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An Evaluation of Lateral Incision Approach to Penile Fracture

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Abstract **Original Research Article**

Introduction: Penile fracture is a rare, but underreported, general surgical/urological emergency caused by a blunt trauma to the penis leading to rupture of the tunica Albuginea of the corpus cavernous. Lateral Incision Approach (LIA) is a widely used method in the treatment of Penile Fracture. ***Objective:*** The main objective of this study was to evaluate and analyze the effectiveness of the lateral incision approach in treating the patients of the fractured penis. ***Methods:*** The prospective study was conducted in the department of 250 Bedded General Hospital, Pabna, Bangladesh during the period from January 2016 to December 2018. Maintaining the proper inclusion and exclusion criteria deducting the data of irregular respondents 65 participants were finalized as total study population. ***Results:*** All the patients underwent surgical exploration within 24 hours of admission. Lateral incision approach was used in all of the 65 patients in whom defect could be located using Rolling Sign technique. However, 2 patients needed to be converted to conventional degloving technique owing to failure of locating defect. In total 3 patients needed radiological techniques to determine the site of defect and corresponding lateral incision. ***Conclusions:*** The findings of this study were some good indicators in favor of lateral incision technique for the treatment of penile fracture. So we would like to recommend using lateral incision technique for surgical repair of the fractured penis due to simplicity, early recovery, minimal complications and better patient's compliance.

Keywords: Penile, Fracture, Lateral, Incision, Urology.

INTRODUCTION

The main objective of this study was to evaluate and analyze the effectiveness of the lateral incision approach in treating the patients of the fractured penis. Although the penis has no bones, but the situation occurring in an erect penis mimics fracture sequences that occur in bones. In penile fracture, the cause of rupture is buckling of the tunica albuginea during erection, tunica stretches and changes its thickness from 2mm to 0.25mm, losses elasticity, and due to that penile fracture can occur by implication of blunt force or bending [1]. Fracture of the penis usually results from direct trauma during sexual intercourse, masturbation, bending of the erect penis to achieve detumescence or accidental over in bed. The patient complains of an audible cracking sound (snap or pop), an intense pain, detumescence, immediate swelling (penile deformity), and penile bruising (ecchymosis) with deviation to the side opposite the tear [2]. Some patients may present with bleeding perurethra or acute urinary retention which indicates an associated urethral injury [3]. Findings at presentation include penile swelling, ecchymosis and deformity (the so-called 'eggplant' or 'aubergine' sign). The clinician might be able to illustrate the 'rolling sign', which is the palpation of the localised blood clot over the site of rupture. The presence of blood at the urethral meatus, gross haematuria or voiding difficulties may indicate a urethral rupture. Delayed presentation may result in complications such as erectile dysfunction, penile deviation and plaques resembling those of Peyronie's disease [4]. Penile fracture is a clinical diagnosis but in doubtful cases corpus ultrasonography is helpful in locating and planning for surgery, urethrography can be advised for associated urethral injury [5]. Early surgical exploration clot evacuation and repair of torn *corpus cavernosum* minimizes complication and is best in

comparison to conservative treatment [6]. Majority of penile fracture cases can be diagnosed from the history and physical examination alone. However, radiographic studies may also be required to arrive at a final diagnosis. Prompt surgical exploration involving evacuation of hematoma and corporal repair is the most efficacious therapy. Our study was conducted over a period of 3 years in a tertiary care hospital. In total 72 patients presented with penile fracture during this period. After following study protocols only 65 patients were included in our study. The main aim was to operate patients with penile fracture with lateral incision technique, analyzing its advantages as well as finding cosmetic and functional outcomes of the same. We also aimed to know about the cause of penile fracture in our part of the world through this study.

OBJECTIVES

General Objective

To evaluate the effectiveness of the lateral incision approach in treating the patients of the fractured penis

