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ARAŞTIRMA / RESEARCH

Surgical and conservative treatment results of penile fracture: single-center experience

Penil fraktürde cerrahi ve konservatif izlem sonuçları: tek merkez deneyimi

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Abstract

Purpose: The aim of this study was to show that surgical treatment ıf penile fracture (PF) is more advantageous than conservative treatment in terms of complications, but those complications can be seen after surgery also, even may be serious enough to require surgery for a second time.

Materials and Methods: The data of 31 patients diagnosed with PF between 05.04.2019 and 28.07.2021 were evaluated retrospectively. Three patients were excluded from the study because their data could not be accessed. 21 patients who underwent PF repair were determined as group 1 and 7 patients who were followed conservatively because they did not want surgery, as group 2. Causes of PF, admission time to the emergency department, and ultrasonographic (USG) imaging were analyzed. All patients were evaluated with the IIEF-15 form at the sixth month of surgery or conservative treatment. In addition, penile nodules and curvature were evaluated in terms of painful erection after the operation.

Results: The median age for Group 1 was 43±14.52 and 47±14.71 for Group 2. Tunica defect was 7.02±3.26 for group 1 patients and 6.85±4.98 for group 2. When the presence of complications and sexual dysfunction were compared between the two groups, it was found that Group 2 developed significantly more complications and caused more sexual dysfunction.

Conclusion: The treatment of PF with fewer complications is surgical treatment, but it should not be forgotten that surgical treatment may cause complications requiring a second surgical intervention.

Keywords: Tunica defect, sexual dysfunction, tunica albuginea

Öz

Amaç: Bu çalışmada penil fraktürde cerrahi tedavinin komplikasyon olarak daha avantajlı olduğu ancak cerrahi sonrasında da özellikle ikinci kez cerrahi gerektirecek kadar ciddi komplikasyonların görülebileceğini göstermek amaçlandı.

Gereç ve Yöntem: 05.04.2019 ve 28.07.2021 tarihleri arasında penil fraktür tanısı konulan 31 hastanın verileri retrospektif olarak değerlendirildi. 3 hasta verilerine ulaşılamaması nedeni ile dışlandı. Penil fraktür onarımı yapılan 21 hasta grup 1 ve cerrahi istemediğinden konservatif olarak izlenen 7 hasta grup 2 olarak iki gruba ayrıldı. Penil fraktür nedenleri, acil servise başvuru süreleri, ultrasonografik (USG) görüntülemeleri incelendi. Tüm hastalar cerrahi veya konservatif tedavinin altıncı ayında IIEF-15 formu ile değerlendirildi. Ayrıca operasyondan sonra penil nodül ve kurvatür, ağrılı ereksiyon açısından değerlendirildi.

Bulgular: Grup 1 için median yaş 43±14,52 Grup 2 için 47±14,71 idi. Grup 1 hastalar için tunika defekti 7,02±3,26, grup 2 için 6,85±4,98 idi. İki grup arasında komplikasyon ve erektil disfonkisyon (ED) varlığı karşılaştırıldığında Grup 2 de anlamlı olarak daha fazla komplikasyon geliştiği ve daha fazla ED' ye neden olduğu saptandı.

Sonuç: Penil fraktürün komplikasyon olarak daha az olan tedavisi cerrahi tedavidir ancak cerrahi tedavinin de ikinci kez cerrahi müdahale gerektirecek komplikasyonlara neden olabileceği unutulmamalıdır.

Anahtar kelimeler: Tunika defekti, cinsel işlev bozukluğu, tunika albuginea

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INTRODUCTION

PF is a urologic emergent event that is caused by the rupture of tunica albuginea on the corpus cavernosum[1]. It is a rare condition and its incidence is estimated to be 1 in 175.000[2]. The incidence varies according to geographical regions. Its incidence in Turkey and in the world is not yet certain. It can occur due to sexual intercourse, manipulation for relaxing erection (taqaandan maneuver), and aggressive masturbation[3]. When the fracture occurs, sudden loss of erection, pain, swelling, and bruises occur on the penis following the crackling sound[4].

The diagnosis is made by physical examination and anamnesis generally. The USG is cheap and widely used as an assistive diagnostic imaging modality. But the sensitivity of magnetic resonance imaging (MRI) is higher than USG and is also used for certain diagnoses in selective cases[5]. Conservative treatment was the preferred method in PF[6], but when the long-term results are examined, due to the late complications such as penile curvature and erectile dysfunction[7] it seems to be the gold standard is the surgical treatment for now[8]. The conservative treatment ends up with erectile dysfunction in up to 80 % of the patients[9]. Erectile dysfunction is a serious problem that can cause physical and psychological problems for the patient. The incidence of erectile dysfunction after PF repair has been reported to range from 0% to 12%[10] .

