ORIGINAL RESEARCH PAPER

Plastic Surgery

MANAGEMENT OF EAR INJURIES IN FACIAL BURNS

KEY WORDS: Burn Care Time, Healing Re-Epithelialization Time ,Fasia ,Topical Antibiotics

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ABSTRACT

Objectives : To compare the effect of standard topical antibiotic management versus a fascia cover wound closure for mid-partial thickness burns of the ear and face.

Methodology: 30 cases of either sex and age b/n 12 to 45 years with no comorbities were taken from burn and plastic department and divided into two random groups.They were treated with topical antibiotics and in the other group temporalis fasia or biological skin substitute wound closure was used .

Results : Total daily burn care time, pain (0–10 scale) and healing time were monitored . We found a significant decrease in wound care time 0.35±0.1 versus 1.9±0.5 h, decrease in pain of 2±1 versus 4±2 and re-epithelialization time 7±2 versus 13±4 days in the fasia covered /skin substitute group compared to topical antibiotics

Conclusion. : We conlude from our study that fascia covered burn wounds are easy to take care ,have less pain and reepitheliazation of these wound takes less time The ultimate goal is to attain consistent, satisfactory, and favorable result, the appearance of a normal ear. There is need for individualistic approach for the management of fascial burns.

INTRODUCTION

The ear constitutes only a small portion of total body surface area, but is one of the most sophisticated and important morphological structure of the body. To normalize external ear appearance following burns is one of the most challenging jobs for a plastic surgeon. Post burn ear reconstruction is more difficult because of deficit of available tissues. Approximately 35% of burn patients sustained burns over face. From the host of procedures available, suitable procedure was selected depending on site of deformity surrounding available skin.[1,2]

DeSanti L et al also studied pathophysiology and current management of burn injury .They postulated that superficial ear burns are managed similarly to facial burn injuries; however, external pressure should not be applied to the injured helix. The cartilage in this area is already poorly vascularized and any compression will potentiate further injury. Pressure control includes removing pillows or pressure while sleeping. Deeper burns need more potent topical therapy, usually with a silver or mafenide cream. Chondritis, or cartilage infection, is a major complication and leads to loss of cartilage and permanent deformity. Systemic antibiotics are required .[3,4]

The burn wound and pulmonary system remain the major foci for infection in this population. Less common types of infection include suppurative thrombophlebitis, suppurative chondritis, bacterial endocarditis, urinary tract sepsis, sinusitis, intra-abdominal sepsis, and infections of the eyes. Prophylaxis protocols involve proper control of the environment and an anticipation of bacterial colonization. A number of specific monitoring and treatment guidelines have evolved that have proved effective over the years in minimizing morbidity and mortality.[3]

Luterman A et al did their work on infections in burn patients. Systemic sepsis resulting from invasive infection remains the leading cause of death among patients hospitalized with major thermal injury. Prevention of infection and death in burn patients requires a thorough knowledge of the multiple predisposing factors involved and expert application of appropriate diagnostic, supportive, and therapeutic modalities. The improved survival in this population is a result of all of these factors, not any one. It is this principle and the adherence to a treatment program that encompasses all the modalities which are so essential in the care of burn patients if continuing progress is to be made in this field. [5]

METHODOLOGY

30 cases of either sex and age b/n 12 to 45 years with no comorbities were taken from burn and plastic department and divided into two random groups.They were treated with topical antibiotics and in the other group biological skin substitute wound closure was used .

In our study the demographic status, laterality was reported to be on right side in 46%, left 31 O/O and bilateral in 23% cases. Temporoparietal fascia had to be used due to lack of healthy surrounding skin, treated by excision &grafting.

Complications included a less satisfactory contour definition in total ear reconstruction in 2 cases in which Temporoparietal fascia was used. Small area of skin necrosis over reconstructed ear occurred in another case with secondary healing. In cases of cervical tube reconstruction scar over neck is an added deformity. Patchy of full thickness skin grafting in case of converse flap which also healed without intervention.

