

80% TBSA Burns Insult and Back to Life Success Story of a 2 Year Old Boy

Prajwal M¹, Vinitha K Anirudhan², Krishnakumar K S³, Ajit Kumar Pati⁴,
Niranjana Suresh⁵

How to cite this article:

Prajwal M, Vinitha K Anirudhan, Krishnakumar K S *et al.* 80% TBSA Burns Insult and Back to Life Success Story of a 2 Year Old Boy. *J of Pla Sur and Trans.* 2024;5(1):21-25.

Abstract

Pediatric burns account for around 25% of burn cases. Pediatric thermal burns affecting >10% TBSA are usually advised hospitalization. With burns of above 60% TBSA holds a high risk of mortality. Extensive thermal burns especially in toddlers is extremely challenging, due to their low body reserve, risk of hypothermia, metabolic and nutritional disturbances and reduced donor sites, low compliance towards physiotherapy, resulting in significantly high mortality and morbidity. Even extensive pediatric burns could be salvaged with immediate medical attention, coordinated involvement of multidisciplinary team, Aggressive surgical intervention and physiotherapy. This multidisciplinary approach not only prevents death but also allows the patient to return to a near normal life after the incident.

Keywords: Allograft; CMV infection; Hypermetabolic state.

INTRODUCTION

Pediatric burns account for around 25% of burn cases.¹ Pediatric thermal burns affecting >10% TBSA are usually advised hospitalization.² Burns above 60% TBSA holds high risk of mortality.³ Extensive thermal burns especially in toddlers

is extremely challenging, due to their low body reserve, risk of hypothermia, metabolic and nutritional disturbances and reduced donor sites, low compliance towards physiotherapy, resulting in significantly high mortality and morbidity. We share our challenges and experiences in successfully rehabilitating a 2 year old boy back to near normal life from an 80% burn injury.

CASE PRESENTATION

Two-year-old boy presented with alleged history of fall from height (8–9 feet) to a burning heave of garbage on 14th May of 2020. He presented to our emergency department with 2nd to 3rd degree burns involving face, anterior chest, bilateral upper & lower limbs, gluteal region approximately 80% TBSA, within 6 hours of the incident. He was

Author Affiliation: ¹Resident, Department of Plastic Surgery, ²DNB Fellowship, Department of Pediatric Intensive care, ³HOD, ⁴Senior Consultant, ⁵DNB, Department Plastic Surgery, Aster MIMS Hospital, Calicut, Kerala 673016, India.

Corresponding Author: Vinitha K Anirudhan, DNB Fellowship, Department of Pediatric Intensive care, Aster MIMS Hospital, Calicut, Kerala 673016, India.

E-mail: vinithakanirudhan@gmail.com

Received on: 15-01-2024

Accepted on: 02-07-2024



electively intubated & admitted in paediatric ICU. Initial CT head, abdomen & pelvis done showed features of mild SAH, EDH and pulmonary contusion. At the time of admission, child was hypothermic with features of hypovolemic shock and a saturation around 95% at room air. He was resuscitated with intravenous fluids for the first 48hrs according to modified parkland formula. Neurosurgery consultation was sought for Subarachnoid Hemorrhage & advised conservative management. On day 2 of admission, he was taken up for fasciotomy of bilateral forearm & dorsum

of hand in view of impending compartment syndrome along with he underwent scrubbing and bovine collagen application. Post operatively he developed hypernatremia & anaemia which was managed accordingly. On 8th post burns day, he was extubated. On post burns day 10, he developed high grade fever, which on evaluation showed growth of *Acinetobacter*, *Klebsiella* in his blood culture & initiated treatment with appropriate antibiotics. He underwent Tangential excision of Bilateral Lower limb and Vacuum dressing application on his post burns day 11. After multiple Debridements + VAC



dressings of the affected areas over next 3 weeks. The blood groups of mother and son was found identical. On his post burns day 37, he underwent Split thickness skin allografting from his mother, covering all burn areas except buttocks and posterior part of B/L Lower limb. As most of the allografts were taken up over 12 days, on his PBD

49 he underwent allografting for face and Bilateral Lower limb from the same donor. During his post op period he had multiple fever spikes, for which he was managed with appropriate antibiotics. Around 2 months post burns, multiple well circumscribed nodules with central depression over his grafted sites were noted for which skin biopsy was taken.





