International Surgery Journal
Tyagi A et al. Int Surg J. 2019 Jan;6(1):126-129
http://www.ijsurgery.com
pISSN 2349-3305 | eISSN 2349-2902

DOI: http://dx.doi.org/10.18203/2349-2902.isj20185459

Original Research Article

Clinical profile of patients with post burn contracture

Arnav Tyagi[1], Manu Rajan[2]*, Sanjay Dvivedi[1], Kinnari A. V. Rawat[2]

[1]Department of General Surgery, [2]Department of Plastic Surgery, Himalayan Institute of Medical Sciences, SRHU, Dehradun, Uttarakhand, India

Received: 29 November 2018
Accepted: 11 December 2018

***Correspondence:**
Dr. Manu Rajan,
E-mail: manumanan@rediffmail.com

ABSTRACT

Background: Burns are a major, global public health problem, resulting in an estimated 195,000 deaths annually. Most burns occur in low-and middle-income countries, with almost half occurring in the south-east Asia region. The reasons for the high incidence include widespread ignorance of fire prevention, the rapid increase of poor socio-economic conditions, and the persistence of old traditions and customs.
Methods: The study was carried out in Department of Surgery, Himalayan Institute of Medical Sciences, SRH University, Swami Ram Nagar, Dehradun over a period of 12months. Cases of the post burn contractures attended in the O.P.D were included in the study.
Results: A total of 45 patients were included in the study. Of these, 22 (48.8%) were males and 23 (51.2%) were females. Ages ranged from 1 to 55year. Flame burn (20 cases = 44.4%) was the most common type of initial burn insult followed by scald burns (14 cases=31.1%).
Conclusions: The pitfalls in initial burn care that lead to contractures in the patients include the failure to institute adequate surgical management of deep burns, the lack of physiotherapy/ROM exercises, and failure to provide proper anti-deformity splint age. There is need to revisit the prevalent acute burn care practices and establish focused preventive strategies.

Keywords: Profile, Post burn contracture

INTRODUCTION

Burns are a major, global public health problem, resulting in an estimated 195,000 deaths annually.[1] The majority of burns occur in low-and middle-income countries, with almost half occurring in the south-east Asia region.[2]

The reasons for the high incidence include widespread ignorance of fire prevention, the rapid increase of poor socio-economic conditions, and the persistence of old traditions and customs.[3] Burn related deaths are only part of the problem, for every person who dies as a result of their burns, many more are left with lifelong disabilities and disfigurements.[4]

A burn contracture is an area of skin that has undergone excessive scarring as a result of healing from a deep burn injury. Without splinting or pressure pulling in the opposite direction, such contractures can continue years after the original burn injury.[5] The basic mechanism for the formation of contractures of various aetiologies congenital, acquired or idiopathic is the same. The process is due to the action of the myofibroblast, a cell with fibroblast and smooth muscle characteristics distributed throughout granulation tissue present in wounds.

Contraction of myofibroblasts shrink the wound. This is followed by collagen deposition and cross-linking to

maintain contraction.[6] Once a patient has been resuscitated from burn injuries, efforts are then made to improve wound healing in order to prevent scarring and contractures. Contractures lead to a loss of function, poor cosmetic outcome, reduced quality of life (QOL), pain and psychological consequences.[7]

Failure to seek medical help, inadequate medical care, and inadequate post healing care are common causes of burn contractures.[8] Currently there have been no studies regarding post burn contractures in Uttarakhand and most of the available data is from the western world, therefore this study was conducted to see the clinical profile of patients with post burn contractures in this region.

METHODS

The study was carried out in Department of Surgery, Himalayan Institute of Medical Sciences, SRH University, Swami Ram Nagar, Dehradun over a period of 12months from 1st January 2016 to 31st December 2016. Cases of the post burn contractures attended in the OPD were included in the study after obtaining a written informed consent and ethical clearance.

The study was a descriptive observational study carried out with 45 cases of post burn contractures who presented in the OPD were taken up for the study. The subjects with post burn contractures of either age and sex were included and the patients who refused to give consent are excluded. All the subjects with post burn contractures presenting in the OPD and satisfying the inclusion and exclusion criteria were included for the study.

Informed consent was collected, and following information was collected to generate data for the study.

Demographic and other required general information such as name, age, gender, address, date of admission or discharge and duration of hospital stay.

Relevant detail medical history such as chief complaints in chronological order, mode of injury, time of onset of contracture, site of contracture.

Relevant general and specific medical examination. Details of the subjects in terms of details of site of contractures and subsequent medical evaluations done were recorded.

Data was analyzed by using statistical software SPSS 22. Qualitative variables were represented in form of frequency and percentage. Quantitative data was represented in form of mean±standard deviation.

