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CASE REPORT

From Crisis to Recovery: A Success Story in Pediatric Burn Care

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ABSTRACT

Background: Burn injuries in pediatric patients pose significant challenges due to their unique physiology, increased susceptibility to infections, and high metabolic demands. Malnutrition and hypoalbuminemia further exacerbate the complexity of management, increasing morbidity and mortality risks.

Case Report: We report the case of a 3-year-old female child who sustained scald burns involving the face, chest, and left upper limb. She presented nine days post-injury in critical condition with persistent diarrhea, abdominal distension, systemic signs of sepsis, and severe hypoalbuminemia. Initial resuscitation included broad-spectrum antibiotics, antifungal therapy, and albumin infusions. Chemical debridement with papain-urea dressings was employed, followed by surgical debridement and split-thickness skin grafting of affected areas. Postoperatively, she required intensive care support, including inotropes, blood transfusions, and enteral nutrition. Multidisciplinary collaboration among pediatric intensivists, plastic surgeons, nutritionists, and specialized nursing staff facilitated stabilization and recovery. The patient was discharged in satisfactory condition and continues to recover well under regular follow-up.

Discussion: This case underscores the critical importance of a multidisciplinary approach to managing pediatric burn injuries, particularly in malnourished patients with systemic compromise. Early resuscitation, infection control guided by culture sensitivity, nutritional optimization, and timely surgical intervention are vital to achieving favorable outcomes. Challenges such as caregiver education and financial constraints highlight the need for comprehensive care plans and sustained follow-up to ensure optimal recovery.

Conclusion: Pediatric burns in the context of malnutrition and sepsis require meticulous management through a multidisciplinary team approach. This case illustrates successful outcomes, despite significant challenges, emphasizing the importance of early intervention, aggressive infection control, and nutritional rehabilitation.

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CASE PRESENTATION

A 3-year-old female child presented with a history of scald burns sustained after falling into a pan of boiling water, causing injuries to her face, chest, and left upper limb. Initially treated at a local district hospital, she was transferred between several healthcare facilities before being referred to our center nine days post-injury due to deteriorating condition, abdominal distension, and persistent diarrhea.

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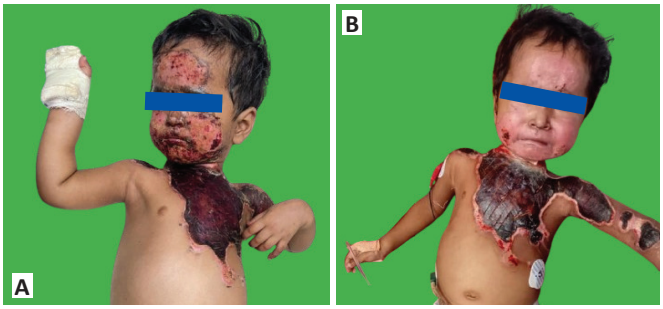

Figure 1 (A&B): A-Wounds on presentation with deep eschars **B-**Releasing incisions given over eschars.

On dmission, the child exhibited signs of systemic compromise, including tachycardia, tachypnea, hypotension, and irritability. Her body mass index (BMI) was 17 kg/m^2, and she appeared cachectic with abdominal distension and anasarca. Burn evaluation revealed superficial second-degree burns on the face and mixed-depth second-degree burns on the chest and left upper limb, with thick eschars present.

After stabilization and resuscitation, the child was admitted under the Plastic Surgery Department. She was started on high-grade antibiotics (Meropenem and Polymixin B) and fluconazole, given the severity of her infected wounds. Blood, urine, and wound cultures were obtained prior to antibiotic initiation. To address severe hypoalbuminemia, 20% parenteral albumin infusion was administered.

Chemical debridement with papain-urea dressings was used during her optimization for surgery. On post-burn day 16, surgical debridement was performed under general anesthesia. Despite an uncomplicated procedure, she developed persistent hypotension on post-burn day 18, requiring inotropic support and transfer to the Burn ICU. Enteral feeds were initiated via a Ryle's tube, and the patient received multiple blood transfusions.

