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Skin Grafting in Post Burn Contractures of Groin and Perineum in Patients Attending At a Tertiary Care Teaching Hospital

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Abstract: ***Background:*** Burn injuries to the genitalia and perineum are usually the result of a child spilling hot liquid on themselves. Deep perineal burns are usually associated with either large total body surface area (TBSA) flame burns or immersion injury. In the management of these contractures various surgical methods ranging from simple release and split skin grafting and multiple Z plasties. ***Materials and Methods:*** This is prospective and descriptive study conducted in the Department of Surgery at a tertiary care teaching hospital over a period of 6 months after approval of ethical clearance. 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:*** Maximum number of patients were female 23 (76.3%) and male 7 (23.3%) in present study. In 76.6% of the patients, post burn contractures of the groin and perineum were because of Open chulla. Other less common causes were hot water (10.0%). In our study of 30 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, 14 (46.6%) patients having bilateral groin contractures underwent release of contracture with split thickness skin grafting. 13 (43.3%) patients underwent release of unilateral groin contracture with split thickness skin grafting and 2 (6.6%) patients underwent release of unilateral groin contracture and closure by multiple Z-plasties. 1 (3.3%) patients with perineal contracture only underwent release of contracture with split thickness skin grafting. ***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: Post burn contractures, Groin, Perineum, Skin Grafting, Z-plasties.

INTRODUCTION

Burn injuries to the genitalia and perineum are usually the result of a child spilling hot liquid on them. These burns are usually partial-thickness injuries. Deep perineal burns are usually associated with either large total body surface area (TBSA) flame burns or immersion injury [1]. In a review of a decade of experience in a major burn center in United States, found that genital and perineal burns occurred in the context of major burns and were rarely isolated. A total of 64.1% of the burns were caused by hot liquids (scalds), 29.5% were flame burns, 3.8% contact burns, and 2.6% electrical burns [2].

The incidence of perineal burns is uncommon. According to recent reported the incidence of perineal burns to be about 12/1000 admissions way back in the early 90s [3]. In recent times, a study mentioned a fairly consistent incidence of 1–1.5% perineal burn injuries admitted in Hospital [4]. The perineum often escapes burn injury due to its deep location between the thighs. Generally, it is an extrinsic contracture of the surrounding area, that is, the lower part of the abdomen, the inguinal area, and the adjacent thighs that secondarily distort the perineum. It is reported that in the pediatric age group, 56% of patients suffering perineal burns develop contractures needing some form of surgical release, with either local flaps or skin grafts [5].

The mode of injury in developing countries may be different. Children with perineal burns that had been sustained by the spilling of kerosene on the clothes from a burning stove or due to the explosion of such stoves [6]. Perineal burns due to hot water, chemicals, and grease in male secondary to spouse abuse. The

management of perineal burn injuries that were caused by the burning firewood, while cooking in a "chullah" (an earthen floor-level cookstove) [7]. In Kashmir during the winter months for warmth perineal burns caused by "kaangri," or, an indigenous earthen pot containing glowing charcoal, for which it is kept between the legs under a large flowing robe. Moreover, reported accidental chemical (sulfuric acid) burns to the genitalia in 12 patients [8].

Contractures in the groin and perineum lead to problems in squatting, walking, sitting, urination, defecation, and sexual function. Squatting, a common posture adopted in India and Southeast Asia for urination and defecation, becomes extremely difficult and frequently is the chief presenting complaint [9]. Around 25% of all adult patients with burns experience a loss of libido or orgasmic dysfunction. Direct injury to the genitalia increases the number of patients who have sexual dysfunction to a significant higher level [10].

In the management of these contractures various surgical methods ranging from simple release and split skin grafting, multiple Z plasties, 7 flap plasty, incisional release, V to Y plasties and various local flaps like medial thigh flaps, posterior thigh flaps, anteromedial thigh flaps and muscle flaps like the sartorius or gracilis have been used; wide undermining of abdominal skin and advancement to cover the perineal raw area after contracture release has also been described [11].

MATERIALS AND METHODS

This is prospective and descriptive study conducted in the Department of Surgery at a tertiary care teaching hospital over a period of 6 months after approval of ethical clearance.

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 our study, majority of the patients were in the age group of 11–15 years 11 (36.6%) and least were 5-10 years 3 (10%).

