



The benefit of physiotherapy in preventing post-burn sequelae- A case report

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ABSTRACT

Background

Burn injuries require a multi-disciplinary approach including psychological, surgical and rehabilitative. Physiotherapy is proven to be extremely helpful in the recovery process of such patients. Rehabilitation also helps in preventing post-burn sequela which is responsible for hindering the process.

Patient Information

A 36-year old female presents with burn injury caused by flame at her house 4 months ago. She was admitted to a local hospital where she received initial treatment. However, no physiotherapy sessions were done at the time. She was discharged with primary treatment alone due to inability to pay hospital bills. Now, the patient has come to our hospital with contractures developed on her anterior neck, shoulders and elbows bilaterally. She is a case of 30 % TBSA and superficial and partial thickness burns. She was admitted for contracture release with flap reconstruction. After the surgery, physiotherapy call was started. The sessions included educating and counselling the patient and relatives, maintaining joint integrity, teaching anti-contracture positioning, respiratory hygiene and teaching home exercise program.

Conclusion

Physiotherapy treatment given in the acute phase has proven to be helpful in preventing post-burn sequelae to a variable degree according to the literature. It is helpful in maintaining range of motion, preventing contractures and improving quality of life. This thus results in decreased surgical intervention and early recovery.

Keywords: burn, post-burn sequelae, rehabilitation, physiotherapy



INTRODUCTION

Burn injuries are devastating, disfiguring and disabling for the injured as well as the uninjured which requires a multi-disciplinary approach. Treatment of these injuries is long-term involving grafting and reconstructive procedures and physiotherapy sessions (1). The long-term rehabilitation goal for these patients is preventative i.e. to avoid contracture development and provide as much function as possible (2). The regain of functions however depends on various factors such as age, total surface area involved, type of burn injury, depth and the care received post injury. The upper extremities are heavily impacted by contractures, with the shoulder and elbow accounting for the great majority of contractures which ultimately hamper the simple daily activities along with the work activities (3). T.C.C. Hendriks (2022) concludes in his study that the major causes of contracture development in developing countries are delayed burn care and depth of burns, which is consistent with the literature present (4). Whereas in developed countries, the cause is said to be unawareness or the apprehension about medical expenses (5).

PATIENT INFORMATION

Here we present a case of a woman who is 36 years old presented with a burn injury affecting her neck, chest, shoulders and elbows bilaterally. She suffered the injury on 28/12/2021 due to a diesel container exploding nearby (fig. 1,2,3). She was taken to a nearby private hospital for immediate management. She was conservatively managed over there for 4 months after which she was referred to a tertiary care hospital for further management. She had developed contractures secondary to burns. The patient was scheduled for contracture release with flap reconstruction.



CASE FINDINGS

A consent was obtained from the patient in written format. The patient was informed regarding the examination and the treatment for her condition. Her vitals were stable at the time of assessment.

On observation, the patient was in supine-lying position with her neck flexed, shoulders in abduction, elbows flexed to 120 degrees (left) and right flexed placed on the abdomen. The lower limb was in neutral position (fig. 4,5,6).

On assessment, she recorded her pain to be a 5/10 on the VAS scale on movement. She had an available range of 30 degrees when measured from 90 degree of flexed elbow (left) whereas right elbow range was reduced by 20 degrees.

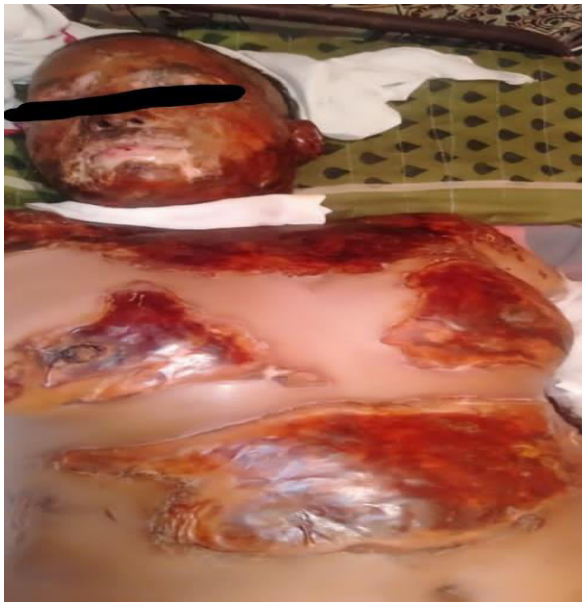


Fig. 1 Acute phase- thorax burn area



Fig. 2 Acute phase- facial and neck burn area



Fig. 3 Acute phase



Fig 4: patient on the day of assessment



Fig 5: Left elbow contracture on the day of assessment



Fig 6: right elbow contracture

Intervention:

The goals for this patient included maintaining the available range of left elbow joint while gradually increasing the range of right elbow joint, maintaining respiratory function, positioning of the affected regions and improving overall quality of life of the patient.

