International Journal of Medical Science and Clinical Research Studies

ISSN(print): 2767-8326, ISSN(online): 2767-8342

Volume 02 Issue 11 November 2022

Page No: 1195-1198

DOI: https://doi.org/10.47191/ijmscrs/v2-i11-01, Impact Factor: 5.365

Quick Overview of Skin Autografting

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ABSTRACT

A skin autograft is described as the transfer of skin without the aid of a blood supply from the donor location to the recipient site. The epidermis and portions of the underlying dermis from the donor location are transferred using split-thickness skin grafts (STSGs). The whole layer of skin is harvested for full-thickness skin grafts (FTSGs) and used as the transplant. The installation methods and usage of STSGs are discussed above. Graft movement, which impedes neovascularization and promotes fluid accumulation under the transplant, which can result in infection and inadequate revascularization, is the key factor in skin graft failure.

ARTICLE DETAILS

Published On:
02 November 2022

Available on:
https://ijmscr.org/

INTRODUCTION

If primary closure cannot be achieved, skin grafts are advised for the covering of a skin defect caused by burns, trauma, infection, or after the removal of a tumor. If the wound's bed is properly prepared and vascularized, skin grafts can also be utilized to cover and accelerate the healing of chronic wounds. In addition to tissue flap reconstructive procedures, skin grafts may be employed.[1]

AUTOGRAFTS

An autograft is the transfer of skin from one area of the body to another inside the same person. For a variety of purposes, these are the most often utilized grafts for skin repair. Both split thickness and full thickness autografts can be harvested. [2]

Split-thickness skin grafts (STSGs), also known as partial-thickness grafts, transplant a section of the skin from the donor location, including parts of the underlying dermis and the epidermis. If the necessary dermal structures are still there, this enables the donor site to recover from the epidermal components left behind. [3]

The whole layer of skin is harvested for full-thickness skin grafts (FTSGs) and used as the transplant. As a result, there are no dermal or epidermal components left at the donor site, which must be closed using an STSG, a secondary local flap, or local advancement of the surrounding skin. [4]

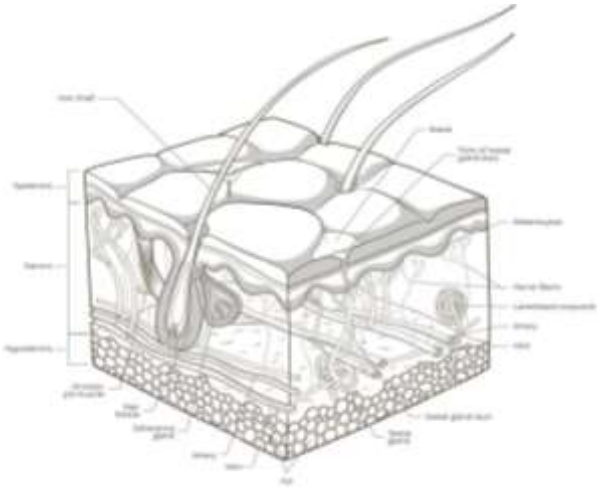

Figure 1. Skin layers

Quick Overview of Skin Autografting

SPLIT-THICKNESS SKIN GRAFTING

For tissue covering, the split-thickness skin graft (STSG) is the most popular donor. The epidermis plus various quantities of dermis, ranging from 8/1000 of an inch (0.196 millimeters) to 12/1000 of an inch, make up an STSG (0.294 millimeters). [5]

Split-thickness skin grafting's key benefits are the capacity to cover vast surface areas with less donor skin and the availability of reharvesting donor sites after full healing (generally in 10 to 15 days). Larger flaws can be addressed by reharvesting, expanding the graft using meshing methods, and combining allograft procedures (sandwich technique: 1:2 autograft covered by 1:4 allograft). In older persons whose dermis is thinner, a certain amount of caution should be exercised; unwise thick harvesting may result in sores that are challenging to cure. [6]

Fragility, irregular pigmentation, loss of smooth texture, and absence of hair are some of the drawbacks of STSGs. The probability of contracture is increased by the absence of a dermal element and the resulting restricted pliability and elasticity. Large burns to the face may need the use of STSGs, which might result in an unattractive mask-like look. A big source of extra discomfort is the donor site. [3]

The use of a portable dermatome has replaced the free-hand use of a knife in STSG harvesting techniques. It is possible to utilize a dermatome that is powered by compressed air or electricity. The dermatome features a big blade that resembles a scalpel and an adjustable depth gauge. [7]

When more coverage is required, the collected STSG can be extended by a meshing device (1:1.5 to 1:9) to enhance its surface area. Depending on the availability of donor sites, the most popular meshing ratios for skin grafts are 1:1 mesh (micro mesh), 2:1 mesh, and 4:1 mesh (with an overlaying 2:1 meshed allograft). Patients with fewer donor sites, such as those with severe burns, are the only ones who should use larger mesh ratios. The wound bed must be clear of an infection, exudate, and hematoma before the skin transplant may be applied. [8]

