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Role of Burns-Manual in Burns Management

Neljo Thomas[1] and Ravi Kumar Chittoria[2,*]

[1]Senior Resident, Department of Plastic Surgery, Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER), Pondicherry, India

[2]Professor & Registrar (Academic), Head of IT Wing and Telemedicine, Department of Plastic Surgery & Telemedicine, Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER), Puducherry, India

[*]**Corresponding author:** Ravi Kumar Chittoria, Professor & Registrar (Academic), Head of IT Wing and Telemedicine, Department of Plastic Surgery & Telemedicine, Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER), Puducherry, India

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Abstract

Electric burns are known for difficulty in healing and wound management. There is a lack of growth factors in these chronic wounds and needs to be supplemented with adjuvant therapy that allows for faster healing we have used the JIPMER burns manual to allow the management to be protocol based.

Keywords: Burns- manual, Electric burns, protocol

Abbreviations: JIPMER: Jawaharlal Institute of Postgraduate Medical Education and Research

Introduction

Adult wound healing is divided into three stages: the inflammatory phase, proliferative phase, and remodelling phase. The three stages have to occur in conjunction to result in wound healing. Wound bed preparation is a novel concept and can be summarized using T.I.M.E with T for tissue: non-viable or deficient. I for infection/inflammation, M for moisture balance. E for epidermis which was changed to E for an edge **[1]**. Large wounds often require a graft or flap for wound coverage, which requires wound bed preparation. Protocol-based management helps to streamline the management and decrease the incidence of pitfalls.

Materials and methods

This study was conducted in the Department of Plastic Surgery at a tertiary care centre after getting the departmental ethical committee approval. Informed written consent was taken from the patient. The details of patient in the study were a 14-year-old female without any known comorbidities with a history of accidental electric burns from the low voltage source and sustained circumferential 3rd to 4th-degree burns over the scalp frontal region **(figure 1)** We used the manual for burns management **(Annexure 1)** in electric scalp management and have found it to be useful.

Results

The wound bed showed good granulation tissue and showed healing **(figure 2)**. Using the burns manual to manage such complicated cases helped to make the management evidence-based and with minimal flaws.

Annexure 1 JIPMER BURNS MANUAL

On receiving a Burn Patient

J. **Management of a New Patient on Arrival**

✓ Emergency management (ABCDE)

✓ Remove all rings/ Bangles/ Jewellery from the patient

✓ Start IV Line/ Venesection if required. Central line > 50 % Burn

✓ Analgesics to be given

✓ Assessment of burn area

✓ Inform the faculty

✓ Admission if required and bed available

✓ To fill history sheet

✓ Make sure MLC is registered and informed the Police

✓ All investigation forms

✓ To complete treatment sheet

✓ To write consultation depending on the case like pain clinic/Anesthesiologist, Medicine, Ophthalmology, OBG, Psychiatry, Nasogastric tube/ENT

✓ Ward procedure to be completed RT/Catheterization for all admitted patients

K. **IV Fluid Regimen:** Parkland formula

Preferably RL (Hessterile for non-responding shock)

DNS/ Saline/5% Dextrose if indicated

a. **In 1st 24 hours:**

4 ml/kg/% of the burn area

50% of calculated volume in the first 8 hours from the time of burn

If burn > 50% for all calculations total percentage is taken as 50%.

b. **2nd 24 hours:**

50% of the calculated volume

L. Catheterization (1ml x Kg body weight) ≈50 - 100 ml/hr

M. **Maintenance fluid**

a. For child

4 ml/kg/hr for first 10 kg

2ml/kg/hr for 10-20 kg

1 ml/kg/hr for 20-30 kg

Above 30 kg like adult- 2500 ml/day

b. For renal shutdown

18 amp of Lasix (36 ml) + 14 ml NS at a rate of 6 ml/hr for 6 hr

N. **Investigations:**

a. **All investigations on Admission**

Hb%, PCV,

TC/DC, Platelet Count,

ESR, Urine,

LFT, RFT,

S. Electrolytes, IgG, IgM,

Chest Xray, ECG, ABG if required

Blood group, Serum Protein, Albumin, Globulin,

HIV & HBs Ag.

