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Skin Grafting in Post Burn Contractures of Groin and Perineum in Patients

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Abstract

Background: Burn scar contractures are severely disfiguring, painful, and itching. As such thing, patients with burn scar contractures which interfere with activities of daily living are often marginalized and experience difficulties in receiving education and securing work. There are a number of therapies to reduce contractures including intra-lesional corticosteroid injection, antihistamines, hydrotherapy, dynamic or static splinting, laser therapy, compression therapy, and surgical excision and reconstruction.**Material and Methods:**This is prospective and single center study conducted in the Department of Surgery at Maheshwara Medical College & Hospital from1st September 2020 to 4th September 2021. All patients were subjected to surgery under general anaesthesia and the following operative procedures were performed: (1) release of contracture with split thickness skin grafting (2) release of contracture and closure by multiple Z-plasties.**Results:**In our study, 72.5% of the patients, post burn contractures of the groin and perineum were because of Open chulla. Other less common causes were hot water (17.5%) and flame burn (10.0%). Majority of the patients were brought with complaints of difficulty in squatting (80.0%) followed by limitation of movements of hip joints (77.5%) and (52.5%) impairment of walking. In our series of 40 patients two types of operative procedures were performed: (1) release of contracture with split thickness skin grafting; (2) release of contracture and closure by multiple Z-plasties. Moreover, 19 (47.5%) patients having bilateral groin contractures underwent release of contracture with split thickness skin grafting. 17 (42.5%) patients underwent release of unilateral groin contracture with split thickness skin grafting and 3 (7.5%) patients underwent release of unilateral groin contracture and closure by multiple Z-plasties.**Conclusion:**Functional outcome was satisfactory in 93.3% patients; their squatting, walking, gait, and movements of the hip joints were improved and patients were able to perform all day to day activities of life and essential that require sitting or squatting position.

Keywords: Groin, Perineum, Skin Grafting, Z-plasties, Post burn contractures.

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Introduction

Burn injury is still the common cause of trauma especially in low- and middle-income countries. Deep partial-thickness and full-thickness burns that are not treated with early excision and grafting can be disabling, as these deep injuries often lead to burn scar contractures unless provided with adequate positioning and splinting.[1] Burn scar contractures are severely disfiguring, painful, and itching. As such thing, patients with burn scar contractures which interfere with activities of daily living are often marginalized and experience difficulties in receiving education and securing work.[2]

There are a number of therapies to reduce contractures including intra-lesional corticosteroid injection, antihistamines, hydrotherapy, dynamic or static splinting, laser therapy,

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compression therapy, and surgical excision and reconstruction; yet, it is still unknown which therapy should be chosen for which contracture, when they should be initiated, and how long should be the period or how often they should be continued.[3]

Generally, contractures arise where adequate burn care has not been applied. Even though scar management has been instigated in a vigorous manner, the contracture may also occur secondary to split-thickness skin grafting to the burn wounds. Another point, the contracture does not only occur due to skin loss but also may result from the differential growth pattern between burn scar and surrounding tissues.[4]

The most powerful treatment option for contracture release is a surgical procedure. The defect should be replaced with the donor tissues matching texture, color, and pliability. Skin flaps including free flaps meet these criteria to replace scar tissues and repair the resulting defect post release, providing superior functional outcomes.[5] Indeed, the gold standard for burn scar reconstruction is to use adjacent skin flaps to minimize differences in skin characteristics. However, achieving a balance between scar resurfacing and minimizing donor site morbidity is a challenging problem that depends on the size of the area involved, the region of involvement, and the availability of the non-scarred tissue for use as skin flaps. Many surgical treatments are available for burn scar contracture release. However, a recent systematic review showed that it is still unclear which surgical procedure is the most effective.[6]

In the management of these contractures, both functional and cosmetic appearances should be the primary concern. Various surgical procedures have been used for the release of these contractures which range from simple release and grafting to a number of different flap procedures.

Material and Methods

This is prospective and descriptive study conducted in the Department of Surgery at Maheshwara Medical College & Hospital from 1st September 2020 to 4th September 2021.

