



OPEN DRESSING IN MANAGEMENT OF SECOND DEGREE BURN IN A BURN UNIT

General Surgery

Akhilesh Ratnakar Department of Surgery, Bundelkhand Medical College, Sagar, MP, India

Kaushlendra Singh Narwariya Department of Surgery, Bundelkhand Medical College, Sagar, MP, India

Ayush Singh Tomar Department of Surgery, Bundelkhand Medical College, Sagar, MP, India

ABSTRACT

This study was to evaluate the results of open dressing in management of second degree burn in patients.

Methods: A retrospective study conducted on patients with second degree burn during the period of 11 months 19 days from January 2018 to December 2018.

Results: 196 patients were included in this study. Age range was 1.5 Months to 80 years. 45.40% of patients were within 20 years. 66.3% injured by hot water, 21.9% by hot liquids, 7.1% by hot cooking related substance and 4.5% due to flame. Only 12.75% patients showed positive culture of pathogenic organisms. Among them, 7 had a combined growth of *Pseudomonas aeruginosa* and *E. Coli*. 4 (2.04%) patient needed skin grafting. 46.42% patient stayed in hospital up to 10 days and only 21 patients stayed >30 days. It was also noted that healing was faster in younger (<30 years) age group as compared to adult age group.

Conclusion: Second degree burn can manage by open method effectively and successfully. Regular cleansing of the burnt wound with clean water application of moist exposed burn ointment (MEBO) can easily be taught to the attendants.

KEYWORDS

Second Degree Burn, Open Dressing

INTRODUCTION:

In the developing countries like India, around 7 million persons suffer from burn injuries, out of which, 7 lakh need hospital admission and 2.4 lakh become disabled. It is said that burn is one the most devastating causes of social, functional and psychological impairments in the whole world.¹

In 2003, a population based survey reported, burn was fifth leading cause of child health illness among the children of 1-17 years age group in Bangladesh. The overall incidence of burn was 288.1 per 100,000 children

per year and the morbidity was 0.6 per 100,000 children of same age group.²

Total 23,000 people died due to burn in the year 2000 around the whole world. Among them the majority occurred in low and middle income countries.² Burn injury was second most common surgical problem in pediatric age group in the department of pediatric surgery, Dhaka Shishu (children) Hospital.³

In the management strategy of the burn patient, one must first assess the overall physiologic status of the patient as with trauma related injury, the primary and secondary survey are performed in accordance Trauma Life Support standered.⁴ after the primary assessment a burn specific secondary survey should be performed that include a detailed assessment of the burn wounds and others.⁵

Traditional burn wound management involved applying topical antibiotic in dressing until the Escher separated.⁶ practically, the burn wound is better treated with dressing. Small children tend to prefer injured site to be covered with dressings.⁷ The case is different with adult population. There are many reported methods regarding management of the burn wound. Open or exposed, semi-closed or closed technique, with or without topical antibiotics, has all been advocated. The aim of open methods is drying up the burnt area as quick as possible, leaving tissues to heal under a dry crust.⁸

The open dressing reduces healing time and re-epithelialization time and promotes early elimination of crusts. However, open dressing make it more difficult for patient with large burned areas to move and the occlusive dressing allows for the patient to move freely.⁹ Total management costs of burned patients is very high as it depends on lengthy hospital stay and demands multidisciplinary teams. Local care

of burn wounds continues to account for a large proportion of the cost per day for treating patients with burns. Dressing costs, however, can vary according to the size and depth of the burned area, the type of dressing used and the occurrence of complications.⁹ Many believe that the closed technique is ideal for management of second degree burn wounds. But Gosselin et al found the open or exposure technique is better for the resource-poor, low-income developing countries, in terms of reduced morbidity, length of hospital stay and treatment cost.⁸ Despite, a developing country with limited resources, every year we are spending huge amount of money, working hours and man power for the management of burn wounds and their complications.

MATERIAL AND METHODS:

This retrospective study was conducted during the period of 11 months 27 days from January 2018 to December 2018, in the Burn unit of the Department of General Surgery, Bundelkhand Medical College, Sagar. Patients aged between with <80 years with second degree superficial burn, >10% TBSA (total burn surface area) with involving any region of the body and any % TBSA involving the hands, feet, face and perineum admitted with second degree burn and whom treated by exposed or without closed dressing were included in this study.