RESULTS

A total of 45 patients were included in the study in which 22 (48.8%) were males and 23 (51.2%) were females. Ages ranged from 1-55year. There were 15 cases up to the age of 10year (33.3%). 20 (44.4%) cases were in the age ranging from 11-20years. 9 (20%) were in the range of 20-50years and one case (2.22%) was more than 50years. Mean age of the cases was 18.8years (Table 1). Flame burn (20 cases=44.4%) was the most common type of initial burn insult followed by scald burns (14 cases=31.1%), electrical burns in 10 cases (22.2%) and chemical burns in 1 (2.3%) cases (Table 2).

Table 1: Age and Sex wise distribution of cases of post burn contracture.

Age	Number of cases	%
0-10	15	33.33%
10-20	20	44.44%
20-50	9	20%
>50	1	2.22%
Sex		
Male	22	48.88%
Female	23	51.11%

Table 2: Types of initial burn insults which resulted in post burn contracture.

Burn injury	No. of cases (n=45)	%
Flame	20	44.44%
Scald	14	31.1%
Electrical	10	22.22%
Chemical	1	2.22%

Regarding initial management of the burn injury, 28 patients (62.22%) were treated in the primary care centers or local clinic. 14 patients (31.1%) were initially managed in plastic surgery/burn wards at a tertiary care center while 3 (6.6%) received no regular treatment from any hospital and were managed at home by dressings or other remedies (Table 3).

Table 3: Primary place of treatment after the initial burn injury.

Primary place of treatment	No. of cases (n=45)	%
Local doctor/clinic	28	62.22%
Tertiary center	14	31.11%
Home	3	6.6%

In our series, 45 patients had a total of 59 contractures in different areas. The commonest site of contracture in our series was hand 25 cases followed by elbow 12 cases, axilla 7 cases foot 6 cases, 5 cases of neck contractures, 2 cases of face contractures and 2 cases of popliteal contractures were seen. The most common combination of contractures was of hand and elbow followed by axilla and neck (Table 4).

Most of the patients had a history of conservative management which included dressings 28 (62.22%) while 14 (31.1%) had undergone surgical intervention (raw area

grafting) for their deep burns. 3 (6.67%) patients did not show up in any primary or secondary care unit and instead were treated by home remedies (Table 5).

Table 4: Distribution according to site of post burn contracture.

Site of burn injury	No. of cases (n=45)	%
Neck	5	11.11%
Face	2	4.44%
Axilla	7	2.22%
Elbow	12	55.56%
Hand	25	13.33%
Popliteal region	2	4.44%
Foot	6	8.89%

Table 5: Initial burn injury management wise distribution.

Type of initial burn injury management	No. of cases (n=45)	%
Dressing	28	62.22%
Raw area grafting	14	31.11%
Home remedy	3	6.67%

DISCUSSION

In this study, many patients were relatively young. Majority of the patients in this study were below the age of 18years (77.78%). The socio-economic implications of such disabling conditions are even more devastating given the economically productive age of the victims. Study done by Kraemer MD et al, and Suliman MT have described a similar frequent involvement of younger individuals.[9,10]

This age group is known to have the highest incidence of burns, sustained usually at home from hot liquids and from burned woods. Olabanji JK et al, also concluded that 58% of their 76 patients with contractures in Ile Ife, in Nigeria, were children aged 0 to 15years.[11] In this series, there is almost equal involvement of the two genders however in a study conducted by Saaiq M et al, he reported higher frequency of contractures in males than in females. However, Paul AC et al reported equal involvement of the two genders.[12,13]

Flame (44.4%) and scald (31.1%) burns were the commonest underlying type of burn injury in our study. Other studies done by Saaiq M et al, also reported that flame burns injury as the most common underlying type of burn injury among the cases followed by electrical burn injury. In another study done by Balumuka DD et al, flame burns affected 43% of the cases.[12-14] Flame burns most commonly resulted from accidents due to stove burns and wood being used for cooking purposes, due to clothes catching fire in the kitchen, scald burns occurred due to spillage of hot liquid in the kitchen or bathroom. One frequent underlying cause of domestic accidents is the absence of proper cooking gas therefore people are using burning wood for cooking purpose. In our region, a lot of people use wood for cooking. All these causes of flame and scald burns are preventable with simple actions based on government commitment and public awareness.

Primary place of treatment of initial burn injury in our study constituted mostly of local hospitals and clinics which did not have expertise for burn injury and rehabilitation. Almost 62.2 % of the cases were managed in local hospitals where they were treated by non-expertise clinicians. Among the 213 patients included in a study by Saaiq M et al, 92 patients (43.19%) had received their initial burn injury management in general surgery units in tertiary care hospitals compared to 43 patients (20.18%) in district headquarter hospitals. 26 patients (12.20%) were managed in plastic surgery/burn wards, and 52 patients (24.41%) received no regular treatment from any hospital. This shows the lack of knowledge regarding the burn injury management and also reflects the socio-economic status of our society.[12]