In this study, we aimed to evaluate the patients in terms of sexual dysfunction after conservative and surgical treatments and to analyze that although advanced complications and erectile dysfunction development are more common in conservative treatment, surgical treatment may also have serious complications that require secondary surgery.

MATERIALS AND METHODS

This study was carried out between April 5, 2019 and July 28, 2021 in Ankara City Hospital, Department of Urology. The study protocol was approved by the Local Ethics Committee (E2-22-1679). Written informed consent was obtained from the patients by giving necessary information about the study.

Sample

Patients admitted to the emergency department and diagnosed with PF (tunica albuginea defect) as a result of USG, who was consulted to the urology department, were reviewed retrospectively.

31 patients were identified, but 3 patients whose data could not be reached, were excluded from the study. The rest 28 patients' etiologic factors, admission complaints to the emergency department and (USG) imagings were examined. The diagnosis of PF was made by anamnesis, physical examination and USG. Among 28 patients, the patients who underwent surgical operation were classified as Group 1 (n=21), and those who underwent conservative follow-up (n=7) were classified as group 2.

Treatment

The distal degloving method was used in patients who underwent surgery, and 3/0 and 4/0 vicryl sutures were used for repair. Only cold application, bandage on the fracture and nonsteroidal anti-inflammatory drugs were recommended in patients treated conservatively due to their refusal of surgical treatment.

Sexual function assessment

All patients were evaluated with the IIEF-15 form at the sixth month of surgery or conservative treatment. IIEF-15 form is a male sexual function evaluation form consisting of 6 questions for erectile function, 2 questions for orgasm function, 2 questions for sexual desire, 3 questions for sexual satisfaction and 2 questions for general satisfaction. Scoring for erectile function No ED (EF score, 26-30), mild ED (EF score, 17-25), moderate ED (EF score, 11-16), and severe ED (EF score, ≤10), Orgasm was scored 0-10, sexual desire 2 Scoring was -10 points, sexual satisfaction was 0-15 points, and general satisfaction was 2-10 points. In addition, surgical complications such as the presence of penile nodules by superficial USG and physical examination, and the presence of curvature by placing a protractor on the curvature in patients with complaints of penile curvature were identified and painful erection was questioned. Two different urologists evaluated the clinical outcomes and the two groups were compared

Statistical analysis

SPSS 24 software (IBM SPSS Statistics, IBM Corporation, Chicago, IL) package program was used

for statistical analysis. Pearson Chi-Square test was used to compare non-categorical variables. The normal distribution of the data was evaluated using the Shapiro-Wilk test.

Variables were expressed as mean ± standard deviation or median (minimum-maximum) values. Categorical variables were expressed as percentages, and cases with a p-value below 0.05 were considered statistically significant. A total of 25 patients should be included in order to determine the differences between the groups treated conservatively and surgically for PF with an error level of a=0.05 and a power of 0.80.

RESULTS

The median age for Group 1 was 43±14.52 years and 47±14.71 years for Group 2. Demographic data, hospital admission times, etiology, advanced complications, defect size and localization in USG are given in Table 1. The results of the sexual satisfaction rating 6 months after the operation are given in Table 2. As admission symptoms, penile deviation in 3 patients, breaking sound in 8 patients, detumescence in 4 patients, penile swelling and edema in 22 patients, pain in the penile region in 18 patients, and hematoma in the penile region in 11 patients were detected.

Table 1. Demographic data, etiology, complications and defect characteristics

Patients (n=28)	Group 1 (n=21)	Group 2 (n=7)	p Value
Age, median±SD (Years)	43±14,52	47±14.71	
Time to apply to the hospital, mean±SD (hr)	5.21±5.03	7.28±5.61	
Etiology, n (%)			
During coitus	8 (38)	2 (28.5)	
Manual manipulation of the penis	4 (19)	0	
Rolling	2 (9.5)	2 (28.5)	
Trauma	2 (9.5)	2 (28.5)	
Masturbation	5 (34)	1 (14.5)	
Complications, n (%)			
Yes	7 (33)	6 (85.7)	0.029
No	14 (66)	1 (14.3)	
Defect features in cases			
Defect Length (mm*)	7.02±3.26	6.85±4.98	
Cavernosal defect localization			
Right	7	3	
Left	14	4	

*mm: millimeters, SD: standard deviation

Table 2 Penile fracture after surgery or conservative treatment of sexual dysfunction

Sexual dysfunction (n=28)	Group 1 (n=21)	Group 2 (n=7)	p Value
Sexual dysfunction n (%)	3 (14.3)	6 (85.8)	0.002
Mild impairment	2	1	
Moderate impairment	1	4	
Severe impairment	0	1	

The mean admission time of the patients to the hospital was 5.21±5.03 hours for group 1 and 7.28±5.61 hours for group 2. The mean hospital stay of the patients who underwent surgical repair was found to be 2.47±1.66 days. As complications after surgery (n=21), penile nodule developed in 1 patient (%4.76), painful erection and penile curvature in 1 patient (%4.76), penile curvature alone in 4 patients (%19.04), and urethrocutaneous fistula in 1 patient. In conservatively followed patients, penile curvature with penile nodule developed in 2 patients (%28.57), only penile nodule in 2 patients (%28.57), only penile curvature in 1 patient (%14.28), and painful erection in 1 patient (%14.28).

