

Case Report

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A Case Report of Degloving Penoscrotal Injury with Anteromedial Thigh Testis Burial and Skin Graft

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Abstract

Degloving injury of penile and scrotal skin are uncommon events and are caused mainly by accidents with industrial machines and agricultural machine belts. Here we report a young male who presented shortly after an farm machinery injury to his genitalia resulting in a degloving injury of his penis and testicles. He was initially managed by debridement and dressing, followed by single staged reconstruction in the form of anteromedial thigh testis burial and skin graft over the penile shaft, which healed with satisfactory aesthetic results with normal voiding function and erection of penis. Literature described different modalities of treating such injuries which is mainly done through a multidisciplinary approach which wasn't available at our setting.

Keywords: Penile; Scrotal; Anteromedial thigh; Degloving Injuries

Introduction

Genital injuries occur mainly due to harvesting machines in agriculture field, industrial machines such as pulleys, chains and rotary discs. When they catch the operators clothes and pull out the skin of the genitalia. Such lesions, although not life-threatening they are incapacitating and have a devastating psychological impact as well as challenging for first responders and surgeon because of the skin loss involved [1]. Scrotal, penile, and perineal skin loss may follow severe infections like Fournier's gangrene or it may be traumatic by crush injuries or avulsion by industrial or agriculture machines [1]. Less than 50 percent of the scrotal skin loss can often be closed primarily without difficulties immediately after trauma, with the remaining surrounding tissue. Extensive scrotal wounds with exposed testes represent challenging problems to the reconstructive surgeons, this is related to the fact that restoration of a durable functional cover of the testes and shape of scrotum is of paramount importance for physiological, social and psychological reasons, especially in young males. Spectrum of surgical options has been used for closure of major scrotal wounds.

Case Report

A 28 years old farm worker sustained a degloving injury to his genitalia when his clothes were caught in a harvesting machine pulley. He arrived to the hospital approximately 4 hours after the trauma. At emergency department he was awake, haemodynamically stable with a degloving injury involving the whole shaft of the penis and the scrotum which was heavily contaminated with dirt and machinery grease (Figure 1). He received the initial management at a peripheral health centre including tetanus toxoid, analgesia, intravenous fluids, light dressing and intravenous antibiotics by the referring doctor. Careful debridement and removal of dirt was done under general anaesthesia, which allow assessment of the extent of penile damage and confirms the viability of the testicles. It reveals total avulsion of scrotal skin and penile skin except skin sparing the distal part of penile shaft. Blood investigations, urine analysis, complete blood count, coagulation profile and renal function tests revealed no abnormality. Swab was taken for culture and sensitivity and the patient subjected to regular dressing and continued on injectable cefoperazone until it was clean, healthy with no growth on culture. Imaging studies were done and USG studies shows testicles viable and penile shaft normal. Patient advised for the staged operation fascio-cutaneous flaps and reconstruction, but patient reluctant for staged procedure due to psychological impact

due to injury. Patient needed the single staged treatment rather than staged procedures due to prolonged exposure and repeated surgeries which he considered to have emotional impact on himself. Thus we suggested suprapubic burial of testicles and skin graft, anteromedial thigh burial and skin grafting, short staged scrotal reconstruction and graft. At last patient willing for anteromedial burial of testicles and skin graft in a single staged procedure (Figures 2 and 3). Five days later, the patient was taken to the theatre after being consented for a single staged operation under spinal anaesthesia in which the anteromedial region of both right and left thigh pouches are created subcutaneously and respective testicle burial done with ease without rotation in there axis. Later, the penile shaft is slightly scooped and the split skin graft harvested from thigh and kept over the penile shaft. Five days later the dressing changed, penile graft was viable and completely accepted (Figure 4). The testicles in the antero medial thigh appears normal after USG scan the vascularity of the testicles was normal. The patient was



Figure 1: Degloving injury of penoscrotum

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Figure 2: Operative finding of graft and thigh burial



Figure 3: Operative finding of Graft and thigh burial



Figure 4: Post operative day 5

discharged after 8 days with clean wound.

Two weeks later, the graft was completely accepted and patient was comfortable with buried testis and the skin graft over the penile shaft. Two months later, the patient has satisfactory healing (Figures 5 and 6). He had no complaints about the size, shape, sensation or erection of penis. Thus he is psychologically happy and the penile erection is slowly attaining the pre injury size by regular masturbation. He was advised for psychiatric consultation regarding the post traumatic mental status after 3 months. Psychiatric results showed that he was happy with outcome of procedure, size of penile erection and position of testis in thigh.