Patients arrived more than 24 hours after burn, burn with other systemic illness e.g.-Protein Energy Malnutrition, Cerebral Palsy, Myopathy, Neurological Disorders, etc were excluded.

We included and evaluated only those patients from the hospital records, whom were managed by same protocol of burn management.

Prophylactic intravenous broad spectrum antibiotics (Inj. Cephadrine, Inj. Flucloxacillin and Inj. Amikacin) were given. Initial analgesia was provided by injectable narcotic analgesic (pethidine), then per rectal Diclofenac Sodium oral Paracetamol. Oral Promethazine HCl and oral H2 blocker (Ranitidine) was also given.

The burn surface area initially cleaned with normal saline (0.9% NaCl), then 2% Silver Sulphadiazine was applied keeping the wound uncovered or exposed. Patients were instructed to take daily bath using warm water followed by cleansing of the burn surface by normal saline and application of 2% Silver Sulphadiazine cream again.

Close follow up and inspection of the wound was done and any signs of wound infection (discharge, foul smell, pyrexia) were recorded. Wound swab was taken on the 3rd day after admission for culture & sensitivity test.

If there was a presence of purulent exudates, persistent pyrexia or devitalized tissue that could not be removed by above mentioned procedure, decision of doing a surgical procedure was taken.

Patients were discharged when wound healed up without any pyrexia and no need for further procedure. The following records were evaluated - evidence of bacterial wound infection, any operative procedure under general anaesthesia, total number of days stayed in the hospital, and average cost of treatment per patient which includes admission fees, bed rent, operation charges, cost of various pathological investigations, cost to purchase intravenous fluids, normal saline, antiseptic cream, drugs and other dressing related materials etc.

RESULTS:

During the study period of 11 months and 27 days, the admitted burn patients was about 15% of total general surgical admission at Bundelkhand Medical College, Sagar. Out of them 196 patients with second degree superficial burn (scald) included in this study.

The lowest age was 1 Month 15 Days and the highest age was 80 years. The age distribution is shown Figure-1.

Among the study population, (54.59%) patient were male and (45.41%) patients were female.

Hot water, hot liquids like hot tea, hot milk, hot dal, hot rice water etc and flame were the main burning agents. Highest, (66.3%) by hot water and (4.5%) due to flame. Table-2.

Out of 196, only 25(12.75%) patients showed positive culture of pathogenic organisms. Among seven of them had a combined growth of *Pseudomonas aeruginosa* and *E. coli*. (Table-II) Culture sensitivity reports revealed that *Staphylococcus aureus* was sensitive to flucloxacillin, Cephadrin and Ceftriaxone antibiotic. *Pseudomonas* was sensitive to Gentamycin and Imipenem antibiotics.

Infection was treated by using these sensitive antibiotics.

Figure 1: Distribution of age of the patient (N=196)

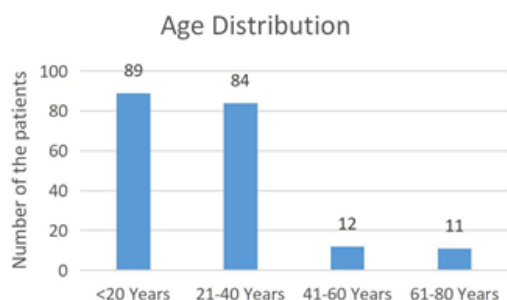


Table I : Burning Agents (N=196)

Burning Agents	Number of patients	Percentage
Hot Water	130	66.3%
Hot Liquids	43	21.9%
Hot Cooking related substance	14	7.1%
Flame	09	4.5%

Table II : Wound Infective Agents (N=25)

Microorganisms	No. of patients	%age
Staphylococcal aureus	12	48%
E.Coli.	6	24%
Pseudomonas aeruginosa & E.Coli.	7	28%

Twenty (13.3%) patients needed wound cleansing or debridement under general anaesthesia only two to five times each. But only 4 (2.04%) patients needed skin grafting.

Most of the patients (46.42%) stayed in the hospital up to 10 days and only 21 patients stayed >30 days. Table-3.

Table III : Length of Hospital stay (N=196)

Days	No. Of Patients	%age
Upto 10 days	91	46.42

11 to 20 days	57	29.08
21 to 30 days	27	13.77
> 30 days	21	10.71

DISCUSSION

After initial Advanced Trauma Life Support (ATLS) management to save the burn patients life, the next issue is to reduce the possible immediate early morbidity by prompt resuscitation according to initial planned management protocol of burn wound management. Still today there is no single technique which is universally applicable for all types of burnt wound.