When the presence of complications and erectile dysfunction was compared between the two groups,

it was found that Group 2 developed significantly more complications (p=0.029) and caused more erectile dysfunction (p=0.002).

DISCUSSION

PF occurs after blunt trauma of the erected penis that results in the rupture of tunica albuginea, which forms the integrity of the corpus cavernosum. Sexual intercourse in Europe and America[11], and manipulation to achieve detumescence (taqaandan maneuver) in Middle East countries are the most common causes[12]. In addition, turning over the erect penis and masturbation can be counted among the reasons[13]. Detailed history and physical examination are important for the diagnosis. In most of the patients, a crackling sound during fracture is described. After this, sudden loss of erection, acute onset pain, and bruising on the penis can be seen. If the present laceration site doesn't exceed Buck's fascia, the clinical picture is defined as eggplant deformity-the aubergine sign. But if it exceeds this fascia, the hematoma can spread to perineal and scrotal areas and it is defined as butterfly hematoma[14].

The laceration site may be palpated. For the diagnosis, USG, cavernosography and magnetic resonance imaging (MRI) can be used[5,15]. Cavernosography is not widely used because it has increased false negative and positive rates and also the high risk of priapism, allergic reactions and infection. Although its high false negative results, the USG is widely used because it is a non-invasive method[16]. It was determined in a study that MRI findings showed 100% sensitivity and 87.5% specificity in the diagnosis of PF when compared with surgical exploration and that it would help the surgeon in localization before exploration[15,17]. In our study, these additional imaging modalities were not used other than USG.

The urethral injury should also be evaluated in patients who develop a PF. Urethral traumas are seen less frequently in Asian, Middle Eastern and Mediterranean countries compared to Europe and America[18]. In case of concomitant urethral trauma, blood can be seen in the urethral meatus and diagnosis can be made by retrograde urethrography when suspected. However, in a PF patient, intervention with flexible cystoscopy is recommended instead of retrograde urethrography without placing a urethral catheter during the operation[19].

Exploration is recommended only in patients for whom a definitive diagnosis cannot be made by history, physical examination and imaging methods[20]. There are cases that can be confused with the diagnosis of PF. These include the rupture of the penile superficial dorsal vein[21], deep dorsal vein[22], dorsal artery, and deep cavernous vein structures that may occur during sexual intercourse. If the cavernosal integrity is not deformed, only analgesic, cold application and bed rest are recommended. When the diagnosis is PF, surgery should be performed by informing the patient about the complications secondary to the surgery, unless the patient refuses the surgery[8].

There are two techniques commonly used in PF repair. Distal degloving and penoscrotal incision, among these, subcoronal degloving incision is more commonly used and facilitates better evaluation of corporal bodies and intervention if the urethral injury is present[23,24] Bozzini et. al[25] described that, if the time between hospitalization and surgery exceeds 8.23 hours, erectile dysfunction rates increase after the operation. There are studies reporting the development of erectile dysfunction as 50-80% as a result of conservative follow-up in PF, and the overall complication rate is 80%[9] Yapanoglu et al.[26] described that due to emergency surgical repair is the most effective in the treatment of PF and has the lowest complication rate, it was preferred over conservative treatment.

In our study, surgery was recommended for 28 patients diagnosed with PF, and 7 patients who did not accept surgery were followed up conservatively. When patients with conservative treatment are examined, more penile nodule formation and more penile curvature[27] are more likely to develop sexual dysfunction compared to surgical treatment[28].

It has the advantage of being less likely to have painful erections in emergency surgeries compared to conservative treatment. However, post-surgical complications such as erectile dysfunction and urethrocutaneous fistula should be considered, which may require secondary surgery. Complications that require a second surgery after surgical treatment can be obtained in larger series about the psychological and physical complications such as ED.

The limitations of our study are that it is a retrospective study and the number of patients treated conservatively is low.

In conclusion, PF is an emergent situation that requires surgical intervention. It decreases long-term complication rates. The conservative treatment has increased complications but in some operated patients, complications like erectile dysfunction, urethrocutaneous fistula, penile nodule and curvature can be seen also.

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