Penile Fracture Diagnosis and Management- A North Indian Tertiary Care Experience

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ABSTRACT

BACKGROUND

Fracture of penis is an uncommon injury encountered in urology practice. We describe our management and follow up of patients over 4 years of our practice in north Indian tertiary care center.

METHODS

It was a retrospective cohort study from a single center including 17 patients over 4 years 2014-2018. Patient's records were analysed for the mode of injury, examination finding, investigations i.e. ultrasound, MRI, details of the surgery, short and long term follow up. The difference in complications was analysed with the Fischer exact test (Qualitative) and Mann-Whitney test (Quantitative).

RESULTS

We managed 17 patients of which 13 were operated and 4 were conservatively managed. The average age ranged from 22-60 years (average 39.67). Sixteen patients were married, and one patient was unmarried. The mechanism of injury was sexual intercourse in 16 men and trauma due to masturbation in 1 patient. The fracture was palpable in 12 patients (70.6%); four patients had large penile swelling, and 1 patient had mild swelling which was found to have dorsal vein injury later on. On exploration, urethral injury was found in 2 patients. The mean duration between injury and surgery was 19.84 hrs. Postoperatively swelling subsided in 3-5 days in 12 patients and one patient in 7 days. All patients were discharged on 2nd or 3rd postoperative days. Foley's catheter was removed on 7th day in patients with urethral injury. On follow up at 3 months, 3 patients with conservative treatment had mild to moderate erectile dysfunction. Mean IIEF score in the non-operative group is 16.25 ± 5.05 whereas in operative management group was 22 ± 1.32 (0.021).

CONCLUSIONS

Early operative intervention for penile fracture helps in resolution of penile swelling, pain, and erectile dysfunction. The delayed presentation if still operated will not affect the results; however, conservative management significantly affects erectile function. (0.021).

KEY WORDS

Penile Fracture, Tunica Albuginea, Delayed Repair, Surgical Treatment

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BACKGROUND

Penile fractures are uncommon emergencies dealt by a urologist in emergency. Fernstrom first described the penile fracture in 1957 who recommended surgery after conservative treatment. A Penile fracture is disruption of tunica albuginea of corpora cavernosa which may be associated with injury to corpus spongiosum and urethra due to sudden bending or twisting of the penis. The underlying mechanism is sudden bending of the penis by hitting of penis on bone during intercourse, masturbation leading to increase in intracorporeal pressure exceeding the tensile strength of tunica albuginea. The presentation of penile fracture is variable depending upon the severity of injury and time to presentation.⁽¹⁾ It is a urological emergency which requires surgery to prevent long term sequel of trauma i.e. persistent penile swelling, curvature, corporeal fibrosis, curvature, erectile dysfunction. Patient present with typical history of sudden pop out with detumescence of penis. History and clinical diagnosis are sufficient for diagnosis however ultrasound Doppler by experienced sonologist may be beneficial in some situations. On examination, typical deformity eggplant may be found in most patients. Penile fracture with associated urethral injuries was more common in the US, Europe however less common in Asia due to self-inflicted injuries in later. The management of the penile fracture is suspicion of fracture, early diagnosis, early repair of injury.^(2,3) We present our experience of penile fractures in the tertiary institute of Himachal areas.

METHODS

It was a retrospective cohort study from a single center including 17 patients of penile fractures over 4 years 2014-2018. Patient's records were analysed for the mode of injury, examination finding, investigations i.e. ultrasound, MRI, details of the surgery, erectile dysfunction at 3 months. The difference in complications was analysed with the Fischer exact test (Qualitative) and Mann-Whitney test (Quantitative). All patients diagnosed with penile fractures initially were included in the study and other causes of penile swelling were excluded. We diagnosed patient with a detailed history and clinical examination. All of them underwent hemogram, chest x-ray, and renal function tests. Ultrasound Doppler was sought when the fracture was not palpable due to massive hematoma. MRI was done when the patient fracture was not palpable due to swelling and the patient want conservative treatment.

Our all patients were operated under spinal anaesthesia. Foleys catheter was placed preoperatively and removed on the 1st postoperative day except for urethral injuries in which catheter was removed on 7th postoperative day. Circumcoronal incision followed by degloving of penile skin was done in all cases. The penile hematoma was evacuated and irrigation with normal saline was done. After complete exposure of tunica albuginea site of disruption was identified. The tunica albuginea was repaired with Vicryl 3-0. Erection was checked for potential leak or curvature by injecting normal saline in corpora cavernosa. Adequate haemostasis was achieved and incision was closed. Excess skin was

excised, or partial circumcision was done. Postoperatively antibiotics, analgesics were given. Injectable antibiotics were given for 1 day followed by oral antibiotics for 3 days. Diazepam was given to suppress erections and patient was advised to avoid sexual intercourse for 6 weeks. Patients were followed at 1 month and 3 months. Erectile function was assessed by IIEF (International Index of Erectile Function). The IIEF-5 instrument classifies the severity of erectile dysfunction (ED) into five categories: severe, moderate, mild to moderate, mild and none.