Wound Swab C/S Day1, Day 3 & once a Week or when ordered

b. **In major burns:**

✓ Investigations once in 48 hrs if critical

✓ Once the patient is stable, Investigations once a week

c. **In operated cases:**

All investigations-

✓ Post OP

✓ Day 3

✓ Day 7

O. Following Discharge against Medical advice

✓ Complete case sheet and Police information

✓ Take the statement of the nearest relative on the Case record's first page and a separate sheet

P. Following the Death of the patient

✓ Inform faculty

✓ Complete IP records

✓ Complete Police information and other medico-legal formalities

✓ Send body to Mortuary

Q. Following Discharge

✓ Enter Discharge record (DOA, DOS, DOD, Diagnosis, and Treatment)

✓ Complete case sheet

✓ Complete progress record

✓ Write post-operative events

✓ Write the condition of the patient on discharge

✓ Write advice (Drugs, Dressing, Physio/Occupational therapy)

✓ If required get them reviewed by a specialist who has seen them during admission

✓ Date and time of follow-up

✓ OPD Days Tuesday/ Thursday

R. Pre-operative

✓ Check for Investigations,

✓ Part preparation,

✓ Follow anaesthetist order,

✓ Antibiotics,

✓ Arrange blood,

✓ POP and any other action needed

S. Following Operation (Major/Minor)

- ✓ Post-op order to be given
- ✓ Operation registers to be filled.
- ✓ Hb% and Electrolyte and other investigations as required
- ✓ OT notes to be written
- ✓ Any other necessary action as required

T. Rounds

- ✓ Morning round with Faculty
- ✓ Afternoon round with or without faculty
- ✓ Evening Rounds (8 pm) By Resident alone and report to the faculty concerned
    - Before rounds
    - ✓ Renew doctor order, Daily complete order to be written clearly with signature
    - ✓ Check the vitals; auscultate the chest and abdomen of all critically ill patients.
    - ✓ Enquire about patient problems and take appropriate action
    - ✓ Check case sheets/ Discharge/ Investigations/ any other matter
    - ✓ Inform faculty in charge of the patient
    - ✓ Check duration and dose of the medicine
    - ✓ Antibiotic and Analgesics
    - ✓

U. Emergency Duty

- ✓ Inform staff on duty
- ✓ Investigation to be sent
- ✓ Complete case sheets and MLC
- ✓ Take emergency action

V. Daily check:

- ✓ Clinical Examination of the patient
- ✓ (Examination and recording of findings of the unstable patient are mandatory) Heart, chest, abdomen, consciousness level, vitals and local examination etc.
- ✓ All original investigation to be signed by the resident and any finding/ important findings to be brought to the notice of the staff
- ✓ Daily renewal of treatment and progress report
- ✓ Do not write repeat all
- ✓ Antibiotic dose and No. of days given etc.

Discussion

Burn injury is a major cause of trauma to the human body, with a long healing period. The mortality rate of burn injury has decreased with new treatment modalities, but secondary infections and prolonged healing periods still affect the mortality rates. Many therapeutic methods are available to affect wound healing such as the topical application of insulin, growth factors, negative pressure-assisted wound closure, oxidized regenerated cellulose/collagen, hyaluronic acid conjugated with glycidyl methacrylate or gelatine dressings.

JIPMER Tertiary Burn Centre

Doctors Order

Patient Name: BSA Involved:
Hospital No.: Weight:
Date and Time:

