

UROGENITAL TRAUMA

Penetrating external genital trauma: a 30-year single institution experience

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Purpose: We examine the characteristics, outcomes and incidence of penetrating external genital trauma at our level I trauma center.

Materials and Methods: Patient records entered into our urological trauma registry were reviewed from 1977 to August 2006.

Results: A total of 110 patients sustained penetrating external genital trauma. Injuries were divided into gunshot wounds (49%), stab wounds/lacerations (44%) and bites (7%). Half of the stab wounds/lacerations were self-emasculation injuries. Operative exploration was performed in 78%, 63% and 75% of gunshot wounds, stab wounds/lacerations and bite injuries, respectively. Of 6 patients with complete penile amputations 5 underwent replantation with an 80% success rate. Testicular injury occurred in 39% and 27% of patients with gunshot wounds and stab wounds/lacerations, respectively. Of the 24 testicles injured via gunshot wounds 18 were reconstructed (75%). Testicular salvage rates were 24% (4 of 17) for self-emasculation stab wounds and 20% (1 of 5) for all other stab wounds/lacerations injuries. Of patients with penetrating external genital trauma 11% also had associated urethral injuries. The incidence of penetrating external genital trauma has remained stable during the last 30 years ($r(2) = 0.98$). Of patients treated with operative exploration 8% and of those treated nonoperatively 4% reported complications.

Conclusions: Conservative débridement of penetrating injuries to the external genitalia should be stressed to maximize tissue preservation. Testicular salvage rates are significantly higher in gunshot wound injuries (75%) compared to stab wounds/lacerations injuries (23%) ($p < 0.001$). A select group of patients with penile and scrotal injuries (ie those with injuries superficial to Buck's or dartos fascia) may undergo nonsurgical treatment of the penetrating external genital injury with minimal morbidity.

Evaluation and management of gunshot wounds of the penis: 20-year experience at an urban trauma center

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Background: Although gunshot injuries to the penis occur relatively infrequently in patients with penetrating trauma, they often present dilemmas of subsequent evaluation and management. We review our extensive experience with gunshot wounds to the penis at a high volume urban trauma center.

Methods: The urologic trauma database was retrospectively reviewed to extract and compile information from the records of 63 patients treated for gunshot wounds to the penis. Data were accumulated for a 20-year period from 1985 to 2004 with regard to findings on physical examination, diagnostic evaluation, associated injuries, management, and outcome. We detail our technique of penile exploration and artificial erection in the management of these injuries.

Results: Penile gunshot wounds were associated with additional injuries in 53 of 63 (84%) patients. A total of 48 (76%) patients were taken to the operating room and 44 (70%) penile explorations were performed. Evaluation included retrograde urethrogram in 50 of 63 (79%) patients and was diagnostic for urethral injury in 11 of 12 (92%) cases. Primary urethral repair was performed in 8 of 12 (67%) patients with urethral injury versus 4 of 12 (33%) who underwent urinary diversion by means of suprapubic cystostomy.

Conclusions: Evaluation and management of gunshot wounds to the penis may potentially be complex. Retrograde urethrogram should be performed in all cases except the most insignificant and superficial wounds. We describe our technique of penile exploration and artificial erection, noting excellent results in patients for whom follow-up is available. Additional studies are needed to prospectively evaluate techniques for management of gunshot urethral injuries.

Editorial Comment

The above two articles are from major trauma centers in the US, from San Francisco and Philadelphia. The San Francisco paper is unique in that the 30 year experience is the cumulative experience of one surgeon (an authority in the field) over the course of his career. This continuity and consistency of care, strengthens the conclusions of this paper.

Overall, both papers illustrate that penetrating genital injuries occur uncommonly – even in major trauma centers, only 3 or so cases per year. Such rare events, further values the conclusions and cumulative experience of papers over such long study period. Aside from evaluating the injury to the genitals, all patients need to be evaluated according to AAST trauma protocols, including routine radiographs of the chest and abdomen, with entrance and exit wounds marked with radio-opaque markers. General surgical principles for managing penetrating injuries apply well to external genitalia trauma, except for wounds of the corpora cavernosum and spongiosum, which should be treated like vasculature, with limited debridement and good hemostatic closure, except repaired with absorbable suture material. General management consists of meticulous hemostasis, vigorous saline lavage, removal of foreign bodies, hematoma evacuation, conservative debridement of devitalized tissue, repair of associated injuries, and primary wound closure. Infection is rare in properly debrided wounds.

Penetrating injuries to the penis (deep to Buck's fascia) demand evaluation for associated urethral injury by either retrograde urethrography or cystoscopy. Surgical exploration should be performed in all cases except with the most insignificant and superficial wound. Blood at the meatus or gross hematuria highly suggests a urethral injury and warrant evaluation. Corporal injuries should be repaired primarily with absorbable sutures. Low velocity penetrating urethral injuries should be repaired primarily – typically by an anastomotic urethroplasty. Primary realignment for such urethral injuries often results in high urethral strictures rates. Staged urethral injury repair is often reserved for extensive injuries – as is often seen in high velocity gunshot wound tissue injuries. Patients with injuries to the scrotum deep to Dartos fascia or with scrotal swelling also warrant exploration. Penetrating wounds to the scrotum damage a testis or cord roughly half the time. Once the testis is struck, the chance to salvage the testis after a low velocity GSW is 25 -50%. This contrasts sharply for high velocity injuries of the battlefield, where salvage is rare. Scrotal stab wounds seem to more commonly involve the vascular cord, and thus explaining the reported poor salvage rate.

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