

## PENILE FRACTURE: PROLINE VERSUS VICRYL SUTURES IN PRIMARY REPAIR IMPACT ON ERECTILE AND VOIDING FUNCTIONS

By

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**Objectives:** Evaluation of the sequels and effect of primary repair of penile fracture on the erectile and voiding functions after using non-absorbable proline versus absorbable vicryl suture materials for repair.

**Patients and methods:** Twenty-three patients who had penile fracture were included in this study. Penile fracture was unilateral in all patients. Corpus spongiosum was injured in 2 patients. Primary repair was done within 24 hours after injury. Repair was done using running proline suture (5/0) in seven patients and vicryl (5/0) in sixteen patients including a patient with a past history of a penile plaque. All patients were evaluated clinically after a mean period of 18 months. History and examination for evaluation of erectile function and voiding pattern were done in all patients. Pharmacological erection was induced in five patients. Uroflowmetry after a mean period of seven months was done in eleven patients including the two patients who had corpus spongiosal injury.

**Results:** Four patients of the seven in whom repair was done using proline have stitching pain during sexual activity. Two of these patients have developed insignificant penile curvature on erection. Vicryl suture was well tolerated in all patients. There have been neither stitching pain nor penile curvature during sexual activity in 15 of 16 patients who had no pre-injury penile pathology. One patient had a pre-injury penile plaque and still has a significant penile curvature on erection. Two patients, including the patient with the penile plaque, have had impotence but both had history of pre-penile partial impotence. Fourteen patients had normal erection. All patients have a normal voiding pattern and urinalysis. Uroflowmetric curves were normal in eleven patients.

**Conclusion:** Primary repair with the absorbable vicryl suture is more sound and less morbid than the non-absorbable proline suture. Proline suture may cause pain during sexual intercourse and insignificant curvature on erection. Penile fracture primary repair regains the erectile function in individuals with pre-injury normal erection.

*Key words:* Penis, penile fracture, trauma, penile deformity, erectile dysfunction.

### INTRODUCTION

Penile fracture is rupture of the tumescent corpora cavernosa due to sudden excessive bending of the penile shaft (1, 2). Tunica albuginea becomes thinner during full erection and the sudden increase in the intracorporeal pressure leads to its rupture (1, 3). It may occur after any type of blunt trauma affecting the tumescent shaft as rolling over onto an erect penis (2, 4). The most common etiology still occurs during vaginal intercourse by hitting the perineum vigorously. Patients present with complaints of a classic snapping sound associated with sharp penile

pain. This is followed by rapid detumescence and swelling with or without ecchymosis of the penile shaft (3, 4). Inspection may reveal an eggplant deformity as well as ecchymosis confined to Buck's fascia. A defect in the tunica may be palpated. Condition may be confused with rupture of the deep dorsal artery of the penis or the deep dorsal vein of the penis. Cavernosography and ascending urethrography can demonstrate the tear (5). Sonography helps to demonstrate site of tunical tear (6)

Conservative management indicated significant complications on long-term follow up such as curved or

painful erection, fibrotic plaque precluding erection, arterio-venous fistula, infection and impotence (1,2,3,7,8,9). The immediate primary repair of penile fracture is advocated because it showed excellent long-term results including a decrease in such complications as well as shortening of the hospital stay (10, 11).

In this study, we compare the results and sequels after primary repair in two groups of patients. The first group included seven patients in whom proline suture was used in repair. The second group included sixteen patients in whom vicryl suture was used in repair.

## PATIENTS AND METHODS

Twenty-three men presented with penile fracture were managed at El-Minia University Hospital during thirty-three months duration from January 2000 to September 2002. Patients had a mean age of  $43 \pm 12.3$  years. Nineteen had the penile fracture during sexual intercourse. Eighteen of these patients belong to rural areas.

All patients underwent primary repair within twenty-four hours of trauma. Surgical exploration of the penis was done under spinal anesthesia. A circumferential incision was done two millimeters proximal to the corona glandis. Penile skin was degloved till the penile base. Hematoma was evacuated and the tear was explored for its extension.

The tunical tear was repaired using two different suture materials: Vicryl (5/0) in sixteen patients and Prolene (5/0) in seven, in a continuous manner that were locked at each other stitch. Intra-corporeal injection of saline was done after repair with a compressive bandage at the penile base to test the integrity and efficiency of repair and to exclude any other tears.

After a mean period of eighteen months, patients were clinically evaluated for erectile function and penile deformity during erection. Subjective evaluation included history of the erectile function and voiding pattern. Objectively, penile examination was done during detumescence in all patients. Pharmacological erection was induced in five patients by intra-corporeal papaverine injection. Urine analysis was done for all patients. Uroflowmetry was done in eleven patients including those two with injury involving corpus spongiosum.