Table-1: Distribution of different age groups

Age in years	Number of patients (Percentage)
5-10	3 (10%)
11-15	11 (36.6%)
16-20	9 (30.0%)
21-25	7 (23.3%)
Total	30 (100%)

Table-2: Distribution of gender

Gender	Number of patients (Percentage)
Male	7 (23.3%)
Female	23 (76.6%)
Total	30 (100%)

In table 2, maximum number of patients were female 23 (76.3%) and male 7 (23.3%) in present study.

Table-3: Distribution of region of patients

Gender	Number of patients (Percentage)
Rural	26 (86.6%)
Urban	04 (13.3%)
Total	30 (100%)

In table 3, maximum number of patients 40 (81.63%) were belonged to the rural areas patients.

Table-4: Distribution of causes of patients

Parameters	Number of patients (Percentage)
Open chulla	23 (76.6%)
Hot water	03 (10.0%)
Flame burn	04 (13.3%)
Total	30 (100%)

In table 4, in 76.6% of the patients, post burn contractures of the groin and perineum were because of Open chulla. Other less common causes were hot water (10.0%) and flame burn (13.3%).

Table-5: Distribution of complaints of patients

Complaints	Number of patients (Percentage)
Squatting	25 (83.3%)
Limitation of movements of hip joints	22 (73.3%)
Impairment of walking	17 (63.3%)

In table 5, majority of the patients were brought with complaints of difficulty in squatting (83.3%) followed by limitation of movements of hip joints (73.3%) and (63.3%) impairment of walking.

Table-6: Operative procedure of patients

Operative procedure	Number of patients (Percentage)
Release of bilateral groin contracture with split thickness skin grafting	14 (46.6%)
Release of unilateral groin contracture with split thickness skin grafting	13 (43.3%)
Release of unilateral groin contracture and closure by multiple Z-plasties	2 (6.6%)
Release of perineal contracture with split thickness skin grafting	1 (3.3%)
Total	30 (100%)

In our series of 30 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, 14 (46.6%) patients having bilateral groin contractures underwent release of contracture with split thickness skin grafting 13 (43.3%) patients underwent release of unilateral groin contracture with split thickness skin grafting and 2 (6.6%) patients underwent release of unilateral groin contracture and closure by multiple Z-plasties. 1 (3.3%) patients with perineal contracture only underwent release of contracture with split thickness skin grafting.

Table-7: Complication had patients

Complications	Number of patients (Percentage)
Postoperative hematoma	1 (3.3%)
Minimal patchy graft loss	2 (6.6%)
Secondary contractures of the graft	1 (3.3%)
Partial recurrence of the contracture	2 (6.6%)
Total	6 (20%)

On table 7, postoperative hematoma formation under the graft was seen in 1 (3.3%) patients. Minimal patchy graft loss was seen in 2 (6.6%) patients, which was managed conservatively. Minor secondary contractures of the graft were seen in 1 (3.3%) patient. Partial recurrence of the contracture was seen in 2 (6. 6%) 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

Commonly, patients seek consultation for reconstruction of post burn contractures of the hand, neck, and lower limb. Minor perineal burn contractures which can be unsightly are normally ignored by the patients as they are well hidden by clothes. However, these perineal burn contractures can cause a functional disability. The thick scar bands across the symphysis pubis behind the genitals can bind the thighs together, leading to impairment of the movement of the hip joints, especially abduction. Due to this limitation in movement, walking, sitting, urination, defecation, and sexual intercourse become difficult. Squatting, a common posture adopted in India for urination and defecation, becomes extremely difficult and in fact, this was the main complaint in all our cases.

In our study, females were predominant, female genital organs do not sustain deep burns due to their peculiar location, while males escape these contractures due to the normal laxity and redundancy of penile and scrotal skin. In essence, this allows for excess skin availability to compensate for loss.