All patients were telephonically contacted for erectile function by International Index of Erectile Function (IIEF-5) at 1 month and 3 months. All patients were assessed at 3 months with IPSS for urinary symptoms and uroflowmetry. The difference in complications was analyzed with the Fischer exact test (Qualitative) and Mann-Whitney test (Quantitative).

RESULTS

We managed 17 patients of penile fractures from 2014-2018, 13 patients underwent surgery and 4 were conservatively managed. The average age ranged from 22-60 years (average 39.67) (Graph 1). Sixteen patients were married, and one patient was unmarried. The mechanism of injury was sexual intercourse in 16 men and trauma due to masturbation in 1 patient. Most patients had a woman on top position however detailed history was lacking due to shyness. Almost all patients had penile fractures during the night.

Most patients hear pop out or snap sound followed by sudden detumescence and penile swelling. All patients presented with penile swelling with one patient also had urethral bleeding on presentation. On examination 16 patients presented with typical eggplant abnormality. The fracture was palpable in 12 patients (70.6%), four patients had large penile swelling and 1 patient had mild swelling which was found to have dorsal vein injury later on. All patients presented sought primary care physician opinion and were thereafter referred to our center, for diagnosis and management thus presenting late.

Ultrasound Doppler was sought in 5 patients however experienced sonologist was not available during an emergency hour, the ultrasonological finding was not relied upon. The ultrasound defect was seen only in 3 patients. MRI was ordered in 3 patients presenting with penile swelling and impalpable defect. In one patient, MRI was suggestive of dorsal vein injury, which was conservatively managed. Other two patients underwent MRI to see for the healing of the tunica albuginea.

Patients presented late mostly due to embarrassment and guilt. Most patients took 4-6 hours to seek physician opinion for penile trauma. Patients were operated as early as possible hours after admission. The mean duration of time from penile injury to surgery was 19.84 hrs. (Graph 2) One patient presented one week after injury with swelling in penis, MRI was done suggestive of tear in tunica albuginea and corporeal hematoma and opted for conservative management. He came 3 months later with decreased albeit mild swelling, the

patient was having erections which were associated with pain. The patient could not be followed after that (Table 1). Another patient presented 1 month after injury with persistent swelling with erectile dysfunction. MRI revealed healing defect in tunica albuginea. The patient wished to continue conservative management. One patient presented 1 week after injury with penile swelling. He opted for conservative management. The difference in complications is mentioned in table 1. The difference in complications was not significant however the difference in erectile dysfunction was significant (0.021).

The patients, who opted for surgery, were approached through circumcoronal incision. The haematoma was drained, and tunica albuginea was exposed. Both corpora cavernosa and corpora spongiosum were visualized to see for injuries. All patients have transverse disruption of tunica albuginea ranging from 5 mm to Hemi transection of both corpora in one patient. The urethral injury was found in 2 patients. Tunica albuginea was repaired with 3-0 Vicryl and suture line over-sewed with Vicryl 3-0. The urethral injury was repaired with Vicryl 3-0 over Foley's catheter.

Complication	Conservative Management (n=4)	Operative Management (n=9)	P
Penile pain	2 (50%)	1 (11.11%)	0.406
Penile Swelling	2 (50%)	0 (0 %)	0.154
Erectile dysfunction	3 (75%)	2 (18.11%)	0.303
Penile curvature	1 (25%)	0 (0%)	0.615
IIEF Score (Mean $\pm$ SD) Max Score- 25	16.25 $\pm$ 5.05	22 $\pm$ 1.32	0.021

Table 1. Complications of Penile Fractures in Operative and Non-Operative Groups

Postoperatively swelling subsided in 3-5 days in 12 patients and one patient in 7 days. Pain decreased in all patients. All patients were discharged on 2 or 3rd postoperative days. Foleys catheter was removed at 7th day in patients with urethral injury. On follow up at 3 months 3 patients with conservative treatment had mild to moderate erectile dysfunction. One patient has mild erectile dysfunction and 2 patients have moderate erectile dysfunction. Two patients had mild penile swelling and one had penile curvature (less than 30 degrees). The patient with dorsal vein injury was normal at 3 months with IIEF of 22. Among patients who underwent surgery, 4 could not be traced and 9 patients were evaluated at 3 months. Two patients had mild erectile dysfunction and 1 patient had penile pain. Mean IIEF score in the nonoperative group is 16.25 $\pm$ 5.05 whereas in operative management group was 22 $\pm$ 1.32 (0.021).

Patients with erectile dysfunction were given tadalafil 5 mg daily and both patients improved after Patients with urethral injury were assessed with IPSS score and uroflowmetry. Both the patients had no urinary symptoms with normal uroflowmetry. Patients with delayed presentation had swelling which persisted from weeks to months. All patients were able to perform intercourse however 2 patients had pain and one patient having swelling and mild curvature with erectile dysfunction.