## RESULTS

Patients had a mean age of  $43 \pm 12.3$  years. The age of most of the patients at presentation ranged from 40 to 50 years (70%) as shown in age distribution in (Table 1). Sixteen patients (70%) belong to rural areas. Thirteen patients were married and ten were single at time of

presentation. The mean time from onset of the injury to presentation was eleven hours.

Rate of presentation of the condition was 0.7 case/month. The cause of injury was coital injury in 14 patients (60.8%) by hitting the perineum vigorously during sexual intercourse. Seven cases (30.4%) reported that they had a non-coital injury by rolling over an erect penis. Two patients (8.7%) had the injury on trying to induce penile detumescence to terminate sexual excitation. Non-educated patients represent ninety one percent in this series.

Exploration revealed unilateral transverse or oblique corporeal tear on the ventral and lateral aspect in all cases. The tear was in the proximal shaft in 19 patients (83%) and in mid shaft in only four patients. The length of the tunical tear ranges from one to two centimeters in twenty cases (87%) and more than two centimeters in three patients (13%). Extension of tear to the corpus spongiosum occurred in two patients but the urethra was intact in both (8.6%). Nineteen cases had the tear in right corpus cavernosum (83%). There was no intra-operative complication. Postoperative period was uneventful in all patients.

Four patients of the seven in whom repair was done using proline have stitching pain during sexual activity (57%). Deep pressure at the site of healed tear elicits pain in three of them. Two of these patients have developed insignificant penile curvature on erection (29%). Prolene knots were felt by patients themselves and on examination in all patients. All patients in whom repair was done using proline have normal erection before and after repair.

Vicryl suture was well tolerated in all patients. There have been neither stitching pain nor penile curvature during intercourse/masturbation in fifteen out of sixteen patients (94%) who had normal pre-injury penile anatomy. Morning erections have been regained and still preserved in all of these patients. One patient had had a penile plaque before injury. The penile fracture occurred through such plaque. He has developed more significant curvature on erection than before injury (6%).

Erection was normal in the five patients who underwent papaverine injection. Two patients out of all patients in the study (9%) have been impotent after repair. Both had had partial impotence before injury. Both patients had their tear repaired by using vicryl suture. The first was 64 years old patient who has impotence in the form of inability to sustain erection that had been a previous complaint before injury. Cavemosography demonstrated venous leakage in the contralateral corpus spongiosum and not related to the prior tunical tear. The other patient was 62 years old patient who had impotence before injury in addition to a penile plaque in which the tear had occurred.

This patient still has had weak erection in addition to a significant curvature.

All patients included in this study have a normal

voiding pattern and urine stream after repair. There is neither difficulty on voiding nor disturbance in the shape of the urine stream. Uroflowmetry was normal in eleven patients even in those with corpus spongiosal involvement.

**Table (1): Patient' demographics.**

<i>Demographics</i>	<i>Condition</i>	<i>Number</i>	<i>Percentage</i>
1. Age distribution:	- Less than 30 years	3	13%
	- 30 – 40 years	10	44%
	- 40 – 50 years	6	26%
	- More than 50 years	4	17%
2. Residence:	- Rural areas:	16	86%
	- Urban areas:	7	14%
3. Marital status:	- Married:	13	57%
	- Single:	10	43%
4. Education	- Non-educated:	21	91%
	- Well-educated:	2	9.0%

**Table (2): Operative data of the tunical tear.**

	<i>Character</i>	<i>Number of patients</i>	<i>Percentage</i>
- Corpus cavernosum	Right side	19	83%
	Left side	4	17%
- Corpus spongiosum	Superficial	2	6.8%
	Deep tear	0	0%
- Urethral involvement	Involvement	0	0%
- Site of tunical tear	Proximal shaft	19	83%
	Mid shaft	4	17%
- Length of tear	One-two cm	20	87%
	More than 2 cm	3	13%

**Table (3): Rate of erectile and voiding dysfunction.**

	<i>Proline</i>	<i>Vicryl</i>	<i>Total</i>
- Number of patients	7 (30%)	16 (70%)*	23 (100%)
- Pre-injury weak erection	0 (0%)	2 (12.5%)*	2 (9.0%)
- Pre-injury plaque	0 (0%)	1 (6%)	1 (4.0%)
- Pain on intercourse	4 / 7 (57%)	0 / 16 (0%)	4/23 (17%)
- Penile curvature	2 / 7 (29%)	1 / 16 (6%)*	3/23 (13%)
- Impotence	0 / 7 (0%)	2 / 16 (13%)*	2/23 (9%)
- Voiding dysfunction	0 / 7 (0%)	0 / 16 (0%)	0/23 (0%)

\* The patient having a penile plaque.

## DISCUSSION

The penis is protected against trauma by its dependent position and mobility<sup>(12)</sup>. The erect penis is more prone to blunt injury that lead to sudden increase in the intra-cavernous pressure beyond the tensile capacity of the thinned out tunica albuginea<sup>(13)</sup>. The diagnosis of penile fracture is usually based on typical clinical features and associated history. Rupture of deep dorsal vein and the dorsal penile artery are reported in the literature and cause similar clinical situation<sup>(14)</sup>.