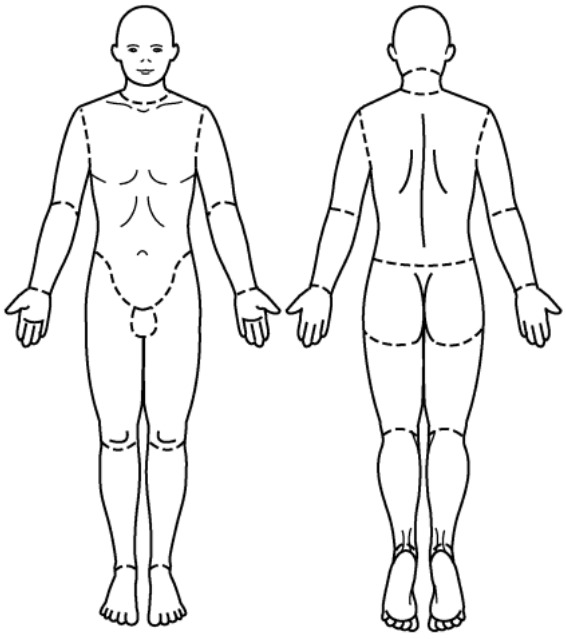
• **Tetanus Prophylaxis** Inj TT 0.5ml IM Stat (If indicated) • **Antibiotics** Inj Clox Inj Genta Inj Ceftriaxone Other: • **Analgesics** Pethidine/Morphine Tramadol Ketamine Pain Clinic Consultation/Anesthesiologist • **IV fluids** Ringer lactate (4ml/kg/%burns) ✓ First 8 hrs (From……..to…….) Amount Rate ✓ Next 16 hrs (From……to……) Amount Rate • **If in shock** ✓ Fast fluid Rate ✓ Plasma volume Expander • **Antacids & H_2 receptor blocker** • **Add to IV fluids** Multivitamin- 1 amp in one bottle 50 ml of 50% dextrose in each bottle of RL • **Steroid (if indicated)**	• **NPO** • **Oxygen Inhalation** 4 litres/ml by mask/ prong • **RT aspiration** hourly • Catheterization/Venesection/Venepuncture • **Dressing;** Collagen or Conventional closed • Consultation (If required) ✓ Pain ✓ Medicine ✓ Eye ✓ Gynec ✓ Psychiatry • TPR/BP/Intake Chart hrly • Inform SOS Make sure Medico-legal formalities including Police information is completed • Position of the patient • Water bed • **If orally allowed** ✓ Immune boosting Omega 3 fatty acid Glutamine ✓ Prevention of Bacterial translocation Probiotic (Econorm) Vitamin in double doses (B Complex, Vit C)	**Investigations** Urine Routine & M/E Hb, TC/DC PCV S.Electrolytes Blood Urea/Creatinine RBS Total Protein/A/G Blood Group & Crossmatch HBsAg/HIV ABG (If indicated) ECG (If indicated) Myoglobin in Urine (If indicated) CK/CKMB (If indicated) Radiological Investigation (If indicated) **Signature**

JIPMER Tertiary Burn Centre

BURN AREA ESTIMATION

Name:	Hosp. No:	Tele-Med. No:
Age:	Sex:	Burn Reg No:	Date & Time:

Burn Area



	Birth 1 yr.	1–4 yrs.	5–9 yrs.	10–14 yrs.	15 yrs.	Adult	Burn size estimate
Head	19	17	13	11	9	7	
Neck	2	2	2	2	2	2	
Anterior trunk	13	13	13	13	13	13	
Posterior trunk	13	13	13	13	13	13	
Right buttock	2.5	2.5	2.5	2.5	2.5	2.5	
Left buttock	2.5	2.5	2.5	2.5	2.5	2.5	
Genitalia	1	1	1	1	1	1	
Right upper arm	4	4	4	4	4	4	
Left upper arm	4	4	4	4	4	4	
Right lower arm	3	3	3	3	3	3	
Left lower arm	3	3	3	3	3	3	
Right hand	2.5	2.5	2.5	2.5	2.5	2.5	
Left hand	2.5	2.5	2.5	2.5	2.5	2.5	
Right thigh	5.5	6.5	8	8.5	9	9.5	
Left thigh	5.5	6.5	8	8.5	9	9.5	
Right leg	5	5	5.5	6	6.5	7	
Left leg	5	5	5.5	6	6.5	7	
Right foot	3.5	3.5	3.5	3.5	3.5	3.5	
Left foot	3.5	3.5	3.5	3.5	3.5	3.5	

