask and eye protection when caring for open autografts. Change gloves as needed
4. Open autografts need to be protected from contamination and mechanical trauma and sheer at all times. Use bed cradles and position bed linen with clamps to allow air circulation but no contact with bed linen. Use care when moving patients to prevent accidental dislodgement of the autograft
5. For open autografts, assess for signs and symptoms of bleeding or infection to the autograft site. Notify physician if present
6. **Open autografts to the face** may require additional care as ordered:
    - Limit talking and facial expression
    - Soft, non-chew diet or tube feeding to diminish jaw motion from chewing
    - Careful head positioning to diminish accidental dislodgement
    - Careful securing of endotracheal tubes, oxygen tubing, nasogastric tube ties to prevent trauma to the autograft
    - Hair styled away from the autograft
7. If “rolling and aspirating” is ordered for **open sheet grafts** (no dressing to cover):
    - Care starts 4 hours post application or as ordered
    - Collections of fluid must be removed from under the sheet autograft to allow direct contact between the autograft and the wound bed
    - **In the first 48 hours only,** using a sterile cotton tipped applicator, Q2H gently roll from the middle of the sheet autograft to an edge pushing any fluid under along with the rolling. Use the cotton tip to absorb the liquid at the graft edge. Change cotton tipped applicators when saturated with drainage. Continue rolling from the middle to an edge until all areas of the sheet autograft have been “rolled”. Continue process for each piece of sheet autograft
    - After 48 hours, stop rolling as this will disturb the vascular support network. Check sheet autografts Q4H for collections of fluid under the autograft and remove fluid. To remove fluid collections after 48 hours, use a syringe with a small gauge needle and aspirate the fluid contents from beneath the autograft

- Notify physician if areas of non fluid drainage noted under the autograft (i.e. clotted blood)

8. If "misting" is ordered for **open mesh grafts:**
   - Using a patient specific misting bottle, gently mist (do not soak) the exposed mesh graft with sterile water Q1H x 48 hours
   - From 48-96 hours, mist with sterile water prn to keep open areas in mesh graft moist but not soaking wet
   - Change sterile water in misting bottles Q24 hours. Replace misting bottle once a week
   - If using radiant heat over a mesh graft, more frequent misting may be required to prevent drying of the exposed areas in the mesh

General Autograft Care Post Op Day 4 and After

1. Dressing removal post autografting requires a physician order. Dressings are usually ordered by the physician to be removed on post autograft day 4 unless otherwise ordered by physician.
2. To remove, dressings may be moistened, at any layer, using fluid (tap water, saline, or sterile water) to help soften and loosen exudate-hardened gauze
3. Carefully remove all secondary outer dressings in layers, starting with the outside layer and working to the inner layers
4. Use care in areas where the dressings may be adherent due to wound exudate
5. Carefully remove the interface layer of paraffin gauze, silver dressing or silicone mesh
6. Remove sutures or staples at autograft edges as directed by physician. If staples are plentiful and patient unable to tolerate removal of so many, some sutures or staples can be left for removal in the next 1-2 days
7. Gently cleanse all areas of the autograft using 10 cm x 10 cm non-sterile woven gauze soaked in tap water and cleansing solution. Use a new clean side of the gauze for each wipe and discard when used on both sides
8. Do not rub autografts when cleansing. Gentle wipes with the gauze, frequent changes to a clean side of the gauze and soaking will help to loosen and remove adherent drainage
9. Using clean scissors, trim any non-adherent autograft or hardened edges
10. Rinse cleansing solution from autograft sites using tap water
11. Assess percentage of autograft take and appearance of autografts
12. Physiotherapist to begin gentle range of motion exercises to all autograft areas. Autograft areas are easier to move when moistened with tap water or lubricated with lotion (use lotion only when areas healed and autograft intact). If grafts appear "fragile" be gentle with range of motion initially
13. Gently pat autograft dry using non-sterile gauze or a clean towel. Avoid rubbing. Provide a non-adherent interface (i.e. Exudry, paraffin gauze or silicone mesh on gauze) between autograft and bed linen

14. Position autograft sites to avoid dependency and mechanical trauma. If restraints are necessary to position patient, be sure that graft sites are protected from mechanical trauma
15. Small open areas (less than 2 cm) should be treated with a drying agent (i.e. Acriflavin 1%) applied daily and left to dry. Larger open areas are treated according to size, location and appearance. Some treatment options are paraffin gauze, silicone mesh, a topical antimicrobial, a silver dressing, a foam dressing or a hydrofiber dressing. Consult physician for preferred treatment option
16. Exposed tendon and bone must not be allowed to dry. Cover with a dressing to maintain moisture (i.e. 3-5 mm Intrasite gel and cover dressing; Intrasite Conformable; Acticoat Flex, water moistened gauze and cover dressing; 3-5 mm Flamazine and cover dressing)
17. Recently healed autografts should be left open to air when possible. If a dressing is required to prevent mechanical trauma or a splint required, use a non-adherent interface layer of paraffin gauze or silicone mesh and dry gauze to cover. Secure with gauze wrap. Change daily and prn. Consult with Occupational Therapist if extra padding is required
18. Apply non-scented, non-greasy skin lotion to all healed autograft sites TID and prn. Frequent applications of lotion will aid in movement. Note: once patient is wearing elastic pressure garments, consult OT for lotion suitability
19. Clean autografts daily, as above. It is very important to wash off any previous skin lotion or water based gel that is on the grafted areas or any open wounds. **Do not allow a thick crust to accumulate**
20. Manage itching using skin lotion, cool, non-restricting cotton clothing and medications as ordered
21. **Small blisters may occur on newly healed autografts due to friction or excessive pressure. Leave blisters intact to resolve on their own. If blisters open, cleanse daily using tap water and mild soap. Treat open areas as above. Consult occupational therapist if patient is wearing pressure (i.e. Pressure garments or Elasticized tubular bandage) to the grafts as pressure therapy may have to be temporarily stopped**

