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Surgical Treatment of Peyronie's Disease: Single-centre Experiments

Peyronie Hastalığında Cerrahi Tedavi: Tek Merkez Deneyimi

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ABSTRACT

Objective: We aimed to share the data of the surgeries that we performed in our clinic and to compare this with other findings in the literature.

Methods: The files of 24 Peyronie's disease (PD) patients operated in our clinic between August 2015 and July 2018 were retrospectively reviewed. Eight of these patients had mild curvature (<60°), while the other 16 patients had severe curvature (>60°). The penile curvatures below 60° were corrected by the Nesbit method, and curvatures above 60° were operated by venous grafting. Erectile dysfunction (ED), International Index of Erectile Function (IIEF)-5 score and PD questionnaire (PDQ) were evaluated preoperatively and post-operatively. Moreover, anatomical and functional success was evaluated.

Results: The curvature of six patients operated using Nesbit method was 44.16°± 2°. No residual curvature was observed during the post-operative follow-up. The mean preoperative penile length derived from all the patients was 12.57±3.1 cm and the post-operative penile shortening was 15±9.2 mm. The curvature of 18 patients who underwent venous grafting was 77.5°±9.5°. Also, post-operative residual curvature was calculated to be 15.41°± 9.8°. A total of 12 of patients who underwent surgery using this technique had ED; however, only two of these patients did not benefit from the medical treatment. Therefore, these two patients underwent penile prosthesis implantation in the same session. IIEF-5 and PDQ scores improved significantly in both groups (p<0.05).

Conclusion: Surgical treatment is the gold standard for PD. An appropriate surgical procedure should be selected based on the degree of penile curvature and ED of the patient. Anatomic and functional success is quite satisfactory for patients.

Keywords: Peyronie's disease, erectile dysfunction, penile curvature, IIEF, PDQ, corporoplasty

ÖZ

Amaç: Kliniğimizde gerçekleştirdiğimiz ameliyatların verilerini paylaşmayı ve literatürdeki diğer bulgularla karşılaştırmayı amaçladık.

Yöntemler: Kliniğimizde Ağustos 2015 ile Temmuz 2018 tarihlerinde ameliyat edilen 24 Peyronie hastalığı (PH) hastaları retrospektif olarak incelendi. Hastaların 8'inin kurvatürü ciddi olmamakla beraber (<60°) diğer 16'sının kurvatürü ciddi (>60°) denilecek boyuttaydı. Kurvatürü 60°'nin altında olanlara Nesbit yöntemi, kurvatürü 60°'nin üstünde olanlar venöz greftleme yöntemiyle opere edildi. Hastaların ameliyat öncesi erektil disfonksiyon (ED), Uluslararası Erektil Fonksiyon İndeksi (IIEF)-5 skoru ve PH sorgulama formu (PDQ) sonuçları post-operatif değerleriyle karşılaştırıldı. Anatomik ve fonksiyonel başarı değerlendirildi.

Bulgular: Nesbit yöntemiyle opere edilen 6 hastanın kurvatür derecesi 44,16°±2° idi. Post-operatif takiplerinde rezidü kurvatür izlenmedi. Bu hastaların preoperatif ortalama penis uzunluğu 12,57±3,1 cm iken post-operatif penil kısalma miktarı 15±9,2 mm olarak ölçüldü. Ameliyat öncesi hiçbir hastada ED yoktu. Venöz greftleme yapılan 18 hastanın kurvatür derecesi 77,5°±9,5° idi. Post-operatif rezidü kurvatür derecesi 15,41°±9,8° olarak tespit edildi. Bu teknikte ameliyat edilen hastaların 12'sinde ED vardı fakat sadece 2'si medikal tedaviden fayda görmediği için aynı seansta penil protez implantasyonu yapıldı. IIEF-5 ve PDQ skoru iki grupta da istatistiksel açıdan anlamlı şekilde düzeldi (p<0,05).

Sonuç: PD'de cerrahi altın standart yöntemdir. Penil kurvatür derecesi ve hastanın ED durumuna göre uygun ameliyat yöntemi seçilmelidir. Anatomik ve fonksiyonel başarı hastalar için oldukça tatmin edicidir.