Biopsy was normal with no granuloma or fungal elements & no signs of GVHD, but CMV DNA PCR came positive and was treated with Valganciclovir for 6 weeks. He continued to have low grade fever spikes with culture reports normal. Hence

considered hypermetabolic state & treated with propranolol & anti-inflammatory drugs. On his day 102 of burns injury, he was discharged with patchy raw areas.



2 Year Post OP - Face



2 Year Post OP - Body



2 Year Post OP - Lower limb



2 Year Post OP - Lower limb

He was on weekly follow-up thereafter, along with daily dressing changes, physiotherapy. On Day 127 he was taken up for debridement and autografting. All the grafts settled well.

He is now 4years old, attending preschool and doing his daily routine activities. At present he has some residual contractures over the dorsum of right foot and left MF and RF.

DISCUSSION

Flame burns involving a high percentage of TBSA in a closed space significantly increases the risk of inhalational injury. In this case it was further aggravated by fall from height sustaining an SAH and EDH. However, the kid was received in a tertiary care center within 6hours and was immediately intubated allowing us to secure the airway. Adequate resuscitation in an isolated intensive care unit helped the kid survive the initial critical period.

We reempha size on the importance of immediate or early bovine collagen application followed by early tangential excision (Within day 5 to day 10) to reduce the incidence of sepsis. Cadaveric skin grafting was discussed but as the parents were unwilling, we decided to use allograft from

his mother. We delayed allograft to make sure the wound bed and general condition is optimal. We did allograft SSG in two sittings to allow the anterior wound to heal before keeping the kid prone so as to allow smooth posterior SSG healing. Application of allograft reduces the amount of water, electrolyte and protein being lost.⁴ It also promotes epithelisation and there by prepares the wound for future autograft transplantation.⁵ The graft take in the kid was approximately 80% with no GVHD. The kid was not given any immunosuppressors as the graft was good and skin biopsy showed no GVHD.

During his prolonged hospital stay, the kid suffered from viral infection (CMV) but there was no fungal infection. The parents were counselled thoroughly so they motivated the kid to participate in physiotherapy which prevented DVT and Cardiac vegetations. Regular blood cultures, doppler evaluation of lower limb vessels, echocardiography were done at regular interval to rule out complications of prolonged hospital stay.

Hypermetabolic state or a catabolic response after major burns injury results in a state of impaired immune response⁶, which will gradually turn on infections which results in sepsis later. The state of sepsis will eventually damage various organ systems.

Managing pediatric burns in this newer generation with involvement from all possible multi specialized units of care, not only prevents death from happening but do delivers a nearly normal life beyond the insult.

CONCLUSION

Even extensive pediatric burns could be salvaged with immediate medical attention, coordinated involvement of multidisciplinary team, Aggressive surgical intervention and successful rehabilitation.

REFERENCES

1. Sharma, Ramesh Kumar, and Atul Parashar. "Special considerations in paediatric burn patients." *Indian journal of plastic surgery* 43.S 01 (2010): S-43S50.
2. Tenenhaus M, Rennekampff HO. Treatment of superficial burns requiring hospital admission. UpToDate, Waltham, MA.[pristupljeno 6. travnja 2020.].
3. Jeschke, Marc G., et al. "Morbidity and survival probability in burn patients in modern burn care." *Critical care medicine* 815-808 :(2015) 43.4.
4. Gupta, Saurabh, et al. "Human skin allograft: Is it a viable option in management of burn patients?." *Journal of Cutaneous and Aesthetic Surgery* 12.2 132 :(2019).
5. Kagan, Richard J., Edward C. Robb, and Ronald T. Plessinger. "Human skin banking." *Clinics in laboratory medicine* 605-587 :(2005) 25.3.
6. Moins-Teisserenc, H el ene, et al. "Severe altered immune status after burn injury is associated with bacterial infection and septic shock." *Frontiers in immunology* 58 :(2021) 126195.

