Review of degloving injury of scrotum and penis and presenting a case of complete degloving injury with single stage treatment

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Abstract

Scrotum and penis can be injured by degloving or penetrating injuries. Degloving injuries look devastating but are generally free of infection and heal with satisfying results. Review of literature revealed single stage for partial and staged procedures for the treatment of complete avulsion of penis and scrotum. A case of complete avulsion of penis and scrotum has been presented as it has been treated with a single staged procedure with excellent results.

Introduction

Scrotum and penis can be injured by degloving or penetrating injuries. Degloving injury is an extensive superficial injury. Testes, corpus cavernosum, bulbous spongiosum and urethra are spared. There is minor contact with object which hooks and physically rips off the skin. It is therefore generally free of infection. Penis caught in pant zipper or paddy field rotating machinery.

In penetrating injury, testes, corpus cavernosum, bulbous spongiosum or urethra may be damaged. There is a greater contact with the offending substance and is prone to infection. Road traffic accidents, gunshot injuries and mutilating amputations are a few examples.

The management of injury to the penis & scrotum is as conservative as possible. It involves hemorrhage control, minimal debridement, and early repair. The management differs according to the site and extent of injury. Buck’s fascia disruption is managed with suturing. The penis is placed in a scrotal tunnel if there is extensive loss of penile skin and a plastic repair is performed later. The penis can also be buried in the suprapubic region. Penetrating scrotal injuries require exploration. Partial scrotal avulsions require primary closure in 2 layers with absorbable 3-0. For attempting primary closure, the injury should be less than 8 hours old. The testes can be placed in protective pockets in the medial thigh in complete scrotal avulsion and penrose drain is inserted. The exposed tissues are covered with viable flaps from the remaining skin. Posterior scrotal skin is stretched to cover the defect and any subsequent defect is skin-grafted anteriorly. Reconstruction of the scrotum can be done by tissue expansion.

Literature Review

On reviewing the literature by using the key words of degloving injury, penis and scrotum, there were only a few case reports. There was penile avulsion in an eight years old boy due to dog bite. Penile coverage was gained by use of the avulsed skin flap itself, without a graft or local tissue flap. A neoprepuce was constructed using the redundant skin. A 2 7 years old farmer had a complete avulsion of penile and scrotal skin by a paddy harvesting machine. It was managed by a split skin graft and two staged hypogastric flap. A three step procedure was performed to treat a case of scrotal skin avulsion. As a first step, the penis was covered with remnant scrotal and prepuce skin and the testes were placed in thigh pouches. Thigh flaps were planned as the second step and finally scrotal reconstruction with thigh pedicle flaps was done. A case of complete unraveling of the penile skin and partial avulsion of the scrotal skin, was treated less aggressively without the need for a skin graft. A patient with total degloving of penis, scrotum and perineum was treated with a multistage surgery. The first stage involved implantation of the penis under the skin of the hypogastrium and implantation of the testes under the skin of the thighs. In the second stage, the penis was covered with the hypogastric skin and the penis was freed. Then the scrotum was formed from a pedunculated skin flap of the thigh and the testes were displaced therein. Then as a fourth step, a plasty of the penile skin, excision of extensive scar and bilateral orchidopexy were performed. After a 25 years’ experience in the operative procedure, the principles of surgery suggested are to keep tissues moist, debride the wound thoroughly and catheterise with a Foley catheter. Stay stitches are taken at the level of the corona to form a small "cuff" or "sewing ring." A split-thickness skin graft is taken at 13/1000 of an inch from the adjacent medial thigh is meshed but not
expanded. It is sutured using fine gut sutures. The posterior scrotal remnant skin is stretched over the testicles and skin graft is fixed anteriorly as necessary. Dressings are taken out at 5 days. There is a Preliminary Report on Scrotal Reconstruction Using Rapid Intra-operative Tissue Expansion. Residual cutaneous scrotal and medial anterior thigh flaps are dissected bilaterally. A round 300cc tissue expander is positioned and overlying skin is loosely approximated with Allis clamps. Expanders are gradually inflated for 5 minutes, closely monitoring scrotal skin color. This cycle is repeated 4 times with 2-minute rest intervals between expansions. Layered midline closure of the stretched scrotal skin and dartos fascia is completed using interrupted polyglactin sutures. The American Association for the Surgery Trauma Organ Injury Scales grading for male external genital trauma readily characterizes patients with high grade injuries that require operative management as well as select patients in whom injury can be safely managed nonoperatively. According to Urological Clinics of North America, most lacerations of the genital skin can be closed primarily. Testicular transplantation into subcutaneous thigh pouches is not frequently required for traumatic injuries to the scrotum. It can be a temporizing or permanent measure, however, dependent on patient age, sexual function, and overall prioritization of trauma injuries. One case report in 1957 explains a primary one stage surgery without thigh pouch for complete avulsion of skin of penis and scrotum, but the full text is not available to know the procedure performed.

Case Presentation

A 37 years farmer had his clothing accidentally caught in a harvesting machine which pulled out the skin on the genitalia completely (Fig 1). He did not suffer from any co – morbidities and had completed his family. His general examination was unremarkable. On examination, there was complete avulsion of penile skin extending to lower abdomen and complete avulsion of scrotal skin extending as a perineal vertical midline tear not involving anal sphincter (Fig 2). The patient presented within six hours of injury. The patient was managed with a single stage operation. Penis was covered with a primary thick split thickness graft after catheterization. Pouches were created on medial side of thighs and testes were implanted bilaterally. The laceration extending to lower abdomen was primarily sutured. The midline vertical perineal wound was primarily sutured over a suction drain which was removed on the third post-operative day. The penile shaft graft dressing was changed on post-operative days 4, 6, 8 and sutures were removed on day 10. The outcome was good. There was good urinary flow, good sexual function and good cosmesis (Fig 3 & 4). There were added advantages of a one-step procedure with early return to normal lifestyle without any psychological problems.

Discussion

Degloving injury generally presents as an emergency and requires early reconstructive surgery within the first few hours for good outcomes. The initially appearance is devastating to the patient and perplexing to the novice. Generally partial degloving is treated as a single stage procedure. Complete avulsions are generally treated with a staged procedure involving two, three or even four stages. The present case of complete avulsion of penis and scrotum has been treated with a single staged procedure. The treatment technique involved is simple. A thick split skin graft is easy to harvest and is used to cover the entire penis. A pouch is created in the medial side of the upper thighs without much difficulty and testes are lodged within it without compromising their blood supply. A general surgeon can easily perform this surgery and achieve satisfying results with confidence.

References

Illustrations

Illustration 1

Degloving injury single stage treatment - final outcome
Illustration 2

Illustrations after injury and after 1 month
Appearance on Admission
Appearance after 1 month