Figure 2: Serial bedside debridements done during unstable phase .

Figure 3: Formal debridement done under general anesthesia after optimising the child.

Over the subsequent 10 days, inotropic and oxygen support were gradually tapered. Based on urine culture sensitivity, Linezolid was introduced, and 10% L-amino acid infusion was started to improve protein levels. Once stabilized, she underwent debridement and split-thickness skin grafting for raw areas on her neck, chest, and left upper limb. Post-surgery, neck extension was maintained using a soft neck collar.

Her postoperative recovery was closely monitored in the Burn ICU and later in the burn ward. Minor graft losses were observed on the neck and chest during subsequent dressings.

On postoperative day (POD) 8, the Ryle's tube and Foley catheter were removed, and the child was transitioned to oral feeds. By POD 10, she was discharged in a stable condition with ongoing follow-up for partial graft loss in the neck and chest regions. The patient continues to recover well under regular outpatient supervision.

DISCUSSION

Burn injuries remain a significant global health burden, particularly among children under the age of five, who are disproportionately affected.

Figure 4: Post op Day 1 of Debridement and Split skin grafting of wounds.

Figure 5 (a&b): Post op day 10 status- Minor graft loss present.

Scald injuries, the most common type of thermal injury in this age group, account for over 65% of pediatric burn cases.[1] These injuries often result from accidents in domestic settings, underscoring the need for enhanced prevention strategies.

The pathophysiology of burn injuries in children differs significantly from adults, due to their immature immune systems, higher metabolic demands, and reduced physiological reserves. These factors increase their susceptibility to infections, malnutrition, and sepsis, which are leading causes of morbidity and mortality in pediatric burn patients.[2,3]

Figure 6: Status of the child 1 month following discharge. All residual wounds have epithelialised.

Infections complicate recovery by exacerbating systemic inflammation, impairing wound healing, and increasing the risk of multi-organ failure.[4]

In this case, the child presented with multiple challenges, including malnutrition, severe hypoproteinemia, and highly infected wounds. Hypoproteinemia, commonly observed in pediatric burn patients, is associated with delayed wound healing, increased susceptibility to infections, and impaired recovery.[5] Addressing nutritional deficits through parenteral albumin and amino acid infusions, as well as enteral feeding, played a critical role in this patient's recovery.

Optimal management of pediatric burns requires a multidisciplinary approach involving pediatric intensivists, plastic surgeons, nutritionists, physiotherapists, and specialized nursing staff.[6] Early and aggressive resuscitation is essential to restore hemodynamic stability, followed by surgical debridement and grafting to reduce infection risk and accelerate recovery.[7] In this case, use of papain-

urea dressings facilitated chemical debridement in the acute stage, while split-thickness skin grafting minimized raw areas and restored functional mobility, particularly in the neck and chest regions.

The role of culture-guided antibiotic therapy in preventing septic complications is paramount. In this patient, the timely administration of Meropenem, Polymixin B, and Linezolid, based on culture sensitivity results effectively controlled infections. Antifungal therapy with fluconazole also addressed the risk of secondary fungal infections, which are increasingly reported in burn patients with systemic compromise.[8]

Despite logistical challenges, such as limited caregiver education and financial constraints, the use of a structured, multidisciplinary approach enabled the successful management of this complex case. Post-discharge follow-up and caregiver education remain critical components of long-term care, particularly for preventing contractures and ensuring optimal functional recovery.[9]

CONCLUSION

This case highlights the complexity of managing pediatric burn injuries in the presence of systemic compromise, malnutrition, and infection. A multidisciplinary approach, emphasizing early resuscitation, infection control, nutritional optimization, and timely surgical intervention, is essential to achieving favorable outcomes. Sustained follow-up and caregiver education are vital to ensure long-term functional and aesthetic recovery.

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