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Banking and use of glycerol preserved full-thickness skin allograft harvested from body contouring procedures

Serag M. Zidan^{*}, Samy A. Eleowa

Department of Plastic Surgery and Burn, Faculty of Medicine, Al-Azhar University, Almokhayam Aldaem Street, Nasr City, Cairo, Egypt

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ABSTRACT

Introduction: The use of glycerol preserved skin allograft (GPA) became a main stay in burn treatment. However, harvesting of cadaveric skin is not yet legalized in many countries including Egypt.

Objectives: To estimate the feasibility of using skin harvested from body contouring procedures as a source of GPA and its clinical efficacy.

Patients and methods: Skin harvested from body contouring procedures done in Al-Azhar university hospitals was preserved by glycerolization and used in management of burn and complicated wounds.

Results: In the period between February 2012 and February 2013 skin was harvested from 24 abdomenoplasty cases, 6 bilateral breast reduction cases, and 1 case of thigh lift done in Al-Azhar university hospitals. This yielded about 22,000 cm² of skin preserved by glycerolization. This GPA was used in 15 excised burn wounds, in 9 cases of chronic burn wounds, and in 6 complicated wounds. Partial graft loss occurred in 3 cases and total graft loss occurred in 1 case.

Conclusion: The glycerolized full-thickness skin harvested from body contouring procedures is clinically effective in burn and wound management. In the presence of regional coordination, it can serve as an abundant source for skin banking in where cadaveric skin use is not legalized.

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1. Introduction

The over-riding objective of acute burn care is closure of the burn wound with the patient's own epidermis. Sometimes that happens spontaneously, and sometimes it requires an operation to excise the burned tissue and ultimately cover the wound with an autologous skin graft [1].

In both situations, the use of skin allografts to achieve temporary wound closure has become a mainstay in burn management.

Treatment of partial thickness burns with human skin allograft has a number of advantages over the treatment with topical antimicrobial therapy [2] as well as treatment with hydrocolloid-derived dressing [3].

Immediate pain reduction after application of the allograft skin dressing, prevention of desiccation of the wound bed with prevention of deepening of the wound, less need of early wound excision and lower occurrence of hypertrophic scarring were described [4].

Although autograft is the optimal therapy for deep burns that require excision, there exists a population in whom

^{*} Corresponding author. Tel.: +20 1020107311.

autografting is impossible, often related to a large wound burden. These patients frequently benefit from the use of skin allotransplantation [5].

In addition to burn management, skin allograft can also be used as a biological dressing for complicated wounds which for some reason cannot be closed immediately. This appears to be a better preparation of the wound bed prior to autograft transplantation [6].

Although skin allotransplantation is a long-standing practice, the modern preparations of cadaveric skin allograft have only recently been established. Cryopreserved allograft (CPA) skin, first introduced in 1979, carries the putative benefit of viability. Glycerol-preserved allograft (GPA), in use since the mid-1980s, is nonviable [7] but is inherently antimicrobial [8] and is presumed to be less immunogenic [9].

Rejection process was studied by Cinamon, who compared fresh, cryopreserved and glycerol preserved allograft skin. No clinical differences were seen on days 4 and 7, although the histological examination favored fresh and cryopreserved skin [10].

Furthermore, a thorough review of the current literature by Hermans found that there were essentially no randomized controlled head-to-head trials prospectively comparing cryopreserved allograft with GPA [11].

Since glycerol preservation is simpler, more cost-effective and possesses antibacterial and antiviral properties as well as suppressed immunogenicity in allograft, GPA is popular and commonly used in clinical practice. Euro skin bank postally surveyed 37 European burn centers and found that 90% of responding burn centers used GPA regularly [12].

The cadaveric skin is almost the only source of banked skin allograft. However, the use of cadaveric skin is not yet legalized in many countries including Egypt and is still a

source of social and religious debate. In the department of plastic surgery and burn; Al-Azhar University we started to harvest and glycerolize the skin removed in various body contouring procedure. The results of our preliminary work have encouraged us to continue this study. Our aim is to estimate the amount of skin gained by this method in a year and its clinical efficacy. Moreover, this would help us to determine the significance of founding a skin bank based on the skin harvested from body contouring procedure.

2. Patients and methods

This study was accomplished at Al-Azhar University Hospitals, Cairo, Egypt in the period from February 2012 to February 2013. Skin was harvested from body contouring procedure, and preserved by glycerolization. It is used as a skin substitute for temporary wound closure in burn unit as well as a biological dressing to optimize complicated wounds for coverage with autograft.

2.1. Allograft preparation

We selected three body contouring procedures as sources for the GPA. These are abdomenoplasty, large breast reductions and vertical thigh lift.

Preoperatively, the donor is screened for human immunodeficiency virus and hepatitis A and B viruses. The skin in the excision part should be free from any manifestation of infection or dermatological diseases.

Harvesting of the skin (Fig. 1) is done in the operative room directly after its removal from the donor. The skin is harvested by scalpel as a full thickness skin graft under the same sterile conditions of the original operation. All patients provided

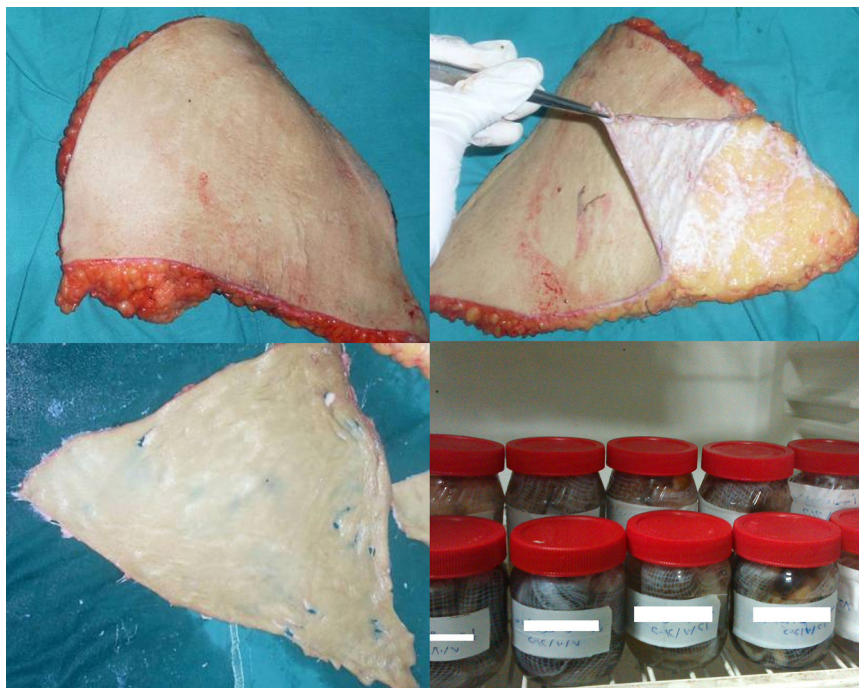


Fig. 1 - The steps of harvesting and storage of full thickness glycerol preserved skin.

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