On the whole no significant complications were encountered .We did not come across a single case of cartilage extrusion (Temporoparietal fascia was used in all cases of total ear reconstruction) External auditory meatal contracture .In our study there was a female preponderance, most of them sustaining accidental burns, while cooking. Patients also had associated contracture over neck, limbs which had to be treated on priority basis.

OBSERVATION TABLES

TABLE 1: WOUND CARE TIME

No. of hours	Group A	Group B	significance
0-1/2 hours	2	12	significant
1/2-1 hours	11	3	significant
1-2 hours	2	0	Not significant

TABLE 2: PAIN SCORING (VAS)

Pain Score	Group A	Group B	significance
0-3	0	2	Not significant
3-6	6	11	significant
6-8	9	2	Significant
8-10	0	0	Not significant

TABLE 3: REEPITHELIAZATION TIME

No. of days	Group A	Group B	significance
2-4 days	0	1	Not significant
5-8 days	1	6	Not significant
8-12 days	3	6	Not significant
13-16 days	11	2	Significant

RESULTS

30 patients were studied, with 15 patients in the fascia covered /skin substitute group. We found a significant decrease in wound care time 0.35±0.1 versus 1.9±0.5 h, decrease in pain of 2±1 versus 4±2 and re-epithelialization time 7±2 versus 13±4 days in the skin substitute group compared to topical antibiotics.

STASTISTICAL ANALYSIS

Data was analyzed using SPSS 20 statistical package. A descriptive analysis was done on all variables to obtain a frequency distribution. The mean + SD and ranges were calculated for quantitative variables. Continuous variables were compared by the Student t test. Proportions were analyzed with the chi-square test. A P value of 0.05 or less was considered statistically significant

DISCUSSION

Multistage procedures are commonly required for post burn ear deformity. Total ear reconstruction requires careful preoperative planning, adequate hemostasis and meticulous fabrication of cartilage framework. Triangular fossa and scapha should be made as wide as possible to achieve better contour definition. Helical rim needs special care, which we augmented by topping over of floating rib cartilage over base block.

Temporoparietal fascia flap had to be used in all cases of total ear reconstruction due to lack of availability of surrounding healthy skin. Rib cartilage has traditionally been the material of choice for ear reconstruction and we did not come across any significant complication postoperatively.

We didn't come across recurrence of keloid in case of postburn keloid excision and grafting. If patient prefers, prosthesis is to be offered. Thus the patient should be fully informed about all possible treatment options. For lobule defects, Converse flap should be planned one I third times greater than the required, to compensate for 1 full thickness skin graft contraction and secondly, suture the flap to helical rim to get a better contour definition '.

Similar to our study ,Demling RH et al worked on management of partial thickness facial burns (comparison of topical antibiotics and bio-engineered skin substitutes). This study compared the effect of standard topical antibiotic management versus a biological skin substitute wound closure for mid-partial thickness burns of the face. Adult patients with mid-dermal facial burns produced by flash flames or flame exposure were studied using a randomized prospective study design. Total daily burn care time, pain (0–10 scale) and healing time were monitored. Immediately after partial thickness debridement, the entire face burn, including ears, was closed with a bioengineered skin substitute coated with fibronectin (TransCyte) or treated by the open technique using bacitracin ointment applied 2–3 times daily.Results were comparable with our study.[6]

In study of Demling RH et al 21 patients were studied, with 10 patients in the skin substitute group. We found a significant decrease in wound care time 0.35±0.1 versus 1.9±0.5 h, decrease in pain of 2±1 versus 4±2 and re-epithelialization time 7±2 versus 13±4 days in the skin substitute group compared to topical antibiotics. They concluded that a bioengineered skin substitute significantly improves the management and healing rate of partial thickness facial burns, compared to the standard open topical ointment technique.[6]

Cotlar SW et al did reconstruction of the burned ear using a temporalis fascial flap. Temporoparietal fascia flap had to be used in all cases of total ear reconstruction due to lack of availability of surrounding healthy skin. Rib cartilage has traditionally been the material of choice for ear reconstruction and they did not come across any significant complication postoperatively.[7]