All patients were subjected to surgery under general anaesthesia and the following operative procedures were performed: (1) release of contracture with split thickness skin grafting (2) release of contracture and closure by multiple Z-plasties.

First dressing was seen on third or fourth postoperative day and percentage of graft take/loss was noted. Complications, if any, were recorded. Indwelling urinary catheter drainage was instituted for 3 to 4 days postoperatively. Once the graft stabilized, patients were discharged and advised to wear compression garments. Regular physiotherapy and messaging with emollient creams were advised in all cases to avoid any recurrence of the contracture. Operated patients were followed and the results were analyzed according to the functional and cosmetic outcome; patient's satisfaction regarding the operative procedure and need for any secondary surgeries were recorded.

Results

In [Table 1], maximum number of patients were female 31 (77.5%) and male 9 (22.5%) in present study.

Table 1:Distribution of gender

Gender	Number of patients (Percentage)
Male	9 (22.5%)
Female	31 (77.5%)
Total	40 (100%)

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Table 2: Distribution of different age groups

Age in years	Number of patients (Percentage)
5-10	1 (2.5%)
11-15	13 (32.5%)
16-20	17 (42.5%)
21-25	9 (22.5%)
Total	40 (100%)

In our study, majority of the patients were in the age group of 16–20 years 17 (42.5%) and least were 5-10 years 1 (2.5%).

Table 3: Distribution of causes of patients

Parameters	Number of patients (Percentage)
Open chulla	29 (72.5%)
Hot water	07 (17.5%)
Flame burn	04 (10.0%)
Total	40 (100%)

In [Table 3], in 72.5% of the patients, post burn contractures of the groin and perineum were because of Open chulla. Other less common causes were hot water (17.5%) and flame burn (10.0%).

Table 4: Distribution of complaints of patients

Complaints	Number of patients (Percentage)
Squatting	32 (80.0%)
Limitation of movements of hip joints	31 (77.5%)
Impairment of walking	21 (52.5%)

In [Table 4], majority of the patients were brought with complaints of difficulty in squatting (80.0%) followed by limitation of movements of hip joints (77.5%) and (52.5%) impairment of walking.

Table 5: Operative procedure of patients

Operative procedure	Number of patients (Percentage)
Release of bilateral groin contracture with split thickness skin grafting	19 (47.5%)
Release of unilateral groin contracture with split thickness skin grafting	17 (42.5%)
Release of unilateral groin contracture and closure by multiple Z-plasties	3 (7.5%)
Release of perineal contracture with split thickness skin grafting	2 (5.0%)
Total	40 (100%)

In our series of 40 patients two types of operative procedures were performed: (1) release of contracture with split thickness skin grafting; (2) release of contracture and closure by multiple Z-plasties. Moreover, 19 (47.5%) patients having bilateral groin contractures underwent release of contracture with split thickness skin grafting. 17 (42.5%) patients underwent release of unilateral groin contracture with split thickness skin grafting and 3

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(7.5%) patients underwent release of unilateral groin contracture and closure by multiple Z-plasties. 2 (5.0%) patients with perineal contracture only underwent release of contracture with split thickness skin grafting.

Table 6: Complication had patients

Complications	Number of patients (Percentage)
Postoperative hematoma	2 (5.0%)
Minimal patchy graft loss	1 (2.5%)
Secondary contractures of the graft	2 (5.0%)
Partial recurrence of the contracture	2 (5.0%)
Total	7 (17.5%)

On [Table 6], postoperative hematoma formation under the graft was seen in 2 (5.0%) patients. Minimal patchy graft loss was seen in 1 (2.5%) patients, which was managed conservatively. Minor secondary contractures of the graft were seen in 2 (5.0%) patient. Partial recurrence of the contracture was seen in 2 (5.0%) patients who required secondary surgeries.

Functional outcome was satisfactory in 28 (93.3%) patients; their squatting, walking, gait, and movements of the hip joints were improved and patients were able to perform all day to day activities of life and essential chores that require sitting or squatting position. In 2 (6.6%) patient's functional outcome was not satisfactory.