Anahtar kelimeler: Peyronie hastalığı, erektil disfonksiyon, penil kurvatür, IIEF, PDQ, korporoplasti

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INTRODUCTION

Peyronie's disease (PD) is a disease that affects the tunica albuginea of the penis. Elastic fibres in this tissue replaces fibrous scar, which causes deformity during penile erection. PD occurs in 0.7%-11% of adult males and is generally diagnosed by painful erections, sometimes with erectile dysfunction (ED) and palpable plaques (1). In general, this disease is observed in patients with diabetes mellitus (DM), hypertension (HT), lipid abnormalities, ischaemic cardiomyopathy, ED, smoking, alcohol consumption. Penile curvature is expected to worsen in 30% to 50% of the population and stabilise in 47% to 67% of patients. Approximately, 3%-13% of patients are spontaneously healed (2). The main goal of surgery is to correct the curvature and allow coitus. However, surgery is accompanied with certain risks, such as penile shortening, ED, penile numbness, recurrent curvature and palpable knots and stitches (3). There are two types of surgery defined for this purpose: Penile shortening and penile lengthening procedures. In cases of ED, the key determinant factors that influence the choice of surgery suitable for the patient include penile length assessment, curvature severity, erectile function status and response to pharmacotherapy. Penile shortening is applicable for degrees of curvature below 60°, and the Nesbit or plication procedures are generally suitable choices. Grafting procedure is a suitable method when the degree of curvature is above 60° or complex. The implantation of an inflatable penile prosthesis is considered the best option in cases where ED does not respond to pharmacological treatment.

METHODS

We retrospectively analysed the files of a total of 24 PD patients who underwent surgery in our clinic between August 2015 and July 2018. All patients were informed in detail before the surgery and their consents were obtained. First, the patients were evaluated using lateral, dorsal and ventral images while their penises were erect. An intracavernosal artificial erection was successful in patients without self-erection. Before the surgery, penile length, curvature degree and curvature localisation of the patients were recorded and compared with post-operative values in follow-up. Physical examination was performed to carefully observe any Dupuytren contracture or Ledderhose disease. In this study, patients without erectile pain, but having curvature for more than six months, were included.

In addition, degloving from the circumference line was performed for all patients. Also, patients with dorsal intervention were dissected and preserved on both sides with a neurovascular bundle. Nesbit method was applied for the penile curvature between 30° and 60°. Allis clamp was used to firmly grasp from the maximum curvature point after artificial erection was achieved. Tunica albuginea was superficially excised with a scalpel and scissors. The remaining layers were sutured with 2/0 polydioxanone sutures (PDS) and penile erection was examined. Lengthening surgery was performed on patients with severe curvature (>60°). The defects of the tunica albuginea were closed with autograft taken from the saphenous vein. The grafts were folded on their own and placed in the defect zone using 5/0 PDS. Patients who underwent penile prostheses were placed with a penoscrotal incision and, in this procedure, a two-piece inflatable penile prosthesis was used. On the first post-operative day, urethral catheters were withdrawn and patients were discharged. In the 3rd and 12th post-operative month, penile length and residual curvature were recorded. All patients were evaluated using Peyronie's disease questionnaire (PDQ) and International Index of Erectile Function (IIEF)-5 score preoperatively and post-operatively. At the end of one-year follow-up, the physical straightening achieved (including residual curvature of ≤30°) was accepted as anatomical success. The satisfaction in sexual intercourse (increase in IIEF-5 score) was accepted as functional success.

Statistical Analysis

Categorical measurements were summarised as numbers and percentages, while numerical measurements were summarised as mean and standard deviation. Chi-square test was used to compare categorical measurements between groups. In addition, Shapiro-Wilk test was used to determine whether the numerical measurements met the normal distribution assumption. For comparison of the numerical measurements between the groups, the Student's t-test was used in the independent groups, and the Mann-Whitney U test was used if the assumptions were not met. Paired t-test was used for the preoperative-post-operative comparisons. Preoperative-post-operative comparisons in the amounts exchange were analysed by Mann-Whitney U test. IBM SPSS Statistics, Version 20.0 for Windows (IBM Corp., Armonk, NY, USA) was used for the statistical analysis. The statistical level of significance was set as 0.05 in all tests.

RESULTS

In this study, the mean age of the 24 patients was 60.87±6 years. There was no significant contracture in the other part of the body. Two patients had dorsal curvature, one patient had dorsolateral curvature and the remaining 21 patients had ventral curvature. The average curvature was 69.16°±16.9° and the mean penile length of the patients was 12.25±2.2 cm. After the lengthening surgery, the residual curvature level was 15.41°±9.8°; however, there was no residual curvature found in any of the patients who were treated by the Nesbit method. In addition, for patients who were treated by the Nesbit method, the mean penile length was 12.57±3.1 cm, while the mean shortening was 15±9.2 mm.

Furthermore, five patients had DM, four patients had HT and eight patients had both DM and HT. Also, two of the eight patients with both DM and HT had coronary artery disease. No additional morbidity was observed in seven patients.

