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## RESEARCH ARTICLE

### POST BURN CONTRACTURE OF HAND -TREATMENT AND ASSESSMENT IN TERMS OF QUALITY OF LIFE IN A TERTIARY CARE HOSPITAL OF NORTHERN UTTAR PRADESH

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#### ABSTRACT

**Background:** Burn not only affects the survivor's physical health, but it also affects the survivor's psychological state. The most important thing for burn patients is survival, and then comes the disability part. Scarring causes not only disfigurement and a restriction in range of motion, but also a reduction in quality of life in people who have a low mental state. **Material & Method:** A prospective study was conducted from January 2021 to February 2022 on 55 patients who visited the OPD of the Department of General Surgery, Mayo Institute of Medical Sciences, Barabanki, and Uttar Pradesh. The Institutional Ethics Committee (IEC) had granted ethical clearance. A questionnaire based on the EQ-5D-5L and a predictor of health-related quality of life (HRQL) was tabulated with MS-Office and SPSS version 21 software. **Result:** Young generations, with a preponderance of women from middle- to low-socioeconomic status, are the most affected in this study. EQ-5D-5L pre-operative questionnaire On the other hand, none of the burn contracture patients are in good health; 4-7 patients have a zero score. On evaluation of mental status, it was seen that all 55 patients had been facing anxiety and depression due to social fear, feeling disabled, and feeling helpless. After a year of follow-up, they have no social fear, depression, or anxiety and have happily returned to work, revealing a score of 100, which indicates excellent health. **Conclusion:** Burn survivors' mental health is impacted by post-burn hand contracture. Hence, it requires psychological counselling routinely as a part of the rehabilitation programme in order to improve the quality of life.

#### INTRODUCTION

The World Health Organization defines "burn" as an injury to the skin or the tissue caused by heat, radiation, electricity, friction, chemicals, etc. Burn is the leading cause of disability worldwide, accounting for more than 7 million disability-adjusted life years (DALY).<sup>[1]</sup> Burn injuries are most common in lower to middle socioeconomic groups, with a disproportionate number of children and women, primarily of reproductive age.<sup>[2]</sup> In developing countries like India, kitchen burns are common in the adult population, whereas the nature of burns in children differs from scald to flame in developed and developing countries, respectively.<sup>[3]</sup> Burn not only affects the survivor's physical health, but it also affects the survivor's psychological state. It is one of the leading causes of mortality and morbidity. The most important thing for burn patients is survival, and then comes the disability part.

Scarring causes not only disfigurement and a restriction in range of motion, but also a reduction in quality of life in people who have a low mental state.<sup>[4]</sup> This study will navigate towards the release of burn contracture by using Z-technique, insertion of Kirschner wire, grafts, flaps, rehabilitation, and assessing the quality of life pre- and post-operatively.

#### MATERIAL AND METHOD

**Study design and Study Subjects:** A prospective study was conducted from January 2021 to February 2022 on 55 patients who visited the OPD of the Department of General Surgery, Mayo Institute of Medical Sciences, Barabanki, and Uttar Pradesh. The Institutional Ethics Committee (IEC) had granted ethical clearance.

##### Inclusion criteria

- Age- 5-60years
- Burn due to electrical, chemical, flame, scald.
- Degree of burn- First, second and third degree
- Patients who had consented for the study

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**Exclusion criteria**

- Suicidal /Homicidal burn
- Patients with co morbidities- chronic debilitating illness, coagulation disorder, malignancy, mental disorder.
- Burn <2months
- Local site infection

**Study tool &Statistical analysis**

A questionnaire based on EQ-5D-5L and predictors of health-related quality of life (HRQL), such as demographic data, burn type, degree of contracture, and unemployment, was tabulated using MS-Office and SPSS version 21 software. Comparison made between pre-operative and post-operative emotional and physical well-being. This study also tells about the type of surgery performed along with rehabilitation.

**RESULTS**

Age distribution –Burn injuries are more common in the younger generation, i.e. those in their second and third decades of life. The mean age is 24.9 ±5.5 (Table 1)

**Table 1. Age distribution**

Age groups	No.of patients (F)	Mid-point (x)	Fx
5-15	12	10	120
15-25	18	20	360
25-35	15	30	450
35-45	6	40	240
45-55	4	50	200
55-60	0	57.5	0
Total	55		1370

Gender Distribution – Females are the most commonly affected, and the male to female ratio is 2:3, with 6 female children affected (Table 2).