Spira M, et al divided ear injuries into categories and treatment for each . Assiduous attention to relatively minor details is considered of primary importance in the successful management of these injuries. With proper initial care and similar postoperative follow-up care, many deformities can be minimized or prevented even in the more severe injuries. It would reward those involved in the treatment of these injuries to recognize their serious nature and treat them accordingly.[8]

Pomahac B et al worked on restoration of facial form and function after severe disfigurement from burn injury by a composite facial allograft. Composite facial allotransplantation is emerging as a treatment option for severe facial disfigurements. The technical feasibility of facial transplantation has been demonstrated, and the initial clinical outcomes have been encouraging. Composite facial allotransplantation, along with minimal and well-tolerated immunosuppression, was successfully utilized to restore facial form and function in a patient with severe disfigurement of the midface.[9]

We had 3 cases of post burn lobule loss which were reconstructed by converse method (1 958)'. This flap gives promising results provided it is marked 113 times greater than the actual defect to compensate for full thickness graft contraction . Cervical tube was used in a single case of helical defect ten cases with disadvantage of donor site morbidity. Small to full thickness defects 1.5 cm in width were repaired with composite grafts5 from unaffected ear in 3 cases (Day 1921, Adams 1952) Anteroposterior sandwich flap was used in a single case of burnt ear with fuse lobule with neck skin. Single case of external auditory meatus contracture was treated by release and inlay grafting with satisfactory results .

Rigano W did antibiotic iontophoresis in the management of burned ears Severe deformities of the ears are a distressing problem after burn injury. Antibiotic iontophoresis has been used in the management of burned ears in patients; there were 145 ear burns in 92 consecutive patients who received prophylactic penicillin or gentamicin iontophoresis. A retrospective analysis of all patients who were admitted to the burn unit from 1967 to 1983 was done to review the outcome for patients with burned ears when conventional treatment was used. The incidence of infection, need for chondrectomy, and ear infection were virtually eliminated by management with antibiotic iontophoresis. In addition, no complications were noted when antibiotic iontophoresis was used. The authors concluded that antibiotic iontophoresis provides a safe, simple, and effective way to manage burned ears and thereby limits postburn ear deformities.[10]

Marks MW et al worked on the temporal island scalp flap for management of facial burn scars.. Facial burn scars are difficult to conceal and often preclude an aesthetic rehabilitation of the patient. Multistaged scalp and neck flaps have been described to provide hair-bearing skin to resurface burn scars in men.. The temporoparietal facia has been well described in recent years, and the understanding of this anatomy has facilitated the use of the island scalp flap for more distal transfers .[11,12]

Burke JF et al did successful use of a physiologically acceptable artificial skin in the treatment of extensive burn injury. A bilayer artificial skin composed of a temporary Silastic epidermis and a porous collagen-chondroitn 6-sulfate fibrillar dermis, which is not removed, has been used .. The anatomic structure of the artificial dermis resembles normal dermis and serves as a template for the synthesis of new connective tissue and the formation of a "neodermis," while it is slowly biodegraded. This artificial skin has physiologically closed excised burn wounds for periods of time up to 46 days before the Silastic epidermis was removed. At the time of election when donor sites are ready for reharvesting, the Silastic epidermis is removed from the vascularized artificial dermis and replaced with 0.004 autoepidermal graft in sheet or meshed form. Clinical and histologic experience in a relatively short follow-up period (2--16 months) indicates that "neodermis" retains some of the anatomic characteristics and behavior of normal dermis, thus promising improvement in the functional and cosmetic results, as well as providing physiologic function as a skin substitute.[13,14]

CONCLUSION:

We conlude from our study that fascia covered burn wounds are easy to take care ,have less pain and reepitheliazation of these wound takes less time .Although tremendous changes have been made in the management of burn injury, treatment of these wounds remains a challenge. This continuing education activity addresses how treatment modalities must be continuously adapted to the changing wound biology, as dictated by the burn injury process, the host's response to injury, and the wound environment.

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