Dermatology Practical & Conceptual

Successful Treatment of Pyoderma Gangrenosum with Composite Grafting of Acellular Dermal Matrix and Glycerolized Skin: A Preliminary Experience

Linda Tognetti,[1] Laura Calabrese,[1] Elisa Pianigiani,[2] Francesca Ierardi,[2] Pietro Rubegni[1]

1 Dermatology Unit, Department of Medical, Surgical and Neurological Science, Dermatology Section, University of Siena, Siena, Italy
2 Skin Bank Unit, S. Maria alle Scotte Hospital, Siena, Italy

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Corresponding Author: Linda Tognetti, MD,PhD, Department of Medical, Surgical and Neurological Science - Dermatology Section, University of Siena, S. Maria alle Scotte Hospital, Viale Bracci 16, 53100 Siena, Italy. Tel: 0039-0577 585893. Fax: 0039 0577 585426 E-mail: linda.tognetti@dbm.unisi.it

Introduction

Pyoderma gangrenosum (PG) is a rare neutrophilic autoinflammatory skin disorder presenting as a painful and rapidly growing ulcer, with typical erythematous undermined edge, which can develop at injury sites due to pathergy phenomenon. PG is usually associated with immuno-mediate disorders such as inflammatory bowel diseases, rheumatoid arthritis and with neurological diseases. Given its unpredictable behavior, treatment must be tailored to the patient status and comorbidities. Briefly, the use of immunosuppressive drugs (steroids and cyclosporin) or immunomodulating (ie anti-TNFα inhibitors) proved to be effective in controlling inflammation. On the other hand, there is no consensus on which is the best topical treatment to stop the inflammatory loop and stimulate the ulcer healing [1]. Among them, a treatment protocol based on the grafting of autologous skin after adequate debridement through negative pressure wound therapy or hyperbaric oxygen therapy gave promising results in immunosuppressed patients [2,3]; we previously reported on positive outcome with glycerolized skin on a PG lesion [4]. Recently, grafting of an acellular dermal matrix for a deep PG wound was described [5].

We here report our preliminary experience of two cases successfully treated with a composite grafting technique based on acellular dermal matrix and glycerolized skin prepared in the Skin Bank Unit of Siena Hospital [5,6].

Cases Presentation

Case #1. A 52-year-old man with positive anamnesis for alopecia universalis and an undetermined demyelinating disease causing a right limb hemiplegia underwent orthopedic surgery for a hip titanium prosthesis implant, an ulcerative wound appeared after one week. Clinical appearance at presentation time 6 weeks after surgery showed a fibrinous

lesion with undermined erythematous borders of 11x16 cm (Figure 1A). After the diagnostic confirmation by histopathology, treatment with Prednisone 32 mg/die and was Cyclosporine 250 mg/die started, then tapered until suspension after 3 months and 6 months respectively. Atraumatic debridement was realized with topical collagenase and hydrocolloids, then composite grafts was prepared: patches of acellular gamma-irradiated de-epidermized dermis (DED) were grafted into the deeper parts of the wound bed (Figure 1B), glycerol-preserved skin meshed 1:3 allografts (Figure 1C) were positioned to cover the whole surface; the grafts were stabilized with steri-strip (stiches were not performed to avoid pathergy phenomenon), double paraffin gauze layers were positioned (Figure 1D) and compressive dressing was performed. Epidermal allograft was replaced every 3 weeks for 2 times until intake (Figure 1E), then the graft was resized and double paraffin gauzes replaced every week. At month 3.5, dressing with rigenase-polyhexanide was applied every 3 days (Figure 1, F and G) until final closure (Figure 1H) after 5 months. The patient had no recurrences at 8 months follow-up (Figure 1I).

Case #2. A 90-year-old woman affected by diverticulitis developed a PG after trauma of the left thigh: she was under Prednisone 5mg/die, Methotrexate 15 mg weekly with folic acid for Horton arteritis. After the diagnostic confirmation, prednisone was incremented to 25 mg/die. Once the wound bed was chemically debrided Figure 2A), composite allografts was realized as previously described (Figure 2B); after 1 month, the wound bed appeared reduced and filled with adequate granulation tissue (Figure 2C). The patient died after 2 months for complications due to bowel perforation.

Conclusions

Skin allografts are well known to accelerate healing in hard-to-heal wounds [4,6]. Composite grafts are tailored according to wound specific features: the acellular DED, due to its poor immunogenicity, acts as an ideal scaffold guiding the host cells proliferation and preventing scarring while the overlying epidermal grafts ensure the optimal wound humidity and consent the re-epithelization. In particular, glycerolized skin allografts bring further advantages: being hypocellular, can be partially integrated into the PG wound bed, guiding re-epithelization; glycerol can significantly reduce local pain, as reported by both patients.