Ambulation of Autografts to Lower Limbs

1. Physiotherapists will begin ambulation on post autograft day 4-5, or as ordered (see ambulation protocol for autografts)
2. All autografts and donor sites require vascular support prior to each ambulation. Elastic bandages should be applied from distal to proximal in a figure-8 pattern
3. Double elastic bandages are recommended for:
    - autograft bleeds on short ambulation with single elastic bandage layer
    - diabetics or those with circulatory problems to lower extremities causing increased vascular pooling where the graft remains dark blue/purple in colour 20 minutes post ambulation
    - patient has increased pain and cannot tolerate ambulation
4. An interface of paraffin gauze or silicone mesh is required between autografts and elastic bandages prior to ambulation to prevent mechanical trauma to autografts

5. First time ambulation is of short duration, usually 5 minutes, and under the direction of the physiotherapist. (i.e. getting up to a chair)
6. After ambulation, patients are returned to bed with legs in a non-dependent position. Remove elastic bandages and assess autograft for colour, edema, bleeding and adherence
7. Increase ambulation times slowly if autografts show no changes
8. If autograft bleeds easily after elastic bandages are removed, elevate for 20 minutes and reassess
9. Patient may be up for frequent short walks with elastic bandages when 15 minute ambulation time is reached
10. If elastic bandages are to remain on the patient during the day, remove elastic bandages Q4H for 20 minutes and then reapply. Legs to be in non-dependent position while elastic bandages are off

Patient/Client/Resident Education

- Instruct patient about proper positioning following autograft application Instruct patient about proper use of splints, if necessary
- Instruct patient in pain control methods that may be used including analgesia administration, relaxation exercises and procedural sedation Explain the procedure for the removal of autograft dressings to the patient including the following:
    - day initial dressings will be removed
    - estimated time and duration of dressing change
    - any lifts/transfer devices to be used
    - procedure for removal of dressings including soaking
    - cleansing procedure
    - physiotherapy exercises
    - wound photos
    - any staff who may be present during the procedure
    - ongoing plan for future dressings, if necessary
- Instruct patient about mobilization requirements (i.e. Elastic bandaging to limbs) when ambulating post dressing change. Give pamphlet "Elastic Bandage (tensor) use for the Foot & Lower Leg" (Catalogue No. FB 880 E114) [UNDER REVISION]
- Instruct patient in application of elastic bandages to autograft sites
- Occupational Therapist to instruct patient about the use of patient specific pressure support. Give pamphlet "Scar Management after a Burn" (Catalogue No. FO.900.B933) [UNDER REVISION]
- Instruct patient in the proper care of autografts for discharge. Give pamphlet "Care of your Skin Graft after Surgery" (Catalogue No. FO.935.H69)

- Instruct patient in the management of itch. Give pamphlet "Oh, that Irresistible Urge to…scratch!" (Catalogue No. FO.950.0H1) [UNDER REVISION]
- Instruct patient to wear sunscreen and avoid direct sun exposure to autograft or donor sites
- Sensation to grafted skin will be altered, especially to heat and cold. Instruct patient to use caution when working around heat or cold
- **Patient and physician should discuss a plan for resuming normal physical activities and work schedules prior to discharge (i.e. avoidance of rough contact sports, long periods of standing on grafted legs, wearing gloves to protect grafted hands if work involves rough hand use)**
- Instruct patient on how to care for blisters that may occur on the autografts
- **At discharge, provide patient with information for follow up care (i.e. burn clinic at VGH, walk-in clinic, family physician, other plastic surgeon)**

Related Documents

- Burn Bath Procedure under revision, contact
- Burns: Facial Care for Burns [D-00-12-30295]
- Donor Site Care for Burns [D-00-12-30296]
- Burns: Acute Phase under revision, contact BPTU
- Negative Pressure Wound Therapy (NPWT) Procedure [D-00-12-30060]
- Orthopaedic Neurovascular Assessment
- Ambulation Guidelines for Autografts to Lower Limbs (contact BPTU PT)

Pamphlets

- "Care of your Skin Graft after Surgery" (Catalogue No. FO.935.H69)
- "Elastic Bandage (tensor) use for the Foot & Lower Leg" (Catalogue No. FB 880 E114) [UNDER REVISION]
- "Scar Management after a Burn" (Catalogue No. FO.900.B933) [UNDER REVISION]
- "Oh, that Irresistible Urge to…scratch!" (Catalogue No. FO.950.0H1) [UNDER REVISION]
- "Do's & Don'ts of Donor Site Care" (Catalogue No. FO.160.C18) [UNDER REVISION]

V.A.C. is a ® of KCI-Medical Flamazine is a ® of Smith & Nephew

Acticoat, Exudry, Intrasite are ™ of Smith & Nephew

Acriflavin is compounded in VGH Pharmacy

References

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Herndon, DN. Total Burn Care, 3rd Edition. Saunders Elsevier, 2007.

Korber et al, Vacuum assisted closure device improves the take of mesh grafts in chronic leg ulcer patients. Dermatology 2008; 216(3): 250-256.

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Alternate Search Terms

graft skin graft permanent wound covering

autograft STSG FTSG occlusive dressings

tie overs sheet grafts mesh grafts