Discussion

In current study, female genital organs do not suffer severe burns owing to their unique position, whilst men avoid contractures due to the natural suppleness and redundancy of penile and scrotal skin. To put it another way, this enables for more skin to be available to compensate for the loss.

In this study, the manner of injury was never the same as the stated modalities of harm, such as open chulla, flame burns, or hot water burns. Six toddlers received perineal burns as a result of kerosene leaking on their garments from a burning stove or the explosion of such stoves, according to Wani S.[11] An, unique example of burn damage to the vaginal region caused by explosives in a suicide attempt was described by Abdel-Razek SM F et al.[12] In a study of 4,216 patients, Abdel-Razek SM et al. found that hot fluid (55 percent), flame (24 percent), and chemicals (16 percent) caused burns, whereas scalds caused 85 percent of burns in a review of 27 cases by the same authors.[12] In Missouri (USA), Quayle et al. discovered an increase among burn injury rates in African-American girls (0-4 years of age) in counties with a high poverty rate.[14] In a ten-year study of 309 children, Ibrahim A et al. discovered that scalds (72.5%), flames (22.7%), and electric burns (3.2%) were the most prevalent causes of burn injuries.[15] In a separate research of paediatric burn cases conducted in India, scalds were shown to be prevalent in children under the age of six, whereas flame and electric burns were more common in children aged six to fourteen.[16]

The ubiquitous use of wood as a fuel for cooking and heating resulted in a variation in the manner of damage in our patients. The majority of the population lives in villages surrounded by forest in this location, which is situated in the rural region. The bulk of these settlements are situated in remote snow-bound locations with minimal road access, making LPG cylinders unavailable. Although villagers and economically disadvantaged households in India typically utilise kerosene pressure burners for cooking, the chullah is a popular practise in this state. The chullah is commonly utilised for cooking and heating due to its low economic condition, chilly environment, and simple supply of wood. People have a propensity of sitting in front of the chullah's burning wood for warmth, which may result in

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sparks falling on their garments and burn injuries, particularly in the lower body owing to its proximity to the fire.

The use of loose clothing while cooking is the leading cause of burn damage, according to Grishkevich VM, but since the victims in our research were youngsters, family members' irresponsibility seemed to be the reason.[17] This conclusion contradicts Gottileb LJ's findings, which said that children in joint families are less prone to burn damage since they are cared for by adults.[18]

When contractures are released, large raw patches are created. It is preferable to apply a full thickness skin cover over the symphysis pubis during resurfacing since this interrupt the continuity of the skin grafted region. When the abdomen skin is badly damaged, however, this may not be viable. Long-term interventions, such as wearing closely fitting undergarments, must be implemented postoperatively to avoid skin graft contraction, according to El-Maghawry HA.[19] The biggest disadvantage of this treatment is the long-term measure, but in the lack of other options, one must deal with all of the complications connected with split thickness skin transplants.

Because of a lack of knowledge, funding, burns units, and inexperienced personnel, the care of burn patients in the developing world differs from that in the developed world.[20] As a result, progress must be made in these areas, particularly in encouraging people to use LPG stoves, which not only lower the risk of such incidents but also preserve the environment, which is a key concern in this decade. These burn sequelae may be avoided by educating individuals about the need of early medical consultation and good postoperative care and rehabilitation.

Conclusion

The truncal and groin/perineal involvement with disfiguring and functionally restrictive contractures are usually seen in the setting of large surface area burn injuries. The treatment of truncal contractures is largely aimed at mitigating the effects of hypertrophic scarring. In the groin/perineal contractures, the contractures are treated to restore movements that enable the important functions of excretion, squatting, and sexual intercourse. Along with split skin grafting, many innovative local and regional flaps have been described to treat such contractures that provide a durable result.