Common causative agents of burn in pediatric as well as adult age group are hot water, hot liquid (tea, milk, rice water etc.), hot vegetable/curry, and flame.¹⁰ The reports are similar to our study, which showed most common agent was hot water and least common was flame burn. Wound infection rate was significantly lower in this study. Three types of microorganisms were identified for the wound infection. Gosselin et al reported significant reduce wound infection rate in patients treated with open technique, which is similar to our present study. The infection rate was found to be lower in open dressing method in comparison to closed dressing.

We managed all those patients by open dressing method. Demling RH et al mentioned, second degree superficial burn patients need 3-5 dressing in every 1-2 days interval¹¹. As, in close method, burn dressing should change regularly, it is very difficult to maintain in a developing country. On the other hand, in open method the burn unit worker or even the patients can apply local ointments after bathing the patient and clean the wound daily. More over, in some particular areas of the body like perineum, upper part of thigh, gluteal region close dressing is difficult, where open or exposed method is feasible.

To reduce the pain of the patient and to decrease psychological and physiological trauma, burn dressing should always be done under general anaesthesia.¹² we did all the dressing, which included wound cleansing, debridement under general anaesthesia.

We observed that most of the studied stayed in the hospital less than 10 days. This is similar to the study of Atiyeh et al.⁶ Hospital stay depends on the other factors also like depth of burn, wound infection, percentage of total burn surface area (%TBSA), number of operative procedures. Our results of open method are similar to the study of Gosselin et al.⁸ Most of the cases in this study did not need general anaesthesia for wound care, thus mean management cost was less in those. The cost was increased when procedures done under general anaesthesia. However, the cost depends on the economic status of the state.

CONCLUSION:

Second degree burn can manage by open method effectively and successfully. Regular cleansing of the burnt wound with clean water and application of moist exposed burn ointment (MEBO) can easily be taught to the attendants.

REFERENCES:

- Lawrence JC. Burns and scalds; etiology and prevention. In: Settle Ad, ed. Principles and practice of burn management, 1st ed. Edinburgh: Churchill Livingstone, (1996), 3-13.
- Mashreky SR, Rahman A, Chowdhury SM, Giasuddin S, Svanstrom L, Linan M, Shafinaz S, Uhaa IJ, Rahman F. Consequences of childhood burn: Findings from the largest community-based injury survey in Bangladesh. Burns, (2008)34,912-918.
- Masood AFM, Khan AR, Islam KM. Surgical problems I children- 10 years survey in Dhaka Shishu (children) Hospital. Dhaka Shishu (children) Hospital Journal, (1991),7,24-29.
- Duffy BJ, McLaughlin PM, Eichelberger MR, Assesment, Triage, and Early Management of burns in children, Clinical Pediatric Emergency Medicine, (2006),7,82-93.
- Shukla PC, Sheridan RL. Initial evaluation and management of burn patients. (2003), EMedicine.com Available at: www.Emedicine.com
- Atiyeh BS, Dham R, Kadry M, Abdullah AF, Al-oteifi M, Fathi O, and Samir A. Benefit cost analysis of moist exposed burn ointment. Burns, (2002),28,659-669.
- Carolyn R. Pediatric Burn. In: Settle Ad, ed. Principles and practice of burn management, 1st ed. Edinburgh: Churchill Livingstone, (1996), 377-379.
- Gosselin RA, Kupper B. Open versus closed management of burn wounds in low income developing country Burns, (2008),34,644-647.
- Torrati FG, Rossi LA, Ferreira E, Dalri MCB, Carvalho EC and Barberia CBS. Analysis of cost of dressings in the care of burn patients, Burns, (2000),26, 289-291.
- Saif Ullah M, Ferdous KMN, Haider MM, Sarwar MKA, Alam MR and Khan AR. Management of pediatric second degree burn in a developing country: wit or without close dressing?, Chattagram Maa-O-Shishu Hospital Medical College Journal, (2013), 12(2),35-40.
- Demling RH, Way LH. 1994, 'Burn and other thermal injuries' in :Current Surgical Diagnosis And Treatment. Way LW 9ed). 10th edn. Norwalk:Lange Medical Book, (1994), 241-56.
- Simons MA, Kimble RM. Pediatric Burns. In: International Encyclopedia Of Rehabilitation. (2010), Available at: <http://currie.buffalo.edu/encyclopedia/en/article/119/>