Total BSAB _____

Superficial

Deep

Total

Other External Injuries:

Soot: Y/N

Kerosene Smell: Y/N

Wound condition:

Fresh/Pus+/Slough+

Granulation: Present/Absent

Healthy/ Unhealthy

Healed wound

Previous grafted wounds

Date of burn:

Time of Burn:

DOA: EMS: JTBS:

TOA: EMS: JTBS:

LMP (if applicable)

Referred from (Hospital, Name of Doctor)

Signature
Name of Doctor
MCI Reg. No:

JIPMER Tertiary Burn Centre

Burn Diet Chart

Total (Approx.) Calorie = 3000 K cal. Total (Approx.) Protein = 120 gm

Date: Name: Age: Sex:

Hospital No: Diagnosis:

Time:	Diet
6 AM	Milk 200 ml + Sugar 2 tsp (10gm)
7 AM	Crushed Idli (2-3) + Milk 200 ml
8 AM	Coconut water 200ml
9 AM	Bread (4-5 slices) in Milk 200 ml
10 AM	Coconut water 200ml/ Fruit Juice 200 ml
11 AM	Milk 200 ml + Sugar 2 tsp (10gm)
12 Noon	Fruit Juice (any variety) 200 ml
1 PM	Crushed Idli + Milk 200 ml + Sugar 3 tsp (15 gm)
2 PM	Rice water/ Ragi- 200 ml
3 PM	Milk 200 ml + Egg- 1/ Chicken- 50 gm/ Protein Powder 2 tsp (10gm)
4 PM	Fruit Juice/ Sugarcane Juice – 200 ml
5 PM	Milk 200 ml + Protein Powder 2 tsp (10gm)
6 PM	Rice Water / Ragi – 200 ml
7 PM	Bread 4-5 slices + Milk 200 ml + Sugar 2 tsp (10gm)
8 PM	Milk 200 ml + Protein Powder 2 tsp (10gm)
9 PM	Coconut Water 200 ml
10 PM	Milk 200 ml + Banana
11 PM	Fruit Juice/ Sugarcane Juice 200 ml
12 MN	Rice Water 200 ml
1 AM	Milk 200 ml + Protein Powder 2 tsp (10gm)
2 AM	Milk 200 ml + Bread 4-5 slices
3 AM	Milk 200 ml + Sugar 2 tsp (10gm)
4 AM	Fruit Juice 200 ml
5 AM	Bread 4-5 slices + Milk 200 ml

Pain Management **Rest Pain- Adult** Inj Tramadol hydrochloride 100 mg in 50 ml= 2 mg/ml Inj. Midazolam hydrochloride 10 mg in 50 ml= 0.2 mg/ml Inj. Ketamine hydrochloride 100 mg/50ml= 2 mg/ml	**Dose** 2 ml bolus at 5 min intervals till VRS<3 Then infusion at the rate of 1 ml/hr. to 2 ml/hr.	**Neuropathic pain** Cap Pregbalin 75 mg BD Tab Tryptomer 10 mg HS
Pediatric Inj Tramadol hydrochloride 50 mg in 50 ml= 1 mg/ml Inj Midazolam hydrochloride 5 mg in 50 ml= 0.1 mg/ml Inj Ketamine hydrochloride 50 mg in 50 ml = 1 mg/ml	**Dose** 2 ml bolus at 5 min intervals till VRS<3 Then infusion at the rate of 1 ml/hr. to 2 ml/hr.	
Stepped up dosage during dressing and physiotherapy	**Dose** A bolus of 2 ml 10 minutes prior to dressing removal. During dress change and physiotherapy increase infusion to 0.2 – 0.5 ml/kg/hr. For 50-60 kg patient rate of 10-30 ml/hr.	