Specific Objectives

To know about the cause of penile fracture in our part of the world

MATERIAL AND METHODS

It was a prospective study. Conducted in the department of surgery in 250 Bedded General Hospital, Pabna, Bangladesh during the period from January 2016 to December 2018, 72 patients with a clinical diagnosis of penile fracture were admitted in our Department. Among those patients, only 65 patients were enrolled after following the exclusion criterion set for the study, which included: a) Presentation more than 24 hours b) Refusal to treatment c) Refusal to provide a detailed history d) Concomitant illness contraindicating surgery e) second time suspected penile fractures f) penile trauma due to any other cause, and g) contra-indication to spinal anaesthesia. The primary diagnostic assessment was based on clinical history and physical exam. Out of 65 patients, only 34 gave a history of hearing a clicking or cracking sound. The thorough clinical examination was done in all patients. The detailed local examination was carried, and in the majority of cases we noticed localised penile swelling, discoloration, and deviation toward the opposite side of the fracture, often termed as an “eggplant deformity”. In all patients, “Rolling Sign” was performed to elicit which includes detecting the site of the corporal tear. It is used to describe a firm, immobile hematoma, which is palpable as the penile skin is rolled over it. It was positive in 51 patients. In case of any doubt, radiological aids were used. An ultrasound scan was used in 4 cases, and retrograde urethra- cystogram was performed solely in 5 cases in which urethral injury was suspected. The urethral injury was suspected in patients with penile fracture having blood at meatus or urinary retention or both. All 65 patients were operated under spinal anaesthesia in the supine position. Using local examination, the site of rupture was marked. However, in 4 cases, an ultrasound was used for the same purpose. Bladder catheterisation was routinely performed; this helped in the lateral incision procedure and avoided any iatrogenic injury to the urethra. Five cases of suspected urethral injury underwent retrograde urethra-cystogram before the procedure. Out of five, 3 patients had urethral injuries. The surgical technique used consisted of a lateral incision at the site of rupture marked before incision. The size of the incision was variable depending on the size of the hematoma. On an average, the incision length varied from 1.5 to 2cms. The size of hematomas was variable; most of them were in the range of 3-5cm. The first step was to evacuate the hematoma. This was followed by repair of a defect; all corpora cavernosa lesions were treated by interrupted vicryl 3-0 sutures. However, in 3 patients, we had to convert to conventional degloving technique due to inability in locating the site of fracture after initial lateral incision. Furthermore, one patient had a bilateral corporal injury, but we were able to manage him with two lateral incisions. Three patients had associated urethral injuries which were primarily corrected with interrupted absorbable vicryl 5-0 sutures over the indwelling catheter, but in these patients, incision had to be extended. Bladder catheter was maintained for 12 hours after the surgical procedure in routine cases. In patients with urethral injury, an indwelling catheter was kept for 7-10 days.

RESULTS

During analyzing the history of the patients we found the major cause of penile fracture is masturbation. In total 25 (38.46%) patient’s cause of penile fracture was masturbation which was the highest portion. Then it was followed by Vaginal Intercourse (Woman on Top): 36.92%, Vaginal intercourse (Missionary Position): 12.31%, Trauma to an erect penis, 7.69% and Attempted anal intercourse without lubrication: 4.62%. So if we consider the several causes of intercourse totally then that will be the highest portion, 49.23%. In our study all 65 patients were operated under spinal anaesthesia in the supine position. In total 61 patients were successfully operated with lateral technique. So the success rate of Lateral Incision Approach was 93.85%. In 3 patients we had to convert lateral technique to conventional degloving technique due to inability in locating the site of rupture through the small lateral incision. In all these 3 cases, rupture was found on the same side but away from the marked site. Average blood loss was about 32 ml and average operating time was 41:17 minutes. Most patients were discharged after 3-4 days except for five patients who needed to stay longer. In total 3 of them were those who had associated urethral injury and the other 3 developed local infections. Follow up could be done only for six months due to non-compliance on the part of patients. Only 61 patients followed. During that period, among

these 5 we found no major issue regarding flap necrosis, sensory loss over glans and impotence as seen with the conventional degloving procedure. We did not find any patient developing chordee or scar over the shaft of the penis.

Table-1: Causes of penile fracture of participants (N=65)

Component	n/Unit	%
Spinal anaesthesia	65	100
Supine Position	65	100
Ultrasound was used	4	6.15
Location of fracture Site preoperatively	61	93.85
Suspected urethral injuries.	5	7.69
Catheterisation before the procedure	59	90.77
Urethral injury	3	4.62
bilateral cavernosal injury	1	1.54
Lateral incision	65	100
Conversion to degloving technique	3	4.62
Average blood loos	32 ml	
Operative time	41:17 minutes	

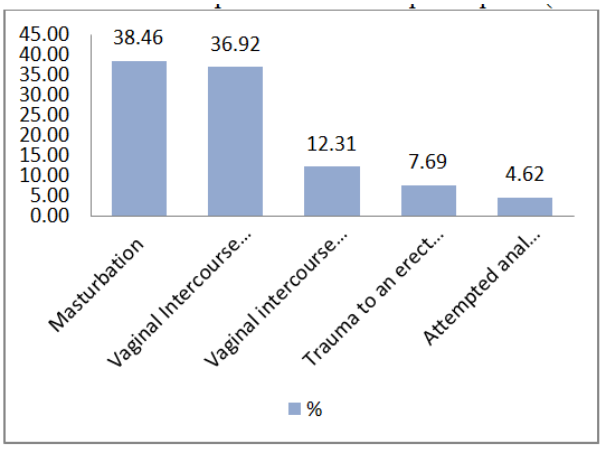

Fig-1: Information regarding the operative procedure (N=65)

