

Full Thickness Skin Graft

Richard Davis

Introduction:

The full thickness skin graft has definite advantages and disadvantages over split thickness skin, which make its use much more appropriate in certain areas. These include the face and scalp and across joints.

The main limitation of full thickness skin grafts is the size: skin must be taken from places where it is “redundant.” When you remove full thickness skin you must leave enough behind to still close the wound. Areas where this can be done include the lower neck, the groin, the posterior axillary fold, and the abdomen. For small grafts on the head or face, the skin behind the ear is color-matched and hairless.

Full thickness skin grafts contract much less than split thickness grafts do, so they are commonly used in sensitive areas of the face. For example, in a large facial burn it would be appropriate to use split thickness skin (not meshed) on most of the face, but the eyelids would be better treated with a full thickness graft.

Full thickness grafts can be used for burn contracture reconstruction, though they are more likely than flaps to cause recurrent contracture with this application. Many practitioners will splint a joint for a period of 3-6 months after contracture release and full thickness graft reconstruction.

In head and neck reconstruction, skin for grafting is often chosen from the neck because this area has had the same sun exposure as the head, so the color match of the graft will be better. This is less of an issue in people with very dark skin, however.

One other consideration is whether the donor site bears hair, and whether hair is appropriate at the recipient site. Most people would not want hair growing on their forehead, or on the inside of their mouth. And if hair-bearing skin is used as a for urethral reconstruction, either as a flap or a graft, the hair follicles can act as a nidus for stone formation.

Closure of defects after head and neck tumor excision is a complex subject. In some cases, a flap will be better suited than a graft, especially in a hair-bearing part of the scalp. However, if you do not have a plastic surgeon available, full thickness skin grafts are easy to do, reliable, and provide an excellent functional and cosmetic outcome.

Harvesting and placement of full thickness skin grafts proceeds in the following steps:

- Measure the size of the defect and prepare it
- Choose the donor site and make sure it can be closed after removal of a defect-sized piece
- Harvest the donor skin, partially de-fatting it in the process
- Complete the de-fatting of the donor skin
- Suture the donor skin into place
- Undermine skin around the donor site and close.
- Cut “pie crust” holes in the graft and apply a dressing.

Steps:

1. Prepare the defect so there is no necrotic tissue and no ongoing bleeding. Gently tap any bleeding areas with the diathermy but avoid overuse and leaving any charred areas. Measure the defect size. It is acceptable to lay two pieces of full thickness skin next to each other if the defect is large.



This defect after anterior neck contracture release was too large for one piece of full thickness skin. Two pieces, one from each groin fold, were obtained. This provided enough skin to close the defect.

2. Draw an ellipse in the planned donor site, in a corresponding size to the defect, in such a way that the wound can be closed. In the groin, this will be along with the groin crease. In the neck or abdomen, it will be horizontal. In the posterior axillary fold, it will be vertical.
3. Inject local anesthesia with epinephrine at the donor site. If possible, allow time to pass between injection and harvest to minimize bleeding.

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4. Make the elliptical incision down to the subcutaneous tissue. Do not use diathermy to make this incision or to harvest the graft.



Incision through the skin and dermis. Continue down to the subcutaneous fat circumferentially.

5. Raise up the skin at one corner of the ellipse and use fine curved scissors to cut the subcutaneous fat off the skin. It is acceptable to leave a small amount of fat on the skin, but most of it should stay behind in the wound. In this way, you begin the process of “de-fatting” the graft while harvesting it.



Elevate one corner of the ellipse and trim the fat off the skin as you elevate it. It is acceptable to use diathermy on the wound that remains behind, but avoid using it on or near the skin to be grafted.

6. Finish de-fatting the graft. Holding the skin so that the dermis (deep side) curves gently outwards, cut any remaining fat off the graft. When you are finished, the entire dermis side of the graft should be white and glistening, like the ventral side of a fish.



Grasp the skin with your non-dominant hand and gently evert it “inside-out.” Trim any remaining fat off the graft so that only the underside of the dermis remains.



The final appearance of the full thickness skin to be grafted. It is pale white and glistens like the belly of a fish.

7. Trim the graft so that it is the shape and size of the defect.
8. Suture the graft into place with interrupted absorbable sutures.



Suture the graft into place with interrupted absorbable sutures. Sewing on the face or other exposed area, use fine sutures close together to maximize cosmetic appearance.