The quickest way to fasten the graft to the wound is using staples. The procedure is simple, and the supplies are reasonably priced. It is also possible to employ numerous tacking sutures if the wound has an odd surface shape. Large-scale staple placement typically need removal in the operating room and may call for general anesthesia. Additionally, there is a chance that staples will remain in the incision after removal, which might lead to painful, infected, and slow-healing wounds. To stabilize the skin graft once the STSG has been put in place, the right amount of covering is required. [9]

The donor site dressing ought to encourage reepithelialization with the least degree of discomfort and anguish. Careful handling is necessary to maintain tissue availability and integrity, reduce the risk of infection, and harvest regenerated skin from the donor site if necessary. Every 72 hours until it has healed, the donor site is examined. [10]

No one dressing has been established as being better than another as the ideal dressing for donor locations. Usually, the kind used is determined by the surgeon's preferences and availability. Following split-thickness harvesting, hydrocolloid dressings may be linked to the donor site wound's quickest healing rates. [11]

FULL-THICKNESS SKIN GRAFTING

Full-thickness skin grafts (FTSGs) take the entire layer of skin, including the dermal and epidermal components, and use it as the graft. An FTSG requires more time to revascularize the donor skin than a split-thickness skin transplant due to the thicker tissue (STSG). [4]

In comparison to STSGs, FTSGs offer better texture, pliability, elasticity, aesthetics, and color match and are more resistant to secondary contracture. When applied to wounds on the hands and face, FTSGs offer a cosmetic advantage. Both the donor location and the receiver site had higher patient satisfaction levels. [12]

The major limitations and disadvantages of using FTSGs include the following [13]:

Due to donor sites' inability to regenerate on their own, there is a limited supply of high-quality donor skin. The flexibility of the adjacent skin prevents repeated harvesting in the same location.

Because a FTSG should ideally match the recipient site for color, skin thickness, and texture, not all parts of the body are eligible as donor locations. The possibility for color mismatch while using a FTSG on the face is a disadvantage, with outcomes ranging from hypopigmentation to hyperpigmentation.

The absence of interstices in FTSGs raises the possibility of seroma and hematoma development and may lower graft take.[14]

Without utilizing a dermatome, a FTSG is manually harvested with a knife. [15]

Since a FTSG doesn't shrink much throughout the healing process, the donor skin should be cut to the precise dimensions of the defect. A flexible material that can adapt to the fault, such as sterile paper or gauze, should be used to create a template of the flaw. This makes it possible to fit the harvested skin "tailor-made," without removing more skin than is necessary. [16]

Especially on the face, donor site incisions should be designed along natural skin creases (relaxed skin tension lines or Langer's lines). When these lines are crossed, the incision closes, resulting in more obvious scars. Extra skin closure stress might result in unattractive hypertrophic scarring. [17]

The recipient site is prepped, and the FTSG is inserted before being sutured into position with small, quickly absorbing sutures. The graft can be secured to the recipient

site with quilting sutures. To enable evacuation of blood exudate without jeopardizing the integrity of the graft, tiny incisions are created to puncture the complete thickness. [18]

COMPLICATIONS

Graft failure can be caused by the recipient site's inadequate vascularity, hematoma, seroma, infection, too much stress, or mechanical shearing forces. Most of these problems may be prevented by thorough wound bed preparation, precise hemostasis, cautious graft insertion, adequate dressing, and immobilization during the healing process. [19]

Methicillin-resistant coagulase-positive staphylococci (MRSA), beta-hemolytic streptococci, or pseudomonas are the most frequent causes of infection. To guide the administration of antibiotics, cultures should be collected. With wet to moist saline-soaked gauze or other local dressings, partial graft loss can be managed and will typically recover subsequently. Reassessing the bed is necessary in the event of total graft loss. Regrafting can begin if the wound bed has developed a healthy blood supply. [20]

CONCLUSION

The state and needs of the recipient bed determine whether to utilize a skin graft or a tissue flap. The recipient site's vascularity affects the success of a skin graft. A devascularized bed (such as bone or cartilage) requires flap covering whereas a well-vascularized bed can take a transplant. The decision is frequently influenced by factors including size, location, and aesthetics. A skin transplant initially seems erythematous and uneven, but as it develops over the course of three to six months, the graft will smooth out but will still maintain the tone and consistency of the donor site, which is a significant drawback. Since a local flap enables "like with like" replacement, it will produce a more aesthetically pleasing outcome than a graft. In addition, a flap will be necessary to reconstruct structures or fill major flaws. Split thickness: Good for covering wide regions; delicate; prone to contracture; donor sites may be harvested again. Full thickness: Smooth and pliable texture, thicker covering, decreased take, and poor drainage of fluid buildup. Limited options for harvesting because donor sites are largely in need.

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