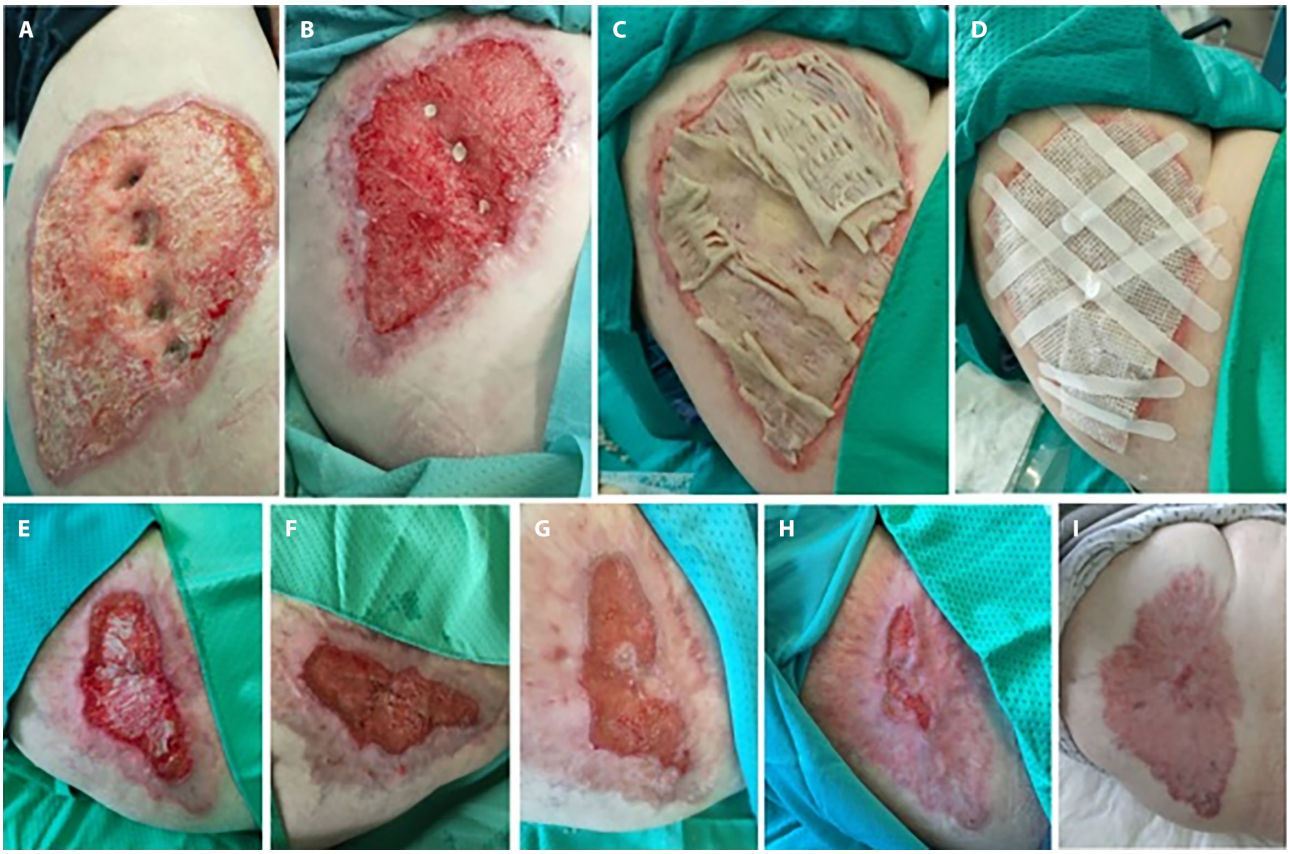

Figure 1. (A) Clinical appearance at presentation time of patient 1: large ulcerative lesion with fibrinous bed and undermined erythematous borders of 11x16cm; (B,C) Application of the acellular gamma-irradiated de-epidermized dermis patches into the deeper parts of the wound bed (B) and of the glycerolpreserved epidermis meshed 1:3 allografts (C); (D) Fixation with steri-strip and double paraffin gauze layers. (E-L) Wound appearance 2 (E), 3 (F) and 4 (G) months after composite grafting. Final closure at month 5 (H) and follow-up at month 8 (I).

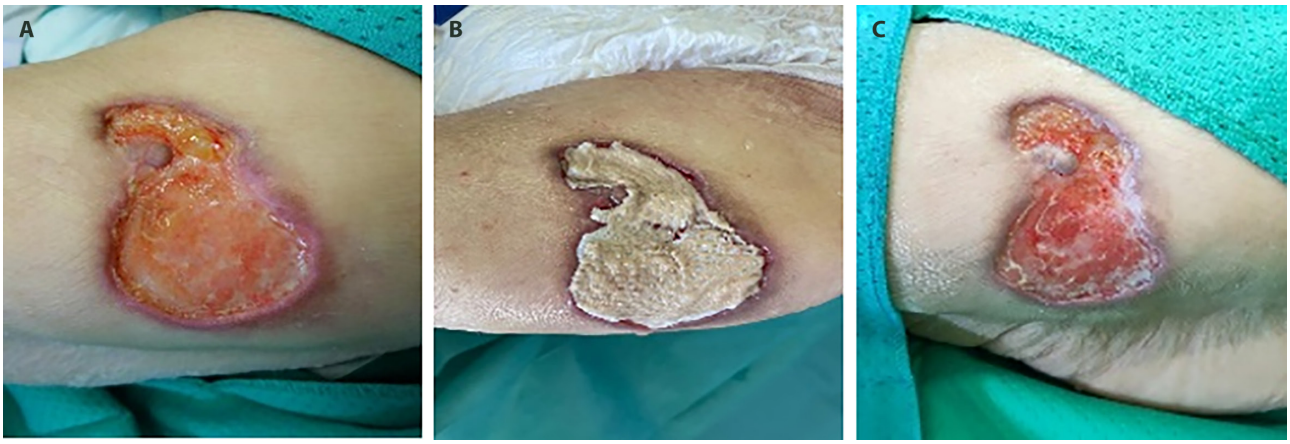

Figure 2. (A) Wound appearance after chemical debridement; (B) Glycero-preserved epidermis meshed 1:3 allografts positioned to cover the whole surface; (C) Lesion after 1 month: the wound bed appeared reduced and filled with adequate granulation tissue.

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