9. Undermine the skin at the donor site with dissecting scissors or diathermy,

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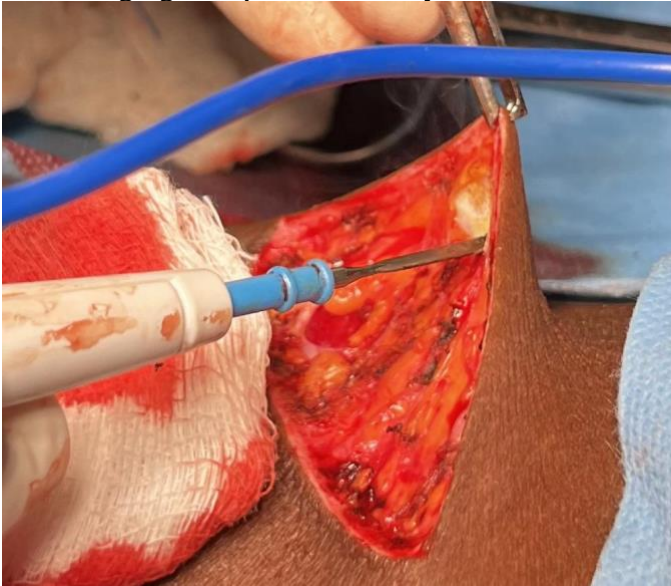
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circumferentially for about 1-3cm. The wound should close without excessive tension. Stay in the plane between the skin and the subcutaneous fat but do not “defat” the skin here as you did when harvesting the graft. In the posterior triangle of the neck, don’t use diathermy, to avoid damaging the spinal accessory nerve.



Using scissors or diathermy, undermine the skin around the donor site by dividing the subcutaneous fat. Do not follow the same plane that you used to dissect the graft, to avoid compromising the blood supply to the surrounding skin.

10. Close the donor site. In a visible area such as the neck, use absorbable deep sutures followed by small, close together interrupted or running sutures that you remove after 5-7 days. In a less visible area, use vertical mattress nonabsorbable monofilament suture.
11. Make “pie crust” incisions in the graft to allow any blood underneath it to escape rather than accumulate. The graft must be firmly adherent to the wound base, especially during the first 3-5 days.



“Pie crust” incisions in the graft prevent blood from accumulating underneath and endangering the graft. These will not be visible when the wound heals.

12. Suture 6-8 loosely tied monofilament sutures to the skin around the graft and leave each one 10-15cm long.
13. Apply antibiotic ointment or silver sulfadiazine over the graft and then cover it with a wet gauze. Fold a dry gauze over the top.
14. Tie the monofilament sutures over the gauze, making a “tie over bolster” dressing. This dressing is safer than simply wrapping a bandage around the head, as it does not allow the graft to move.



15. Remove the dressing in five days. It is normal for the graft to look dusky and congested or even ecchymotic at this point. Put your finger on it and gently wiggle it: as long as it is stuck to the base of the wound, it will survive. Instruct the patient to keep it moist with antibiotic ointment or

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petroleum jelly for the next 3 months and follow them frequently to watch the progress of the wound.



Appearance of a graft at five days after placement of a full-thickness skin graft in the temporal area just above the left eye. The skin has normal color. When pressed gently with a fingertip, it is adherent to the tissue underneath.



Appearance of the above wound after two months. The outcome is excellent and the patient is satisfied. Note that the "pie crust" incisions are no longer visible.



Appearance of a graft at five days after placement. Even though the color is concerning in this pale-skinned man, all of the skin is adherent to the wound base.

Pitfalls

- Graft failure: The main indicator is not the appearance of the graft, but whether or not it sticks to the wound bed. If part of it sticks and another part does not, you may try to reapply a pressure dressing for 3-5 more days, though it is unlikely to take at this point. Sharply debride the skin that does not stick to avoid endangering any part of the graft that has taken. If a graft looks poor, do not automatically debride and remove it; if it is adherent to the wound base it will likely heal well.
- Difficulty in closing or dehiscence of the donor site: this complication is best avoided rather than treated. If you do not take more skin than you can "pinch" between a thumb and forefinger, the defect will close. If you find you can not close the donor site, undermine the skin further. Do not thin the skin too much in this process or you will devascularize it.
- Contraction: even full thickness skin grafts will contract to a small degree. We prefer to use flaps for contractures across any joint for this reason. If a flap is not feasible due to the contracture's

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location or surgeon inexperience, it is acceptable to use a graft. Make sure the patient is cooperative and willing to keep the joint straight during the healing period.

- Using donor sites with hair may bring hair to a place where the patient does not want it, such as in the middle of the forehead, inside the mouth, or on the neck in a woman. Donor sites without hair (usually) include the posterior axillary fold, the lower neck, and the space behind the ear. If there is no other option than to use hair-bearing skin, inform the patient in advance. The hair on groin skin is generally thin enough that the patient can pluck or trim it periodically. Avoid using hair-bearing skin to replace any part of the urinary tract, as stones will form on the hair when it comes in contact with urine.

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