

Case Study: Post-Burn Sequelae with Bilateral Knee Flexion Contractures in a Pediatric Patient

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Abstract: *This case study discusses a pediatric patient presenting with severe bilateral knee flexion contractures and a chronic non-healing wound following burn injuries. The patient exhibited a 60-degree flexion deformity in both knees and an unstable, non-healing wound on the right thigh. Clinical and radiological assessments guided a surgical plan involving contracture release, debridement, and split-thickness skin grafting (SSG). This case highlights the importance of timely surgical intervention and rehabilitation in preventing long-term deformities and restoring functional mobility in post-burn pediatric patients.*

Keywords: Post-burn contracture, Pediatric burns, Knee flexion deformity, Skin grafting, Burn rehabilitation, Chronic wound, Functional recovery

1. Introduction

Burn injuries are among the most devastating forms of trauma, often resulting in long-term physical and psychological complications. One of the most common and challenging sequelae of deep dermal or full-thickness burns is the development of contractures, particularly when healing occurs by secondary intention or when wounds are inadequately managed. Post-burn contractures are characterized by the tightening of skin and underlying tissues, leading to restricted joint mobility, deformity, and functional impairment.

Burn injuries, especially when severe, can lead to complex complications, including post-burn contractures. These contractures are a common sequela in pediatric patients, where the combination of deep burns and improper initial care can lead to long-term joint deformities. Contractures typically result from the formation of fibrous scar tissue, which restricts joint movement. In children, these deformities are particularly concerning as they can hinder growth and development, leading to permanent disabilities if not addressed promptly. Early surgical intervention and a multidisciplinary treatment approach, including skin grafting and rehabilitation, are key to preventing further impairment and restoring normal function.

In pediatric patients, the impact of contractures is even more significant due to their ongoing growth and development. The skin in children is more elastic, but immature healing responses and improper scar management can result in the formation of tight fibrous bands across joints. If left untreated, contractures can progress over time, leading to severe disability, postural abnormalities, and psychological distress.

The knee joint is a common site for post-burn contractures, especially in patients with circumferential or large surface area burns of the lower limbs. Flexion contractures in this region hinder ambulation, sitting, and other daily activities, greatly affecting the child's independence and quality of life. Early recognition and timely surgical intervention such as

contracture release and skin grafting—are crucial to restore function and prevent recurrence.

This case study focuses on a pediatric patient with bilateral knee flexion contractures and a chronic non-healing wound because of post-burn sequelae. It illustrates the complexity of managing such cases and emphasizes the importance of a multidisciplinary approach in achieving optimal outcomes.

Patient Information:

Age: 6 years

Sex: female

History: Post-burn sequelae involving bilateral lower limbs

Presenting Complaint: Restricted knee movement and non-healing wound over the right thigh

Past medical history

6 years old female child sustained flame burns while trying to do pooja at home on her own on 20.1.24. Her skirt caught fire following which the accident was immediately recognized by her brother, the fire was doused, and the child was taken to hospital immediately. There, collagen sheet was applied, and dressings were done on alternate days. No skin cover procedures were performed. The wound over the lateral aspect of right thigh has not healed. Since last 2 months, the child has developed contractures of both the knees.

Clinical Findings:

Right Leg:

Healed hypopigmented immature scar, circumferential

Flexion contracture of knee – 60 degrees

Unstable, non-healing wound (5x5 cm) on posterolateral lower thigh

Left Leg:

Flexion contracture of knee – 60 degrees

Contracture band over medial aspect of knee joint

Anterior, lateral, and posterior aspects of the left thigh uninvolved

Volume 14 Issue 4, April 2025

Fully Refereed | Open Access | Double Blind Peer Reviewed Journal

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Radiological Findings:

X-ray: Articular surfaces of the knee joints appear normal

Diagnosis:

Post-burn sequelae with bilateral knee joint flexion contractures and chronic raw area on the right thigh

Treatment Plan:

Release of contractures of both knees

Split-thickness skin grafting (SSG) of the defects and raw area

Debridement of the chronic wound

Surgical Considerations:

The goal of surgery is to restore joint mobility, enable weight-bearing and ambulation, and promote healing of the chronic wound. Given the extent of the contractures, a staged surgical approach may be considered along with postoperative physiotherapy for optimal functional recovery.



Articular surfaces of the knee joints



Non-healing wound (5x5 cm) on posterolateral lower thigh



Anterior, lateral, and posterior aspects of the left thigh uninvolved



Restricted knee movement

2. Discussion

123, *Advanced Drug Delivery Reviews*. Elsevier B.V.; 2018. p. 3–17.

Burn-induced contractures are common, especially in children, and occur when extensive scar tissue forms around joints, restricting movement. This patient's bilateral knee contractures and chronic wound highlight the severe limitations that can arise from burns, especially when initial wound care and rehabilitation are inadequate. The condition often worsens over time, causing deformities that affect both function and appearance. In cases like this, timely surgical intervention is essential for restoring motion and preventing long-term disability. The absence of joint destruction, as seen in the radiographs, is a positive factor, allowing for a more favorable surgical outcome.

The treatment strategy involves a combination of contracture release and skin grafting to restore skin integrity and prevent further restriction. Post-surgical care, including physiotherapy, is critical to maintaining range of motion and preventing the recurrence of contractures. Early intervention, along with appropriate wound care and physiotherapy, can significantly improve long-term outcomes for burn survivors.

3. Conclusion

Comprehensive management involving surgical release, grafting, and rehabilitation is essential in pediatric patients with burn contractures. Early recognition and treatment can prevent such deformities and facilitate better functional outcomes.

Post-burn contractures are one of the most disabling long-term complications following burn injuries, particularly in the pediatric population. In this case, bilateral knee flexion contractures and a chronic non-healing wound presented a significant challenge to both mobility and quality of life. The severity of the flexion deformities measured at 60 degrees bilaterally—highlighted the need for timely and definitive surgical intervention.

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