**Table 2. Gender distribution**

Gender	Frequency
Male	22
Female	33

3.3. Kuppuswamy socio-economic scale –The middle class (49.0%) has the most burn cases, followed by the lower class (45.5%). 0.5% are from the upper class on the socio-economic scale, as depicted in Table 3.

**Table 3. Socio-economic scale**

Class	Score	Frequency
Upper	26-29	3
Upper middle	16-25	7
Lower middle	11-15	20
Upper lower	5-10	13
Lower	<5	12

Nature of burn –15 patients (Table 4) reported burns with hot oil, followed by 13 with hot milk. Electric burn and burned plastic burn share the same proportion, i.e 6 each.

Twelve patients presented with a history of flame burns while lighting religious diyas, igniting stoves, and using gas.

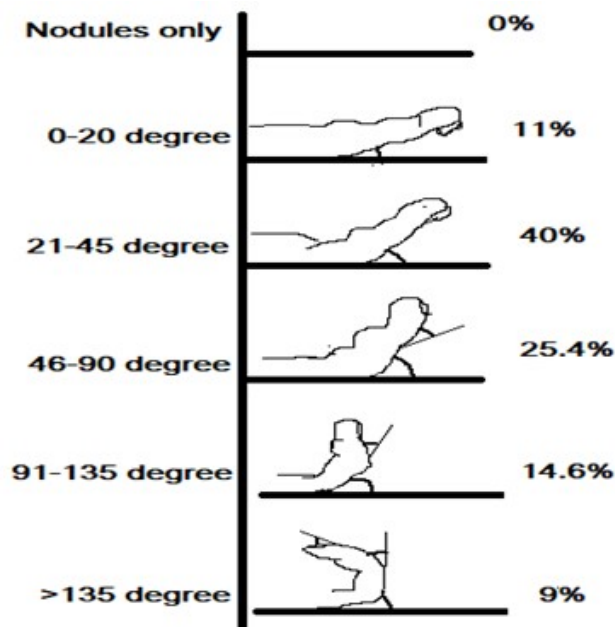
**Table 4. Nature of burn**

Nature of burn	Percentage (%)
Flame burn	21.8
Electric	10.9
Chemical	5.5
Hot oil	27.3
Hot milk	23.6
Burned plastic	10.9

Degree of burn and contracture –None of the 55 patients have first degree burns. 32 are from second degree deep burns, and 23 are from third degree burns. As shown in Figs. 1 and 2, the maximum degree of contracture was between 21 and 45°, with only 9% of patients having more than 135°.



**Fig. 1. Various degree of finger contracture pre-operatively**



**Fig. 2. Degree of contracture**

EQ-5D-5L pre-operative questionnaire-It has a scale from 0-100, where 0 represents bad health and 100 represents good health (Tables 5a and 5b)). On the other hand, none of the burn contracture patients are in good health; 4-7 patients have a zero score. 40% of patients had restricted finger mobility; 41.8% were unable to perform self-care independently; and 56.36% had difficulty with daily activities.

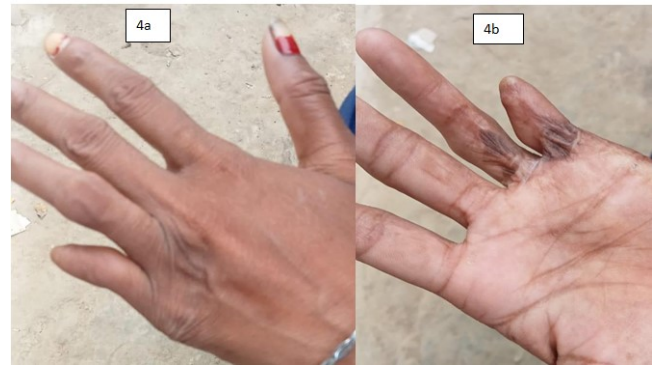
On evaluation of mental status, it was seen that all 55 patients had been facing anxiety and depression due to social fear, feeling disabled, and feeling helpless.

Table 5a. EQ-5D-5L questionnaire

Pointers	Mobility of hand/fingers	Self-care	Usual activities
No problem	n= 0	n= 0	n= 0
Slight Problem	n= 18	n= 23	n= 17
Moderate Problem	n= 15	n= 19	n= 31
Severe Problem	n= 22	n= 9	n= 7
Unable to do	n= 0	n= 4	n= 0

Table 5b. EQ-5D-5L questionnaire continued

Pointers	Pain / Discomfort	Anxiety and depression
No pain /anxiety	n=0	n=0
Slight pain /anxiety	n=24	n=18
Moderate pain /anxiety	n=19	n=18
Severe pain /anxiety	n=11	n=12
Extreme pain /anxiety	n=1	n=7



Skin grafts were taken from the lateral aspect of the thigh wherever they were required. K-wire is inserted into the finger to make it immobile so that wound healing and graft uptake will be up to their mark (Fig 3). Fig 3- shows Z-plasty, incision and release of contracture followed by skin grafting and immobilization by k-wire. 3.8.

