



Overcoming Adversity: Comprehensive Rehabilitation of a Pediatric Burn Survivor

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Introduction:

Deepak, a resilient 3-year-old boy, faced unimaginable challenges after being involved in a devastating house fire, resulting in extensive burns covering 60% of his total body surface area (TBSA). His injuries were compounded by severe complications including compartment syndrome, sepsis, and respiratory issues, leading to the necessity of bilateral below-knee amputations due to decreased circulation to his feet.

Following acute care at a local burn centre, Deepak was transferred to a rehabilitation hospital to commence his journey towards recovery. Upon admission, he presented with multiple open wounds requiring meticulous wound care and grafting procedures for wound closure. Additionally, he faced significant limitations in range of motion (ROM) at both knee joints and upper extremities.

The rehabilitation team employed a multidisciplinary approach to address Deepak's complex needs. Serial casting of both knees facilitated the restoration of functional ROM, while occupational and physical therapy interventions focused on enhancing hand function, activities of daily living (ADLs), and bed mobility. Prosthetic training was initiated, albeit with setbacks such as open wounds and differential growth rates of his lower limb bones.

Despite challenges, Deepak's perseverance and the collaborative efforts of the rehabilitation team enabled significant progress. He transitioned from static to mobile standing, then to ambulation using prostheses, initially with assistance and later independently. Scar management, including injections and surgical interventions, addressed hypertrophic and keloid scarring, ensuring optimal physical and psychological outcomes.

As Deepak continues his rehabilitation journey, he now independently ambulates community distances with the aid of advanced prosthetic technology. With ongoing scar management and prosthetic adjustments, he is poised to integrate into school-based physical therapy services and outpatient care, embodying resilience and determination in the face of adversity.

Case Description:

Deepak is a 3-year-old boy who was involved in a house fire, sustaining 60% TBSA burns to his face, trunk, upper extremities, and lower extremities. He developed severe compartment syndrome, sepsis, and respiratory complications in addition to his massive burns. He was treated at a local burn centre. During his acute hospitalization, he developed decreased circulation to both feet and required bilateral below-knee amputations. He underwent local wound care and multiple grafting procedures to achieve wound closure. After a prolonged hospitalization, he was transferred to our rehabilitation hospital for further care. Initially, he had multiple open wounds that required daily dressing changes as well as graft care. He had significant loss of ROM at both knees (stuck in extension) as well as limited ROM at his upper extremities. He underwent serial casting of both knees into flexion, which was quite successful in achieving functional ROM. He required occupational therapy and physical therapy to regain the use of his hands, ADLs, bed mobility, and preparation for prosthetic training. He began prosthetic training but had a setback as he developed an open wound at the end of one stump and accentuated the growth of his fibula faster than his tibia on the other stump. This precluded gait training for several months. Once his open wound had healed, new liners and sockets were developed to relieve pressure on both areas, and he was cleared to begin standing. He began a standing program both static at the edge of a mat and in a mobile-prone standing frame. He had stubbies, which he tolerated well, and began ambulation about 4 days after starting standing. He progressed to platforms on his pylons and quickly to SACH feet. He is ambulating 200 feet with a rolling walker and supervision. His lack of normal knee flexion is limiting his ability to transition as well as ascend and descend stairs. Owing to nerve damage to his left hand, he was unable to utilize Lofstrand crutches and worked toward independent ambulation without an assistive device. He continues to work on fine motor skills with occupational therapy. He has developed several sites of hypertrophic and keloid-type scarring on his face, neck, upper extremities, trunk, and lower extremities. He is utilizing custom compression garments with a mask, jacket, and pants. His new prosthetic liners are custom-fit and provide excellent compression for his lower extremities while being worn. While out of the prostheses, he has a custom compression garment that he tolerates well. He has undergone injections of steroids at the keloid scar on his neck and had a Z-plasty done to release the neck scar. He participated in our day hospital rehabilitation program for 5 months and then transitioned to outpatient care. He required scar revision surgery for the back and side of his head/neck. For this, he underwent tissue

expander placement at his scalp. This enabled the surgeon to have enough non-burn/scar tissue to cover the previous defect. Once the tissue expanders were removed, the scarred tissue was excised and the non-scarred tissue moved into its place. He is now independently ambulating community distances with new prostheses and Impulse feet by Ohio Willow Wood. This energy-storing foot has allowed him to achieve better heel strikes and push-off during the gait cycle. He can now ascend and descend a full flight of stairs and practice bus steps with supervision. He will receive school-based physical therapy services as well as continue with outpatient services to address his ongoing scar management and prosthetic needs.

References:

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