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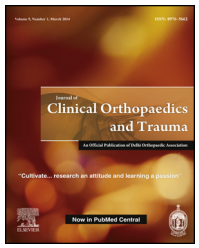

Original Article

Neglected post burns contracture of hand in children: Analysis of contributory socio-cultural factors and the impact of neglect on outcome☆

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ABSTRACT

Background: No study has ever evaluated the causes and effect of neglect on the outcome of post burns contractures of hand in children.
Methods: 66 hands in 61 children (mean age 12.22 years) with a mean neglect of 11.6 years (range 5–17 years) were assessed for the causes of neglect and the outcome of surgery. Average follow up was 6.6 years. The results were assessed in two groups of 5–10 years neglect as group I and >10 years neglect as group II.
Results: In a total number of 134 contracted rays in 66 hands, the surgical procedures included local Z/V-Y flap (51 rays), cross finger flap (48 rays), full thickness graft (35 rays). Additional external fixator with a distracter was used in 3 patients treated at a delay of 14, 16 and 17 years.

50 (81.96%) patients belonged to rural and slum areas. The reasons for delayed treatment included poverty – 33 patients, lack of awareness of surgical treatment – 16 patients; and indifference of parents – 12 patients. 44 (72.13%) children were illiterates. With treatment the average DASH score improved from 65.10 to 36.90 ($p < .000$) and from 68.14 to 45.93 ($p < .000$) in group I and II respectively. The results were significantly superior in group I ($p < .000$).
Conclusion: The main factors for neglect in treatment of post burns contracture include poverty, lack of awareness and illiteracy. All the patients showed significant improvement in function after the surgery. Contractures with higher neglect had significantly inferior outcome.

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1. Introduction

Hand is the commonest site to get inflicted with a burn injury, with children being common victims.[1–6] One of the major determinants of the quality of life in burn survivors is the functionality of the hands.[7,8] These patients are likely to develop various hand deformities and contractures, preventing full hand function.[9,10]

The problems encountered in the treatment of neglected burn contracture include shortage of skin, secondary changes in surrounding tissues like tendons, neurovascular structures, bones and joints and other soft tissues.[11,12] Neglected post-burn contracture is a common problem in the developing countries.[13] There is no scientific data which has tried to assess the causes of neglect in these cases. A number of interplaying factors like poverty, illiteracy, scarcity of specialized surgical centers especially in rural areas, lack of organized health insurance, lack of willingness on the part of the family to seek treatment are likely to act in delaying the appropriate treatment. Knowledge of the role of these factors individually or in combination will help the health care planners to formulate effective strategies for prevention and timely treatment. Furthermore, the effect of delay/neglect in the outcome of surgical treatment has never been investigated.

We present our experience of treating a series of neglected post burn contracture cases in the last 15 years with a focus on the study of socio-cultural factors leading to delay in treatment, and the relationship of neglect/delay in treatment with the functional outcome.

2. Patients and methods

Children with neglected post burn contractures operated from June 1995 to June 2010 were included in the study. Only the patients reporting with a minimum delay of 5 years after the initial burn injury were taken as neglected cases. Patients with burn contracture of less than 5 years duration and with a follow up of less than 2 years were not included in the study. 66 hands in 61 children with post burn contractures fulfilled the inclusion criteria and were included in the series.

At the time of first visit, patient was asked to fill a questionnaire seeking the socio-cultural issues related to the causation and management of the contractures. A clinical photograph of the hand was taken. X-rays (AP and Lateral views) of the affected hand/finger were done in all the cases. Hand function was documented by using a modified DASH score.[14] All the patients were operated under general anesthesia under a tourniquet control. Post operatively a plaster slab was given to all the patients for 2–3 weeks, after which hand physiotherapy was started. At the final follow-up, the hand was photographed and hand function was assessed by using the modified DASH score.

For knowing the effect of quantum of delay in the treatment, the patients were arbitrarily divided into two groups: Group I – patients with a delay in treatment of 5–10 years; and Group II – patients with delay in treatment of >10 years.

Statistical analysis was carried out using SPSS version 19 (SPSS Inc., Chicago, Illinois); statistical significance was set with a p-value of 0.05.

3. Results

There were 31 (50.81%) males and 30 (49.19%) females having average age of 12.22 years (range 7–18 years); 35 children presented between age range of 11–14 years. Right hand was involved in 37 cases while dominant hand was involved in 41 cases. 4 fingers were involved in 6 hands, 3 fingers in 14 hands, 2 fingers in 22 hands, thumb in 7 hands and 1 finger in 17 hands (index finger – 8, middle finger – 3, ring finger – 3, and little finger – 3). 8 patients with electric burns had hypoesthesia. Average duration between burns and surgery was 11.6 years (range 5–17 years). Average age of infliction of burns was 4.5 years (range 1 month–8 years). Mode of burns was: electric burns – 29 cases, fire cracker burns – 17 cases, burns from dry heat (burning coal from earthen ovens) – 10 cases, wet heat (hot water/liquid burns) – 5 cases. Out of total number of 134 contracture of individual rays, local Z/V-Y flap was done in 51 rays, cross finger flap was done in 48 rays and full thickness graft was done in 35 (25 from ulnar border of palm, 8 from upper arm and 2 from inguinal region). Additional external fixator with a distracter was applied in 3 patients; all these patients were in Group 2 and came at 14, 16 and 17 years of delay.

Average follow-up was 6.6 years (range 2–15 years). 37 patients belonged to rural areas. Of the 24 urban patients, 13 came from slum colonies. Initial treatment of burns was taken from a local paramedic/quack by 20 patients, while 41 patients received treatment from local dispensary. The reason for delayed treatment included poverty – 33 patients, lack of awareness of surgical treatment – 16 patients; and indifference of parents – 12 patients. Of 61 children, 7 never went to school and 37 were drop outs.

Average pre-operative modified DASH score in group I was 65.10 and in group II was 68.14. Average post-operative score in group I was 36.90 and in group II was 45.93, with a statistically significant improvement noted in the two groups on paired t-test [t value = 31.364, $p < .000$; t value = 21.172, $p < .000$, respectively]. Also, a comparison of the results in the two groups showed a significantly better improvement in Group I compared to Group II on unpaired t-test [t value = −7.72, $p < .000$]. Photographs of a representative case with good clinical outcome are depicted in Figs. 1 and 2.

Complications included delayed wound healing in 10 rays (all with full thickness graft), problem of hair growth in one ray (with full thickness graft from inguinal region) and Sudeck dystrophy in one patient with external fixator treated at a delay of 17 years. Two patients of electric burns developed partial epiphyseal injury resulting in angular deformity at the proximal interphalangeal (PIP) joint of right little finger in a thirteen years old female (Fig. 3) and bony ankylosis at the distal interphalangeal (DIP) joint of right ring finger in a 14 years old male (Fig. 4). Both the patients, however, did not opt for any corrective surgery for the bony deformities as there was no significant handicap in function.

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