Goals:	Intervention:
Patient education	Educating patient and caregiver about the complications and secondary impairments of burn injuries and the importance of rehabilitation in the same
Maintaining joint integrity	Mobility exercises of all extremities in available pain-free range, stretching of the



	elbow contracture
Positioning	Keeping the patient in anti-contracture positions such as neck in extension using pillows, shoulder abducted to 90 degrees, elbow in extension
Maintain respiratory hygiene	Pursed lip breathing, Airway clearance techniques

DISCUSSION

Burn injuries caused by flames are the most commonly seen injuries which poses a greater risk for developing complications like contractures. These contractures are the main cause in delayed recovery and functional limitations faced by the patient. Once the contractures have developed, the patient requires surgical intervention and extensive rehabilitation to achieve functional range of motion in order to carry out basic activities in personal and professional life. The process can be tiring and painful for most of the patients.

DanTang et al. (2015) studied the impact of early on-intensive rehabilitation on the burn victims. They used Modified Barthel Index, WHO Quality of Life-BREF, VAS, Self-Rating Depression Scale and Self-Rating Anxiety Scale as a means to measure the effect of early rehabilitation. They found that the rehabilitation group showed excellent improvements in their daily activities and overall health (6).

Radha K. Holavanahalli et al. used stretching and paraffin wax as a means of treating shoulder contractures. He measured shoulder range of motion after every session and found that it yielded positive results(7).



Also, **Mario M. Celis et al. (2003)** while focusing on the paediatric group studies the effect of supervised exercise program on the recovery and functional status. The control group received conventional physiotherapy without any supervision. The author states the experimental group was easily able to return to daily activities as compared to the control group at the end of 12 months(8).

Our patient with an old flame injury covering her face, neck, shoulder, elbow and the upper thorax developed contractures as a result of improper treatment in the acute phase of the injury due to the financial problems. After that, she was treated with slow sustained stretching, positioning, range of motion exercises- passive, active assisted, active and respiratory hygiene care. The patient was also given IRR to promote healing of the tissues. Besides the inpatient program, the patient and the family were taught HEP. She was asked to follow-up on 3, 6, 9 months post discharge.

CONCLUSION

Physiotherapy treatment given in the acute phase has proven to be helpful in preventing post-burn sequelae to a variable degree according to the literature. It is helpful in maintaining range of motion, preventing contractures and improving quality of life. This thus results in decreased surgical intervention and early recovery.



REFERENCES

1. Sasor SE, Chung KC. Upper Extremity Burns in the Developing World: A Neglected Epidemic. *Hand Clin.* 2019 Nov;35(4):457–66.
2. Harden NG, Luster SH. Rehabilitation considerations in the care of the acute burn patient. *Crit Care Nurs Clin North Am.* 1991 Jun 1;3(2):245–53.
3. Schneider JC, Holavanahalli R, Helm P, Goldstein R, Kowalske K. Contractures in burn injury: defining the problem. *J Burn Care Res Off Publ Am Burn Assoc.* 2006 Aug;27(4):508–14.
4. Hendriks TCC, Botman M, Binnerts JJ, Mtui GS, Nuwass EQ, Niemeijer AS, et al. The development of burn scar contractures and impact on joint function, disability and quality of life in low- and middle-income countries: A prospective cohort study with one-year follow-up. *Burns.* 2022 Feb 1;48(1):215–27.
5. Essential Surgery: The Way Forward | SpringerLink [Internet]. [cited 2022 May 31]. Available from: <https://link.springer.com/article/10.1007/s00268-014-2937-9>
6. Tang D, Li-Tsang CWP, Au RKC, Li K cheng, Yi X feng, Liao L rong, et al. Functional Outcomes of Burn Patients With or Without Rehabilitation in Mainland China. *Hong Kong J Occup Ther.* 2015 Dec 1;26:15–23.
7. Holavanahalli RK, Helm PA, Kowalske KJ, Hynan LS. Effectiveness of Paraffin and Sustained Stretch in Treatment of Shoulder Contractures Following a Burn Injury. *Arch Phys Med Rehabil.* 2020 Jan;101(1S):S42–9.
8. Celis MM, Suman OE, Huang TT, Yen P, Herndon DN. Effect of a Supervised Exercise and Physiotherapy Program on Surgical Interventions in Children with Thermal Injury. *J Burn Care Rehabil.* 2003 Jan 1;24(1):57–61.