In this series, the most common site of post burn contracture was hand (25 cases) followed by elbow (12 cases), axilla (7 cases) and foot (6 cases). Two hundred thirty-nine sites of contracture were released in the study conducted by Iwuagwu FC et al. The study concluded that the most common site of contracture involved the axilla (59 cases) and the hand/wrist (59 cases) followed by the head/neck region (43 cases). In the series reported by Adu EJ et al, a total of 76 contractures were found in 68 patients. 51 (67.11%) of the contractures involved the upper limb, 31 (40.79%) involved the hands, nine (11.89%) involved the elbow, nine (11.89%) involved the axilla, and two (2.63%) involved the wrist." In a contradictory, study done by Saaiq et al, the commonest contracture was of the neck (85 cases), followed by axilla (77 cases), fingers/hand (73 cases), elbow (21 cases), knee (15 cases) and ankle/foot (4 cases). Forty-three patients had more than one contracture.[6,12,15]

In this study, the majority of the patients had a history of conservative management which included dressings while 14 (31.1%) had undergone surgical intervention (raw area grafting) for their deep burns. 3 (6.67%) patients did not show up in any primary or secondary care unit and instead were treated by home remedies. In the study done by Saaiq M et al. The majority of patients (n=197) had a history of conservative management, with only 16 patients (7.51%) having a raw area grafting as a part of their initial burns.[12]

None of the patients had the appropriate anti-deformity splint age in the affected parts or any physiotherapy during the acute phase of their burns. Good positioning of the burned patient is an effective way to prevent contractures. Splinting is used if the patient is not able to voluntarily maintain proper positions.

CONCLUSION

Post-burn contractures are more frequent in young males. Flame burns are the most common reason for burns in these patients. Post burn contractures result when the patients are improperly or inadequately managed after burns. Failure to provide surgical treatment in deep burns, lack of physiotherapy and failure to provide antideformity splint age are the main reasons for post burn contractures. There is a need to reemphasize the proper management of acute burns so that the contractures can be prevented.

ACKNOWLEDGEMENTS

Authors would like to thanks Mr. Manoj Kumar, Mr. Balbeer and OT staff.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Chamania S, Chouhan R, Awasthi A, Sharma A, Sharma P, Agarwal S. Burn rehabilitation: A challenge, our effort. Ind J Burns. 2013;21(1):35-41.
2. Onuba O, Udoidiok E. The problems and prevention of burns in developing countries. Burns. 1987;13(5):382-5.
3. Tejerina C, Reig A, Codina J, Safont J, Mirabet V. Burns in patients over 60years old: epidemiology and mortality. Burns. 1992;18(2):149-52.
4. Gowri S, Naik Vijaya A, Powar R, Honnungar R, Mallapur MD. Epidemiology and outcome of burn injuries. J Ind Acad Forensic Med. 2012;34:312-4.
5. Walsh K, Nikkhah D, Dheansa B. Burn scar contractures and their management. Plastic and Reconstructive Surgery. 2018. https://www.researchgate.net/profile/Dariush_Nikkhah/publication/259177898_Burn_scar_contractures_their_management/links/0046352a22d23a8a11000000.pdf?inViewer=0andpdfJsDownload=0andorigin=publication_detail. Accessed on Aug 15, 2016.
6. Adu EJ. Management of contractures: a five-year experience at komfo anokye teaching hospital in kumasi. Ghana Med J. 2011;45(2):39-43.
7. Egeland B, More S, Buchman SR, Cederna PS. Management of difficult pediatric facial burns: reconstruction of burn-related lower eyelid ectropion and perioral contractures. J Craniofacial Surg. 2008;19(4):960-9.
8. Schwarz RJ. Management of postburn contractures of the upper extremity. J Burn Care Res. 2007;28(2):212-9.
9. Kraemer MD, Jones T, Deitch EA. Burn contractures: incidence, predisposing factors, and results of surgical therapy. J Burn Care Rehabilitation. 1988;9(3):261-5.
10. Suliman MT. Experience with the seven flap-plasty for the release of burns contractures. Burns. 2004;30(4):374-9.
11. Olabanji JK, Oladele AO. Ame oo challenges of postburn contractures in ile-ife. In: Proceedings from West African College of Surgeons 50th Annual Conference; Nigeria; 2010:114.
12. Saaiq M, Zaib S, Ahmad S. The menace of post-burn contractures: a developing country's perspective. Ann Burns Fire Disasters. 2012;25(3):152-61.
13. Paul AC, Swapan KB, Spronk CA, Niemeijer RP, Spauwen PH. Postburn contracture treatment: a healthcare project in Bangladesh. Burns. 2008;34(2):181-4.
14. Balumuka DD, Galiwango GW, Alenyo R. Recurrence of post burn contractures of the elbow and shoulder joints: experience from a ugandan hospital. BMC Surg. 2015;15(1):103.
15. Iwuagwu FC, Wilson D, Bailie F. The use of skin grafts in postburn contracture release: a 10-year review. Plastic Reconstructive Surg. 1999;103(4):1198-204.

Cite this article as: Tyagi A, Rajan M, Dvivedi S, Rawat KAV. Clinical profile of patients with post burn contracture. Int Surg J 2019;6:126-9.