DISCUSSION

Penile fracture is a rare urological emergency which occurs only in erected penis, as tunica albuginea thins out from 2.5-5mm to 0.5mm during erection. Normal intracorporal pressure during erection is 100mmHg while as pressure required for fracture penis to occur is 1500mmHg which occurs during sudden bending of erected penis during sexual intercourse, masturbation, rolling over the erected penis or self-bending to achieve detumescence. In present study we found sexual intercourse as a most common cause seen in 49.23% patients and masturbation in 38.46% patients. Malik MH *et al*., 11 in his study of 32 patients, found intercourse as a cause of fracture penis in 90.6% patients and rolling over in bed during erection in 9.4% of patients. Namatullah H *et al*., also found sexual intercourse as commonest cause of fracture penis [6]. Penile fracture is a relatively uncommon condition which involves traumatic rupture of the penis. The condition was first published in 1924 [7] but remains less reported as often patients do not seek medical attention due to embarrassment or fear. Al- though the most common cause is due to the pressure of blunt sexual trauma, some other causes have also been associated with it. It is considered as a urological emergency [8]. Surgical exploration with repair of rupture is the mainstay of treatment. The different approaches are available including distal circumferential degloving incision, as advocated by McAninch [9] to lateral incision directly over the hematoma site [10] or a combination of both. Our study focused on the lateral incision technique directly over the hematoma. However, before discussing in detail about the management of penile fractures, a brief description of anatomy and physiology is a must. The penis is the male sex organ, made up of three expandable erectile tissues -two corpora cavernosa and one corpus spongiosum along the length of the penis. These formations are made of a sponge-like tissue containing trabeculae, irregular blood-filled spaces. The tunica albuginea is the fibrous envelope of the corpora made of extensible tissue; Bucks fascia lies superficial to it. Penile erection or penile tumescence is a complex interaction of psychological, neural, vascular and endocrine factors. As a result of these factors nitric oxide (a vasodilator) levels to rise in the trabecular arter- ies and smooth muscle of the penis causing an increase in the arterial inflow to the penis resulting in enlargement of erectile bodies longitudinally and transversely. This causes a physical state of the penis to change from being flaccid to an erect state. Tunica albuginea thins from 2 mm to 0.25-0.5 mm, stiffens and loses elasticity. Due to this venous stiffness return is impeded and penile tumescence is maintained during male erection. The penile fracture usually occurs when an erect penis undergoes sudden trauma or abnormal bending. This causes a 0.5-4cm transverse tear in tunica albuginea, which is markedly thinned and stiff in erect state. Subsequently, the corresponding corpus cavernosa is injured as well, resulting in hematoma formation, ecchymosis and swelling. If Bucks fascia remains intact, these findings are limited to the penile shaft but if it is violated the ecchymosis may be noticed over perineum, scrotum and lower abdominal wall-"Butterfly Pattern". Furthermore, one or both corpora may be involved, and concomitant injury to the penile urethra may occur. Urethral trauma is more common when both corpora cavernosa are injured [11]. In such cases, an additional clinical finding of blood at meatus may be noticed. The true incidence of penile fracture may not be known as many patients do not seek medical attention due to embarrass- ment or fear [12]. In our study, we had 87 admissions with penile fracture over a period of 6 years. It is higher but is by previous studies that more than 50% cases have been reported from Muslim countries, our place being Muslim majority state [13]. Vaginal intercourse and aggressive masturbation are the most common causes [14]. A recent study

conducted in Brazil in 2014 reported that woman on top positions caused the most significant risk with the missionary position being the safest [15]. In Middle Eastern countries, the penile fracture has been associated with the practice of "Taghaadan" meaning "to click". This is done to achieve detumescence and involves bending the top part of the erect penis while holding the lower part of the shaft in place until a click is heard and felt [16]. As compared to the majority of studies we found masturbation more common cause than vaginal intercourse (women on top). Rare causes included like trauma to erect penis, anal intercourse. However, the practice of Taghaadan is not common in our society. The diagnosis of penile fracture is based on history, local physical features like penile swelling, deviation of the penis, positive rolling sign for locating the site of rupture. Recently, imaging modalities like cavernosography, ultrasonography (USG) and magnetic resonance imaging (MRI) can be used to identify penile fractures. Although soft tissue details in multiple planes are shown best by MRI, from a practical aspect, USG scores over MRI regarding cost, availability and time consumed for the procedure [17]. The most common surgical procedure involves a distal circumferential degloving incision, exposing the entire tunica bilaterally, facilitating diagnosis and repair of coexisting urethral and contralateral injuries [18]. However, studies reveal that this procedure is often associated with increased neurovascular injury and skin necrosis [19]. As such some studies advocate a less invasive lateral incision directly over the hematoma site [20].

Limitations of the Study

Our study was based on the same principle, and all patients were operated by the lateral incision technique although some of them needed conversion to the conventional technique. We found quite useful as it had decidedly fewer complications like neurovascular or skin necrosis.

CONCLUSION

Lateral technique has its flip side like failure to locate the site of fracture and urethral repair is more difficult than with conventional technique.

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