Fracture of the penis, or rupture of the corpus cavernosum is an uncommon injury, but probably under-reported entity. Only approximately 180 cases have been reported in the literature. Penile fracture with urethral injury is even more uncommon, accounting for approximately 10 to 20% of the cases reported. Early reports on this injury suggest conservative therapy as the choice of treatment. Recent reports emphasize immediate surgical repair to prevent late sequelae of injury, especially those associated with urethral rupture. We review 5 cases with evaluation, treatment and followup. Delays in treatment lead to long-term complications.

Key words: corpus cavernosum, traumatic rupture, management

INTRODUCTION

Traumatic rupture of the corpus cavernosum occurs relatively rarely. To date, while 180 cases have been described in the literature, its exact incidence is impossible to ascertain, since many cases probably remain unreported. However, the condition represents a surgical emergency, and practicing urologists should be familiar with its evaluation and management.

Typically, patients present with gross distortion of the penis, swelling and widespread ecchymosis involving the shaft of the penis, extending occasionally to the scrotum and/or abdominal wall.

Evaluation and management of traumatic corpora cavernosal rupture have been an area of controversy. We present 5 cases with followup that illustrate the spectrum and the results of various forms of management.

We give guidelines for the evaluation and management of penile fracture in light of our experience and of current literature.

CASE REPORTS

Case 1. A 18-year-old man, awoke with the sudden onset of penile pain accompanied by rapid, progressive penile and then scrotal swelling. The patient denied trauma or sexual activity but may have rolled over in bed while asleep and bent the erect penis in an unphysiological manner. All laboratory studies were normal. The patient was able to void spontaneously. He was initially hospitalized and treated conservatively with ice to the genitalia, parenteral antibiotics and bed rest. After 7 days little clinical improvement was apparent and he was transferred to our hospital where physical examination revealed diffuse swelling of the shaft, and a large hematoma involving the penis and two-thirds of the scrotum. The penis was deviated to the right side, and its base was indurated and tender. Ultrasonographic examination of the penis revealed a large penile hematoma and a defect in the tunica albuginea of the left corpus cavernosum. Degloving of the penis revealed a 2 cm laceration on the left corpus cavernosum. The hematoma was evacuated and the defect in the tunica albuginea was closed with interrupted polyglycol sutures. Convalescence was uneventful and he was discharged from the hospital 9 days later. At 6 months he reported normal erections and no voiding symptoms.

Case 2. A 55-year-old man, experienced a sharp pain accompanied by an audible snap during intercourse followed by detumescence and moderate penile swelling. The pain subsided and the patient did not seek medical treatment. However, during the next erection there was a marked bend of the penis to the left side. He presented to the hospital 3 months later complaining of a severe bend of the penis during erection, which precluded intercourse. On physical examination a fibrotic area over the dorsal aspect of the left corporeal body was noted. Prostaglandin E1-induced erection displayed a 80-degree curve of the penis to the left side.
At exploration a fibrotic area in the left tunica albuginea was excised. The defect was closed with a tunica vaginalis graft. Convalescence was uneventful and 1 year later the patient reported normal tunescence and rigidity.

Case 3. M.D., a 44-year-old man, also reported trauma during vigorous intercourse. He was evaluated at a local hospital where diffuse swelling and ecchymosis of the penis were noted. The patient was treated with ice applied to the penis and penile swelling decreased. He finally sought the help of a urologist 3 weeks later due to persistent swelling and tenderness localized to the dorsolateral aspect of the base of the penis.

Ultrasound revealed a hematoma at the base of the penis but no tear in the tunica albuginea could be identified. The penis was degloved and an organized hematoma was evacuated from the base of the penis. A 3 x 2 cm tunica albuginea defect. A polytetra-flurooethylene (Gore-Tex) patch was sewn into place. Postoperatively, the patient did well and he reported straight erections at 6 months postoperatively.

Case 4. R.P., a 26-year-old man, while engaging in vigorous sexual intercourse, hit the penis forcefully against the partner's perineum. He experienced immediate detumescence accompanied by pain. Diffuse swelling of the penis ensued. A swollen, echymotic penis with curvature to the left side was noted.

Diffuse tenderness could be elicited. The patient denied any voiding difficulties. A corpus cavernosogram was done, which revealed a large tear in the right corpus cavernosum with extravasation of cont-раст material in the subcutaneous tissues. At exploration the penis was degloved and a 3 cm tear in the tunica albuginea was observed. The edges of the tunica were debrided and reaproximated with interrupted sutures of 3-zero polyglactin. Convalescence was uneventful and the patient was discharged from the hospital on 10 days postoperatively. He resumed sexual activity at 6 weeks postoperatively and at 8 months he reported normal erections with only a slight curvature to the right side.

Case 5. P.S., a 23-year-old man presented to the emergency department with a gunshot wound through the penis and thigh. On the physical examination there was a bullet entry wound on the right side of the penis with an exit site along the inner aspect of the left scrotum. The penis was echymotic and tender. Urinalysis was positive for blood although the patient was able to urinate easily. A retrograde urethrogram failed to demonstrate any urethral injury.