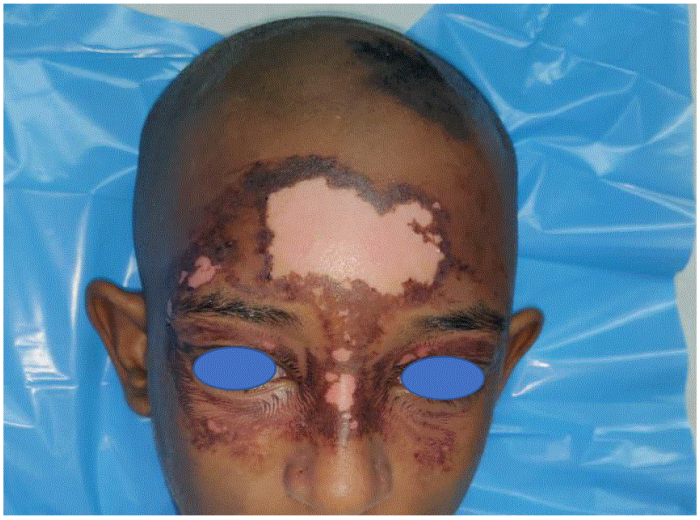


Figure 1: burns at presentation

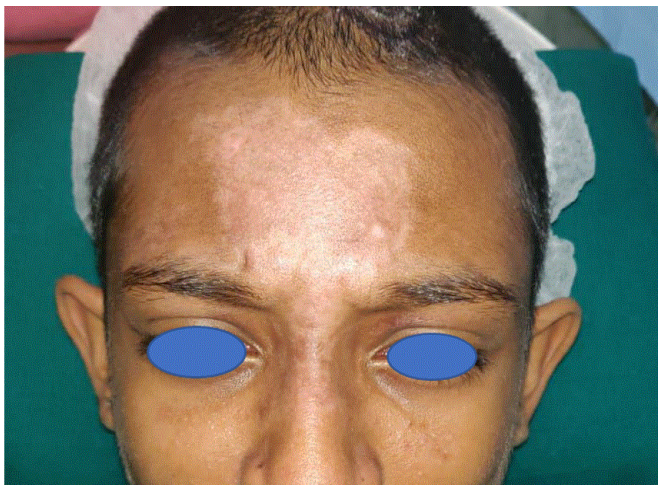


Figure 2: burns wound after healing

There are various guidelines for the management of burns including the ABC management, emergency management, treatment and rehabilitation including the ISBI **[2]**, WHO **[3]**, Australian guidelines **[4]**, US guidelines **[5]**, however, there is no single burns manual for the management of burns patients. However, all these guidelines direct on how to manage the burns patient, which can be confusing and cumbersome. We have made JIPMER burns manual to allow for a ready-reckoner so that the doctor gets direction on what has to be done next when faced with a problem during the management.

JIPMER burns manual was made in the year 2015 after compiling the various international guidelines. It is a 12-page document. The manual contains the following headings-

A. Management of a New Patient on Arrival
B. IV Fluid Regimen
C. Catheterization
D. Maintenance fluid
E. Investigations
F. Following Discharge against Medical advice
G. Following the Death of the patient
H. Following Discharge
I. Pre-operative
J. Following Operation (Major/Minor)
K. Rounds
L. Emergency Duty
M. Daily check

We have tried to include all the problems encountered by a surgeon/plastic surgeon in burns management in our proforma for proper assessment and care. Proforma based management helps not to miss any important findings or investigations. It also helps to maintain a checklist which can be a guide through the investigations and management. It also helps to keep track of the various treatment options and advice given at previous visits. However, it has to be used as a guide. It has to be individualised to each patient and the condition in which they present. In government hospitals where there are various residents taking care of one patient, it helps to keep track of the stage of management. The checklist for the surgeon in the peri-operative period will ensure that all the standard protocols are followed, which helps both in effective patient care and streamlining of the support staff for increasing efficiency. It will help not only in the management of patients but also help in more easy access to information in case the patient needs to be referred to another centre. It also helps in maintaining a data bank for future analysis and publications.

Conclusion:

We have used JIPMER burns-proforma and found it to be useful. The study was done on a single patient and needs a large population-based study to apply in practice.

Declarations

Financial support and sponsorship: None.

Conflicts of interest: None.

Disclosure: None

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