Follow up –K-wire was removed in 3–4 weeks, graft uptake was normal, and no post-operative complications were encountered. Active physiotherapy was advised. Patients were followed up after 3, 6, 9, and 12 months (Fig4). At 1 year, there was no restriction in the mobility of the hand and finger; they could do all their daily activities and household work, which was restricted before. They no longer have social anxiety, anxiety, or depression and have happily returned to work, revealing a score of 100, indicating the best health.

**DISCUSSION**

A burn injury is a traumatic experience that not only leaves a scar on the body but also affects the victim's mental and emotional well-being. As a result, mental and social support are just as important as limb physiotherapy. [5]. [6] The various health assessment forms available are the Burn Specific Health Scale-Brief (BSHS-B), the SF-36, and the EQ-5D-5L (EuroQol Group 5-Level-5Q version). As there are no unified health survey guidelines available for burn patients, we have chosen the EQ-5D-5L questionnaire. This questionnaire has made the psychosomatic domain an important component to evaluate in burn patients. Hence, this study is unique because it has taken only hand contracture into account and tried to evaluate the psychosomatic domain along with a demographic profile in it.

Contracture is nothing but a fibroblastic and natural response of a wound to cause a hypertrophic scar, which results in restriction of range of motion of a joint, due to which there is impairment in daily activity, unemployment and depression. [7] This study corresponds to other writers in the context of having post-burn contracture seen in a young generation with a preponderance of women belonging to a middle-to-low socioeconomic status. [8] Treatment of post burn contracture is very essential, along with counselling to alleviate not only their physical status but also cure them psychologically. Therefore, the treatment offered to them in this study is similar to the suggestions made in the literature. [9] An assessment of the degree of contracture is important before making a decision on the type of surgical intervention. The surgical interventions used in this study were incision and release, Z-plasty, skin grafting, and immobilization by K-wire. [9]. [10] >45° contracture is more likely to necessitate skin grafting or flap surgery. [10]



Fig 3. Shows Z-plasty, incision and release of contracture followed by skin grafting and immobilization by k-wire

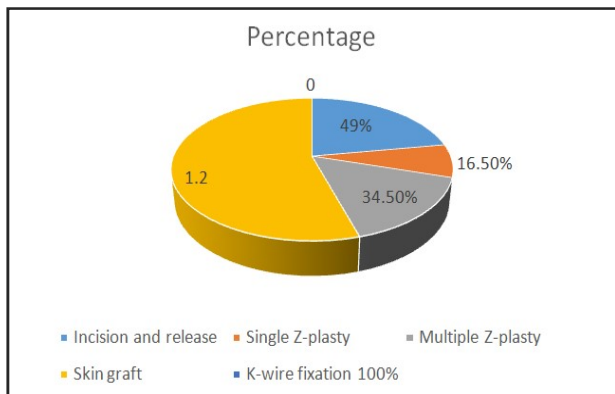


Chart 1. Surgical procedure

Surgical procedure- Out of 55 patients, 27 had contracture released by incision and release; 9 and 19 patients had contractures released by single and multiple Z-plasties, respectively (Chart 1).

According to various meta-analyses, post-burn contracture has a negative outcome that manifests as social isolation, discrimination, societal prejudices, anxiety, and depression.<sup>[6]</sup><sup>[7]</sup> In this study, all patients had anxiety and depression symptoms, which were resolved in the follow-up period primarily by contracture correction and secondarily by counseling.

## CONCLUSION

Burn survivors' mental health is impacted by post-burn hand contracture. As a result, assessing the burn contracture and providing treatment is not enough to resolve the problem. It is necessary to include psychological counselling as part of the rehabilitation programme on a regular basis in order to improve the quality of life. Without quality, there is no value in quantity. Hence, a unified form needs to be developed, particularly for burn patients, that indicates the outcome of health-related quality of life.

### Foot-notes

Conflict of interest: **None**

Funding: **None**

**Declaration:** The diagram of the degree of contracture has been made by Dr.Pooja Pandey using MS Paint .

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