Patients had a mean age of  $43 \pm 12.3$  years. In this study, individuals who belong to the middle age group from thirty to fifty years of age were the most commonly affected. The age of marriage in our society and peak of legal sexual activity might explain this age distribution. Eighty-six per cent of the cases belong to rural areas. Thirteen patients were married and ten were single at the time of presentation. Coital injury was the common cause in our study (61%). Thirty percent reported a non-coital injury by rolling over an erect penis. This later percentage is inaccurate because the unmarried patients denied any

illegal sex practice because of the social and traditional viewpoint in our society.

Rate of presentation of the condition in our hospital is 0.7 case/month. This rate is high and still increasing compared to other studies in Egypt: 58 patients in 18 years duration in Delta region <sup>(15)</sup> and 9 patients within 4 years duration in Upper Egypt <sup>(16)</sup>. Higher rates were also reported in Saudi Arabia: seven patients over a nine months duration <sup>(17)</sup> that nearly approaches our result. The true rate and incidence of the condition is difficult to quantify because of the broad range of clinical presentation and the highly underreported nature of the injury <sup>(18)</sup>.

Right corpus cavernosum was more commonly injured than the left in our series (83%). Corpus spongiosum injury occurred in (8.6%) without urethral involvement. The frequency of urethral injury is 20-38% in United States and Europe <sup>(13)</sup>.

The site of tunical tear in our series was in proximal part of the penile shaft in 83% of patients. Penile fracture exclusively occurs distal to the suspensory ligament <sup>(18)</sup>. The distal third of the penile shaft is the most often involved. In our work, the tear length was less than 2 cm in 87% of cases. The length of the tear varies from 0.5 to 4 cm <sup>(19)</sup>. These results parallel those in our results.

As regards pain on intercourse, vicryl is more tolerated by patients than proline. Proline causes pain during intercourse not during erection in 57% of patients whom injury was repaired with proline in our study. This pain is so mild and tolerable that it does not preclude the completion of intercourse. Friction movement of the skin against terminal knots of the non-absorbable suture terminals might be the cause of such pain. Proline knots were felt as tender small lumps beneath the penile skin in all of patients. Nylon suture was reported to cause the same condition <sup>(20)</sup>. In another study, residual fibrosis, in the first postoperative month, was reported due to non-absorbable sutures in one patient and mild pain during coitus in the other one but all patients had full erection and no patient needed additional treatment <sup>(21)</sup>. Vicryl suture was well tolerated in all patients after repair of the penile tear. There is no stitching pain during sexual activity in all patients in whom the penile tear was repaired with vicryl. This is attributed to complete absorption of vicryl suture line and terminal knots within thirty days duration.

As regards penile deformity on erection, the majority of patients (94%) have had normal post-operative penile anatomy on erection. Morning erections were still preserved in all of these patients. One patient had had a penile plaque before injury in which the tear occurred. This patient still has significant curvature on erection (6.3%).

Two patients whom tunical tear was repaired with proline have had insignificant curvature on erection.

Two patients out of all patients in the study (9.5%) have been impotent postoperatively but both had had pre-operative weak erection before injury. Both patients had their tear repaired by using vicryl suture. As both patients had the same complaint before injury, the penile fracture should not be claimed to produce the erectile dysfunction. These results are consistent with other series. Thirty three out of 34 patients reported erection adequate for intercourse without erectile or voiding dysfunction, while two reported mild to moderate curvature <sup>(22)</sup>. Delayed complications were reported in (12.2%) in the form of mild penile curvature on erection, plaques, and/or mild erectile dysfunction <sup>(23)</sup>. In our study, there were neither de novo significant penile curvature nor plaques after primary repair. In Uygur's series, two patients had slight penile curvature that did not impede coitus. At long-term follow-up all patients reported satisfactory erectile function <sup>(24)</sup>. Other series reported a successful outcome, with preservation of sexual function without significant penile curvature <sup>(25)</sup>.

All patients have a normal voiding pattern. There is no significant hematuria on urinalysis. This is attributed to the absence of urethral involvement in our study. Urethral injury repair might leave a stricture urethra that causes stream disturbance. In approximately 20% of cases, the injury may also include the corpus cavernosum with partial laceration in most of the cases or rarely complete transection of urethra <sup>(18,4)</sup>.

## CONCLUSION

Primary repair with the absorbable vicryl suture is more tolerable and less morbid than the non-absorbable proline suture. Repair of cavernosal tear by means of proline suture leads to pain during sexual intercourse in half of the cases and insignificant curvature on erection. Penile fracture primary repair regains normal erectile function in individuals with pre-injury normal anatomy of the penis and normal erection.

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