In our study, mode of injury in all cases was different from reported modes of injury, i.e., Open chulla, flame burns and hot water burns. Wani S had reported six children with perineal burns that had been sustained by spilling of kerosene on the clothes from a burning stove or due to the explosion of such stoves [11]. Shahida F *et al*. reported an unusual case of burn injury to the genital area by fireworks in a suicide attempt [12]. Abdel-Razek SM *et al*. reported burn injury by hot fluid (55%), flame (24%), and chemicals (16%) in a study of 4,216 patients, while scalds were responsible for 85% burns in a review of 27 cases by the same authors [13]. Quayle *et al*. found increased burn injury rates in African-American girls (0-4 years of age) in counties with a high poverty rate in Missouri (USA) [14]. In a retrospective ten-year study of 309 children, Ibrahim A *et al*. reported scalds (72.5%), flames (22.7%), and electric burns (3.2%) as the most common contributor to burn injuries [15]. In another study done in India on pediatric burn cases, scalds were found to be common in children younger than six years of age while flame and electric burns were predominant in children aged 6-14 years [16].

The difference in the mode of injury in our patients was due to the common use of wood as fuel for cooking and heating. This area is located in the rural region with 95% of the population living in villages surrounded by forest. The majority of these villages are located in far flung snow-bound areas with poor road connectivity, leading to unavailability of Liquid Petroleum Gas (LPG) cylinders. Although kerosene pressure stoves are frequently used by villagers or economically poor families for cooking in India, the use of the chullah is a common practice seen in this state. Due to poor economic status, cold climate, and easy

availability of wood, the chullah is widely used for cooking and heating. People are in the habit of sitting in front of burning wood placed in the chullah for warmth and this can lead to fall of sparks on the clothes and burn injury primarily in the lower body due to its closeness to the fire.

Grishkevich VM revealed that the use of loose clothes during cooking is the major cause for burn injury but as the cases in our study were children, negligence on the part of family members appeared to be the cause [17]. This observation is contradictory to the findings of Gottileb LJ, who reported that children are less prone to burn injury as they are looked after by adults in joint families [18].

Extensive raw areas are produced on release of the contractures. While resurfacing, it is desirable to provide a full thickness skin cover over the symphysis pubis as it breaks the continuity of the skin grafted area. However, this may not be possible when the abdominal skin is deeply scarred. Long-term measures have to be instituted postoperatively to prevent skin graft contraction such as wearing tightly fitting undergarments as reported by El-Maghawry HA [19]. This long-term measure is the main drawback of this technique but one has to contend with all the problems associated with split thickness skin grafts in the absence of alternatives.

As reported by other authors, the management of burn patients in the developing world is different from that in the developed world due to lack of education, funds, burns units, and untrained staff [20]. Hence, improvement has to make in these areas, especially in encouraging people to use LPG stoves, as their use not only reduces the chances of these types of accidents but also conserves the environment, a major issue in this decade. Educating people for early medical consultation and proper postoperative care and rehabilitation can prevent these burn sequalae.

CONCLUSION

The groin and perineal involvement with disfiguring and functionally restrictive contractures are usually seen in the setting of large surface area burn injuries. 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, innovative local and regional flaps have been described to treat such contractures that provide a durable result.

REFERENCES

1. 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.
2. Benito P, Juan, M. Cano. The pudendal thigh flap as VY advanced flap for the release of perineum burn contractures. An Int Jour Surg Reconst.2012; 65:681-683.
3. Chattopadhyay D, Jash PK, Saraf A, Singh HS. A Novel Perforator-Based Flap for Reconstruction of Post-Burn Groin Contracture. MOJ Clin Med Case Rep. 2015;2(5):00039.
4. 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.
5. Eom JS, Sun SH, Hong JP. Use of the upper medial thigh perforator flap (gracilis perforator flap) for lower extremity reconstruction. Plastic and reconstructive surgery. 2011 Feb 1;127(2):731-7.
6. Brewin MP, Lister TS. Prevention or treatment of hypertrophic burn scarring: A review of when and how to treat with the pulsed dye laser. Burns. 2014;40:797-804.
7. Nangole F, Biribwa P, Khainga S. Pedicled anterior lateral thigh flap in managing a bilateral groin contracture. Case Rep Surg. 2014;2014:451356
8. Ahuja RB, Chatterjee P. Comparative efficacy of intralesional verapamil hydrochloride and triamcinolone acetonide in hypertrophic scars and keloids. Burns. 2014;40:583-8.
9. Cowan AC, Stegink-Jansen CW. Rehabilitation of hand burn injuries- Current updates. Injury. 2013;44(3)391-396.
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. 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: 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.