DISCUSSION

The first penile fracture was described by Malis and Zur in 1924.⁽⁴⁾ The term penile fracture was coined by Fernstrom in

1957. He described the conservative and surgical management of penile fractures.⁽¹⁾ Fracture of the penis is an uncommon entity defined as a disruption of tunica albuginea with rupture of corpus cavernosum. It may be associated with urethral injury as well as sometimes of dorsal vessels.⁽⁵⁾ The tunica albuginea composed elastin and collagen with inner circular and outer longitudinal layers. It is the outer layer which is variable in thickness being thinnest ventrolaterally. The tunica can withstand pressure up to 1500 mmHg.⁽⁶⁾ The mechanism behind the rupture of tunica albuginea is an abrupt increase in intracorporeal pressure exceeding the tensile strength of tunica albuginea. Penile fractures most commonly reported during sexual intercourse sometimes may occur during masturbation.⁽⁷⁾ A fracture occurs during vigorous sexual intercourse, especially when semi-rigid penis slips out of the vagina and hitting perineum or pubic bone, producing a buckling injury. Other mechanisms of injury are rolling over the erect penis, falling on the erect penis and self-manipulation (practice of Taqaandan) The main presenting features are penile swelling, detumescence, urinary difficulty, hematuria, penile pain, etc. On examination, eggplant deformity was seen in almost all patients except one. Sometimes the penile swelling can extend up to scrotum, perineum and suprapubic regions. The swollen penis usually deviates to the side opposite to the site of injury of tunica albuginea.

In our study 16 patients (94.11%) sustained the injury during intercourse and one patient (5.8%) during masturbation. Most penile fractures are transverse laceration distal to the suspensory ligament and located ventrolaterally.⁽⁸⁾ The typical history and clinical presentation sufficient for the diagnosis of penile fracture however in cases of equivocal history and examination; ultrasonography may establish the diagnosis.^(9,10) In our study ultrasound, Doppler was not helpful in management as an experienced radiologist was not available in emergency hours. All patients presented with typical eggplant penile deformity. The defect in tunica albuginea was palpable in 12 (70.58%) patients and not palpable in 5 (29.41%). The mean duration between injury and surgery was 19.84 hrs. Magnetic resonance imaging accurate alternative however it is costly, time-consuming and limited availability.⁽¹¹⁾ In our study it changed management in 2 patients, in one MRI suggestive of dorsal vein injury was conservatively managed and another suggestive of the healed tunica albuginea. The mean defect in the tunica albuginea was 1.2 cm. The differential diagnosis of penile fracture is dorsal vein injury (False fracture), which may be detected by ultrasound Doppler, MRI, or negative exploration. The penile fracture should be repaired as early as possible. We prefer distal circumscising incision and degloving of the penis was done. Exposure of tunica albuginea was done followed by the evacuation of the hematoma. The defect is identified and closed with Vicryl 3-0. Induction of artificial erection with saline is done for initial diagnosis to identify the injury and after repair to confirm. We suture urethral injuries with Vicryl 3-0 over Foley's catheter. Complete urethral injuries should be debrided, mobilized repaired after mobilization. Limited resection of the penile foreskin was done to avoid flap necrosis or removed excessive skin (Due to swelling). Our results showed increased complications in conservative group Penile pain 2 (50%), Swelling 2 (50%) mild to moderate erectile

dysfunction 3 (75%) Penile curvature 1 (25%). In comparison one patient had penile pain, 2 (18.11%) patients had mild erectile dysfunction which improved on treatment. In a study by Atat et al of 300 penile fracture patients the early surgical treatment resulted in decreased complications rates⁽¹²⁾ (Graph 4).

In literature complications of conservative management of penile fractures include curvature (10%), abscess or plaques (25-30%), longer hospital stay, wound complications, penile pain, erectile dysfunction. Although surgery is better than conservative management, surgical delay of up to 7 days after the time of injury does not impact the overall results of repair. Postoperative penile erections were suppressed with oral diazepam for 1-2 weeks, despite limited literature available on this subject.⁽⁹⁾ In our study all patients those are operated the time of surgery was not related to complications of penile fracture. Bozzini et al in the retrospective study concluded erectile dysfunction (50%) was common in conservatively managed patients.⁽¹³⁾ Operative repair results in faster recovery decreased morbidity and lower complication rates (Table 1). The difference in complication i.e erectile dysfunction is significant (0.021) whereas the fewer complications were seen in penile swelling, penile pain, and curvature; however, the difference was not significant. The limitations of our study are retrospective data, less number of patients and the lack of data concerning the time frame from trauma to surgery. Moreover, data regarding the preoperative erectile function status of the patients were not available. Also, preoperative erectile dysfunction status was not known so a comparison could not be made. This study reports increasing awareness of penile fractures among populations in our area. Despite delayed presentation [patient was operated, and results were comparable to early repairs. Patient willing for conservative approach had longer penile swelling, pain, erectile dysfunction, longer time to resume sexual activity.

CONCLUSIONS

Penile fractures are recognized and diagnosed more commonly nowadays. As the patients report more commonly, the management of the penile fracture is evolving. Previously conservative management of penile fractures was advocated; however, complications were seen to be associated with conservative management advocated for early repair of these injuries. Operative intervention for penile fracture helps in resolution of penile swelling, pain, curvature, and erectile dysfunction. Delayed presentation if still operated will not affect the results; however non-operative management significantly affects erectile function. Conservative treatment although should be discouraged, may be given to patients with minimal swelling, with small defects.

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