Injury, Int. J. Care Injured (2007) **38S**, S38—S44

ELSEVIER

INJURY
INTERNATIONAL JOURNAL OF THE CARE OF THE INJURED

www.elsevier.com/locate/injury

Treatment of deep partial thickness and indeterminate depth facial burn wounds with water—jet debridement and a biosynthetic dressing

M. Tenenhaus [a], D. Bhavsar [a], H.-O. Rennekampff [b,*]

[a] *Division of Plastic Surgery, University of California, San Diego, School of Medicine, San Diego, CA, USA*
[b] *Clinic of Plastic, Hand, Reconstructive and Burn Surgery, BG Trauma Center, University of Tübingen, Tübingen, Germany*

KEYWORDS
Burns;
Face;
Debridement;
Waterjet;
Skin substitutes;
Dressings

Summary

Background: Debriding deep thermal injury to face and neck can be particularly challenging with cold knife techniques. Timely healing, a precondition for minimal scarring, is dependant upon optimal wound bed preparation.
Objective: A new water-jet surgical tool (Versajet)™ (Smith & Nephew, Hull, UK) has been designed for wound debridement. Ex vivo histologic analysis of depth of debridement on human skin confirmed that predictable and controlled depth of debridement could be obtained by adjusting apparatus settings.
Methods & Materials: We prospectively studied the versatility of this instrument for the treatment of deep and indeterminate depth face and neck burns. Wounds were then covered with either a biosynthetic (Biobrane)™ (Bertek Pharmaceuticals Inc) or cultured biosynthetic dressing (TransCyte).
Results: Patient follow-up demonstrated no adverse effects. Placement of biosynthetic dressings was compatible with water-jet debridement. Median healing time for wounds covered with biosynthetic dressings was 14 days, and 12 days for those which received the cultured biosynthetic dressing.
Conclusion: We have found the water-jet system to be a versatile instrument for surgical burn debridement with particular advantage in addressing the challenging and delicate contoured regions found in the face and neck. Accurate control of debridement depth facilitates wound bed preparation for simultaneous treatment with growth promoting biosynthetic dressings.
© 2007 Published by Elsevier Ltd.

Introduction

The acutely burned face, particularly with deep or indeterminate burns, poses particular challenges for the surgeon and staff: a delayed excisional

* Corresponding author.
E-mail address: rennekampff.oliver@mh-hannover.de (H.-O. Rennekampff).

0020-1383/$ — see front matter © 2007 Published by Elsevier Ltd.
doi:10.1016/j.injury.2007.10.039

Table 1 Demographics of patients with burn injuries to the face and neck

Case no.	Age/sex	Area treated (% TBSA)	Depth of burn	Time to heal (days)	Additional treatment
1	45/m	Face, neck, 5%	IIb°	9	TransCyte
2	32/m	Face, neck, 4%	IIb°—III°	12	TransCyte, allograft then autograft to III° neck
3	76/m	Face, neck, 5%	IIb°	12	TransCyte
4	49/m	Face, neck, 4%	IIb°	8	TransCyte
5	80/f	Face, 4%	IIa°—IIb°	14	Biobrane
6	54/m	Face, 3%	IIa°—IIb°	13	Transcyte
7	19/m	Face, 4%	IIa—IIb°	12	Biobrane
8	30/m	Face, neck, 5%	IIb° III°	12	TransCyte, allograft then autograft to III° neck
9	38/m	Face, 4%	IIa—IIb°	19	Biobrane
10	20/w	Face, neck, 3%	IIb°	17	TransCyte
11	20/m	Face, 4%	IIa°	14	Biobrane
12	37/m	Face, 4%	IIa—IIb°	18	Biobrane
13	34/m	Face 4%	IIa—IIb°	14	Biobrane

approach provides additional time for accurate wound depth determination and preservation strategies while early excisional strategies will decrease edema, inflammation, and scarring [2,10].

Debridement of superficial and intermediate depth partial thickness wounds with classical sharp instruments like the Goulian or Humby knife, or deep-faceted curettes, may easily result in the loss of skin appendages critical for timely re-epithelialisation. Sensitive tissue preservation as well as timely closure help to minimise scarring and deformity.

For control of bacteria, biologic dressings provide an alternative to topical antimicrobial agents. These optimise the physiologic wound environment, protect the wound from desiccation and promote the healing process by encouraging the release of cytokines and growth factors.[5,13] Allogenic skin [7] as well as commercially available biosynthetic dressings like Biobrane™ [3,6] and TransCyte™ [4,11] are excellent adjuncts for wound bed protection, preservation and the promotion of epithelialisation in the treatment of partial thickness injuries. Biobrane is a biosynthetic wound dressing principally composed of a porcine collagen-coated nylon mesh. TransCyte is a refined temporary skin substitute containing collagen, various cytokines and growth factors produced by human dermal fibroblast culture on a porcine collagen-coated nylon mesh. These products bio-integrate most favourably when applied early before the development of a pseudo-eschar.

Recently, a water—jet debriding tool has been developed for surgical wound debridement and wound bed preparation and has shown particular promise in the field of cutaneous debridement [8,14]. The benefits include controlled and rapid debride-

Table 2 Results of ex vivo study on depth of debridement with the Versajet system

Setting	Observation
1	No macroscopically visible debridement of the skin. Histologically, no significant effect on the epidermis compared to a control non-debrided skin specimen (Fig. 3a). Basal and supra-basal layers of the epidermis were intact
2	No macroscopically visible debridement of the skin. Histology revealed a partial debridement of the supra-basal epidermis, mainly the stratum corneum
3	Superficial macroscopically visible debridement path. Histologically, in several cross sections, debridement of the supra-basal epidermis leaving an intact basal layer (Fig. 3b) similar to that seen with power setting 2.
4	Several areas demonstrated a debridement pattern down to the basement membrane. A clear path of debridement. Histology revealed complete removal of the epidermis. The dermis was debrided to a depth of approximately 40 microns at this setting.
5 and 6	A similar histologic picture to setting 4. The epidermis was completely removed and some degree of dermis was debrided (Fig. 3c). Skin appendages, especially the bulb region of the hair shaft, remain intact
7 and 8	Partial debridement of the dermis to a thickness of 80 to 100 microns (Fig. 3d)
9 and 10	Debrided 1/10 (approx 200 microns) of the depth of dermis. In several areas, deeper cuts into the tissue could be seen. The surface of the debrided dermis was somewhat irregular (Fig. 3e)

Download English Version:

https://daneshyari.com/en/article/3242495

Download Persian Version:

https://daneshyari.com/article/3242495

Daneshyari.com