Discussion

Traumatic penile and scrotal injury can result through multiple mechanisms, including infection, burns, human or animal bites, and degloving injuries that involve farm and industry machinery. Generally, injuries damage only the skin, causing minimal bleeding without producing damage to the cavernous body, the spongy body or the testes [1-3]. The corpora, by definition, are not involved [4]. Avulsions may vary from simple lacerations to virtual emasculations [3]. It requires

careful selection of which tissue to debride, as well as proper selection of grafts and flaps for reconstruction, aiming to achieve a satisfactory aesthetic result, normal voiding and re-established sexual function. The penis is particularly susceptible to avulsion injuries. The overlying skin of the penis is loose and elastic. The penile skin must be highly mobile to accommodate both the rigid and flaccid state of the penis. This loose base predisposes the skin to be ripped off easily from the penis [3].

The natural cleavage plane along the shaft of the penis is between the Buck's fascia and the loose areolar tissue that surrounds it. The avulsed segment of the skin from the penis includes the loose areolar tissue with its subcutaneous veins, the Dartos fascia, and the skin as a unit. Because the Buck's fascia is preserved, the corpora cavernosa and corpus spongiosum, including the urethra, are spared, as are the deep dorsal vein and dorsal artery, and nerve. Surgical repair of soft tissue loss to the penis should be undertaken quickly. Prolonged exposure of the denuded penis increases the risk of secondary infection as well as significantly compromise the vascularity. Scrotal skin avulsion is especially difficult to repair. The skin of the scrotum is extremely loose, and the deeper layers contain the Dartos, which is a thin layer of smooth muscle fibers. Beneath the Dartos lie the intercolumnar fascia and the cremasteric fascia and muscle, which are important for thermoregulation of the testicles to maintain adequate spermatogenesis [5]. It is therefore important that the testicles be replaced as close to their original location as possible. Testicular sparing is the rule with this injury, and the cremasteric reflex has been implicated as a cause [5].

In traditional treatment, after cleaning and debridement of devitalised tissues, the exposed tissues are covered with viable flaps from the remaining skin. Staged reconstruction has a better functional outcome, a sensate and hair-bearing scrotum, and more reliable coverage without the problems of graft take and graft contracture which may cause painful erection. However some staged operations like that described by Luiz et al. [6] which extend to 7 months may have emotional impact on the patient which we aim to minimize without jeopardizing the satisfactory outcome. When there is no available skin, penile burial in the scrotum or in the suprapubic region is performed. Other techniques, such as banking of the testicles in the inner thighs or reconstruction of the scrotum by tissue expansion, as described by Still and Goodman [7], are also applicable. The combination of the flap



Figure 5: Post graft and testicle thigh burial after 2 months



Figure 6: Post graft and testicle thigh burial after 2 months

and split skin graft described by Sengathir [8] may have given a better scrotal contour and less curvature. No standard approach is used to treat soft tissue injuries to the penis, as the mechanism of injury is quite varied. Individualised approaches should be used for each patient [4]. Although the procedure we describe here does include skin grafting which is often needed in major avulsions, we ended with skin grafting and inner thigh burial with satisfactory results. It can be done by general surgeon also when no special facilities at district hospitals to save the valuable time and avoid infection. However, Michael Ward [9] highlighted the role of multidisciplinary approach, with urology and plastic teams. To offer the highest level of surgical care for patients with polytraumatic injury, including significant genital trauma: penile degloving, bilateral testicular avulsion and bilateral spermatic cord laceration. There is an increasing role in recognizing potential quality of life issues beyond the scope of a trauma or general surgeon to spare reproductive and endocrine difficulties later in life.

Conclusion

Staged reconstruction or flaps with skin grafts are the main modalities described for treating such lesions in literature; however, we preferred to use a simple single staged reconstruction tailored to the situation and making best utilisation of available facilities in our settings and ending with a good result and psychological benefit. Moreover it can be done by general surgeons at any district hospital or general hospital away from optimal setting. We recommend that these types of injuries should be referred to specialized hospital at which the

reconstruction can be carried out by multidisciplinary team. However, in remote areas where patients are not affordable for specialised treatment, in that settings we preferred to use a simple single staged reconstruction tailored by a general surgeon with good understanding of the principles of the described operation might be suitable solution.

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