A cavernosogram demonstrated extravasation of contrast material out of the left corpus cavernosum. After the penis was degloved a hematoma was evacuated, and the entrance and exit points of the bullet were identified in the right corpus cavernosum. These areas were debrided and closed with 3-zero polyglactin running sutures.

The patient was discharged from the hospital 10 days later. A week later he reported normal erections. At 10 months he was doing well with straight erections, and normal sexual activity and sensation.

**DISCUSSION**

In the flaccid state the penis rarely is prone to injury except in rare cases, such as avulsion injuries or self-mutilation. However, during erection fracture of the penis may occur. The mechanism of injury is usually either direct trauma to the erect penis, forceful bending of the penis in an unphysiological manner or penetrating injuries.

Patients present with a classical history. The penis undergoes direct external force by either vigorous intercourse, bending while erect or blunt trauma.1. The patient may
harm a crack or snapping sound and experiences immediate detumescence with abnormal swelling of the penis, usually accompanied by discoloration and deformity. The penis will angulate away from the site of injury to the corpus. Pain may be mild to severe. Voiding symptoms are present if the urethra is injured or if the hematoma actually compresses the urethra causing a decreased urinary stream. Urinary retention also may occur. Gross hematuria or blood at the meatus usually indicates urethral injury but is not pathognomonic.2,5

The tunica albuginea thins during erection from a thickness of 2 mm in the flaccid penis to approximately 0.5 mm in the erect state.3 Despite the fact that it is considered one of the strongest fascial layers in the human body, it can rupture when placed under direct external force. Rupture of the tunica leads to extravasation of blood from the erectile tissue of the corpus cavernosum. Blood dissects under Buck's fascia, and a hematoma may extend into the scrotum and/or abdominal wall if this fascial layer ruptures.4 In about a third of the cases the urethra may be injured, either lacerated or completely transected.5 The ease of the urethral injury is believed to be excessive stretch in a ventral-dorsal direction.7

Most patients will present immediately after the injury, while some will delay treatment. At physical examination features of penile fracture are easily recognized. Occasionally, a defect in the tunica albuginea may be palpable. However, a careful history should help to ascertain the nature of the injury. Evaluation of the urethra should include a retrograde urethrogram to determine the presence of a urethral injury, its location and extent.6 Patients with a normal urinalysis did not exhibit any urethral injuries.6,10,16

In addition to the history and physical examination corpus cavernosography will provide further information. Cavernosography will confirm corporeal rupture and should help to determine the location and extent of the injury, which will aid in planning surgical management. A nonoperative approach should be taken only if there is no evidence of corporeal injury. Recently, ultrasonic evaluation has been used to identify corporeal rupture.11,12

Treatment of traumatic rupture of the corpora may be nonoperative or operative. Nonoperative treatment consists of compression dressing, penile splinting, ice packs, sedation and various degradative enzymes, such as trypsin or streptokinase-7. Antibiotics, nonsteroidal anti-inflammatory agents and various drugs used to suppress erections (diethylstilbestrol, amyl nitrate and diazepam)14,14,7 have been prescribed. However, this form of treatment has been found at at followup to be less satisfactory than surgical repair of the injury. Length of hospitalization was longer, recovery of erectile function was slower and a number of patients experienced complications (persistent penile curvature).17 In our patients 2 of the 3 patients who delayed surgical treatment had persistent pain and swelling, and 1 had significant penile curvature. Other complications include penile abscess.8

Surgical management of corporeal rupture has been advocated by most investigators.1,7 We recommend early surgical therapy, since a delay in exploration and repair of the tunica defect may lead to the complications associated with nonoperative repair. Principles of surgical management are circumferential degloving incision, evacuation of the hematoma, identification of the injury, debridement and repair of the corporeal injury. If the tunica defect is large and cannot be closed primarily a patch graft should be used. Several options are available, including tunica vaginalis, a polytetrafluoroethylene graft or dermal graft. A drain may be left in place to prevent hematoma formation postoperatively. Overall, good results have been noted on followup.

For patients who present with concomitant urethral injury (22 to 33%), urethroplasty or urinary diversion may be considered, depending on the extent of the injury. For complete disruption the urethra may be reanastomosed over an indwelling catheter. When the tear in the urethra is small McAninch recommended temporary diversion by suprapubic catheterization.8,13

Long-term complications include erectile dysfunction and persistent penile curvature, which, if severe, can be effectively managed surgically. Urethral injury also may lead to stricture formation. Therefore, followup is important to identify and treat any of the possible late postoperative complications.10,14

CONCLUSIONS

Appropriate evaluation of penile fracture may include a retrograde urethrogram if urethral injury is suspected, and a corpus cavernosogram to determine the location and extent of the corporeal injury. Early surgical intervention is recommended with evacuation of the hematoma, primary repair of the corporeal defect and repair of any concomitant urethral injury. Surgical management is preferred to conservative management since it is associated with a shorter hospital stay, more rapid return of normal sexual function and a decreased incidence of long-term complication.

SUMMARY


Ključne reči: corpus cavernosum, traumatska ruptura, tretman
REFERENCE