References

1. Chattopadhyay D, Jash PK, Saraf A, Singh HS, (2015) A Novel Perforator- based Flap for Reconstruction of Post-Burn Groin Contracture. MOJ Clin Med Case Rep 2(5):00039.
2. Thakur JS, Chauhan C, Diwana VK, Chauhan DC, Thakur A. Perineal burn contractures:an experience in tertiary hospital of a Himalayan state. Indian J Plast Surg,2008;41:190-4.
3. Bayram Y, Sahin C, Sever C, Karagoz H, Kulahci Y. Custom-made approach to a patient with post-burn breast deformity. Indian J Plast Surg. 2014;47:127–131
4. El-Otiefy MA, Darwish AM. Post-burn breast deformity: various corrective techniques. Ann Burns Fire Disasters. 2011;24:42–45.
5. Yang JY, Tsai FC, Chana JS. Use of free thin anterolateral thigh flaps combined with cervicoplasty for reconstruction of post burn anterior cervical contractures. Plast Reconstr Surg. 2002;110:39–46.
6. Tsai FC, Mardini S, Chen DJ, Yang JY, Hsieh MS. The classification and treatment algorithm for post-burn cervical contractures reconstructed with free flaps. Burns. 2006;32:626–633.

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7. Woo SH, Seul JG. Optimizing the correction of severe postburn hand deformities by using aggressive contracture releases and fasciocutaneous free-tissue transfers. Plast Reconstr Surg. 2001;107:1–8.6.
8. Stekelenburg CM, Marck RE, Tuinebreijer WE, de Vet HC, Ogawa R, van Zuijlen PP. A systematic review on burn scar contracture treatment: searching for evidence. J Burn Care Res. 2015;36:e153–161.
9. Ahuja RB, Chatterjee P. Comparative efficacy of intralesional verapamil hydrochloride and triamcinolone acetonide in hypertrophic scars and keloids. Burns 2014;40:583-8.
10. Karki D, Mehta N, Narayan RP. Post-burn axillary contracture- A therapeutic challenge. Indian J Plastic Surgery. 2014;47(3)375-380.
11. Wani S, Raashid H. Outcome of split thickness skin grafting and multiple Z-plasties in post-burn contractures of groin and perineum: A 15-year experience. Plast Surg Int 2014;2014
12. Abdel-Razek SM. Isolated chemical burns to the genitalia. Analysis of 12 patients. Ann Burns Fire Disasters 2006;19:148-54
13. Agbenorku P, Aboah K, Akpaloo J, Amankwa R, Farhat B, Turkson E, et al. Epidemiological studies of burn patients in a burn center in Ghana- any clues for prevention. Burns Trauma. 2016;4;21-35.
14. Buriro F, Nizam M, Bux AR. Success and Failures and Problems in the Management of Post Burn Contractures. Semantic Scholar. 2017;23-34.
15. Ibrahim A, Asuku M, Dahiru T. Burn prevention and first aid knowledge- A focus on adolescents in Zaria. Afr J Trauma. 2014:3(1)11-16.
16. Manzoor A, Khan AW, Gania AM, Suhaff AA, Baidya K. Comorbid Psychiatric Disorders in Burn patients- A Tertiary care Hospital Based study. Int J Inform Res Rev. 2016;3(5)2310-2314.
17. Grishkevich VM. Post-burn perineal obliteration: Elimination of perineal, inguinal, and perianal contractures with the groin flap. J Burn Care Res 2010;31:786-90.
18. Gottileb LJ, Grevious MA. Reconstruction of the burned perineum and genitalia. In: Sood R, editor. Burn Surgery: Reconstruction and Rehabilitation. Philadelphia, PA: WB Saunders; 2006. p. 271-91
19. El-Maghawry HA, El Nem W, Sherif N, Hagag SA. An interventional study to decrease healthcare associated burn wound infections in the burn unit of Al Ahrar Hospital in Zagazig city, Sharkia Governorate. Int J Curr Microbiol Appp Sci. 2016;5(3)566-578.
20. Cowan AC, Stegink-Jansen CW. Rehabilitation of hand burn injuries- Current updates. Injury. 2013;44(3)391-396.