Moreover, 12 out of 18 patients who had lengthening surgery had preoperative ED (Table 1). Penile prosthesis was performed on two patients, since they did not benefit from drug treatment. These two patients had curvatures of 75° and 90° preoperatively. In the surgery, Wilson manoeuvre was employed concurrently

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to straighten the penis. In the 3rd month of post-operative follow-up, only five patients were disturbed by suture line (palpable knots); however, they adapted to the situation and no irritating symptoms recurred. There was no complaint of penile numbness, wound infection, hematoma, penile skin necrosis or urethral injury.

Anatomical success was achieved in all patients, since the residual curvature was below 30° after the surgery. Functional success was accepted as an improvement in IIEF-5 and PDQ scores. Also, IIEF-5 scores increased significantly in both groups (p=0.001) (Table 2) (Figure 1). The increase in the lengthening group (12.4±2.9 mm) was statistically different from that in the shortening group (8.2±2.8 mm) (p=0.007) (Figure 2). PDQ scores decreased significantly in both groups (p<0.001) (Table 3) (Figure 3). When the amount of change was examined in PDQ scores, the decrease in the lengthening group (38.7±18.2 mm) was more than that in the shortening group (14.8±2.8 mm) (p=0.003) (Figure 4).

Table 1. Characteristics of patients with Peyronie's disease

	Shortening/Nesbit	Lengthening	p values
Patients number	6	18	-
Age (years)	61.16±7.4	60.77±5.7	0.894
Ventral	5	16	0.999
Dorsal	1	2	
Diabetes mellitus	3	10	0.999
Hypertension	3	9	0.999
Coronary artery disease	0	2	0.999
Curvature degree	44.16°±2°	77.5°±9.5°	<0.001
Penile length (cm)	12.57±3.1	12.06±2.4	0.679
Residual curvature	0	15.41°±9.8°	NA
Penile shortening (mm)	15±9.2	-	NA
Preoperative ED	0	12	0.014

ED: erectile dysfunction, NA: not applicable

Table 2. Changes in IIEF-5 scores

	Preoperative IIEF	Post-operative IIEF	p values
Shortening/Nesbit	11.0±3.7	19.2±1.5	0.001
Lengthening	8.2±1.9	20.7±2.0	<0.001

IIEF: International Index of Erectile Function

Table 3. Changes in PDQ score

	Preoperative PDQ	Post-operative PDQ	p values
Shortening/Nesbit	35.0±13.7	20.2±11.5	<0.001
Lengthening	45.3±18.9	6.6±1.5	<0.001

PDQ: Peyronie's disease questionnaire

DISCUSSION

Surgical intervention is the gold standard treatment method for PD. Plication/Nesbit surgery should be prescribed for the patients

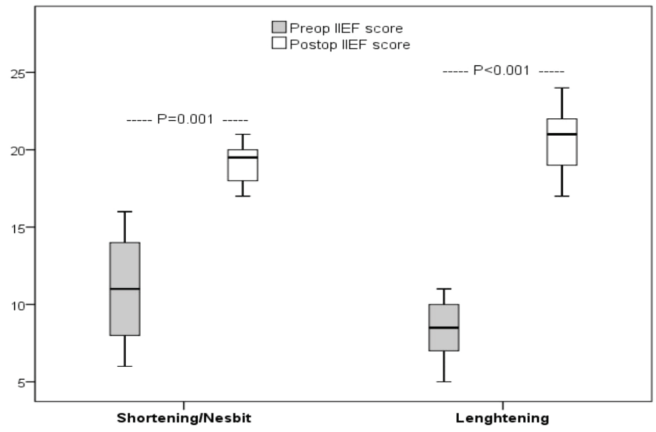

Figure 1. IIEF score changes in both methods
IIEF: International Index of Erectile Function

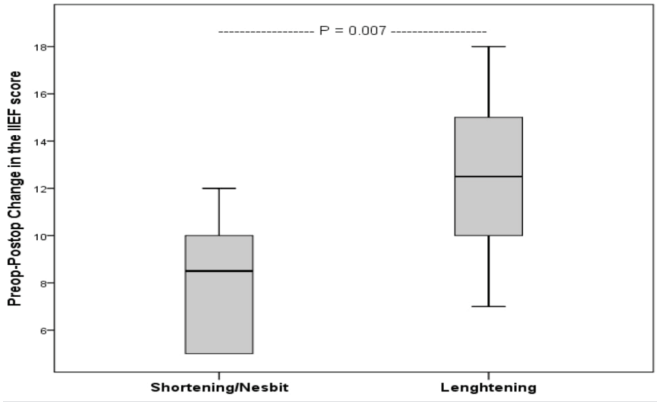

Figure 2. Comparing IIEF scores in both methods
IIEF: International Index of Erectile Function

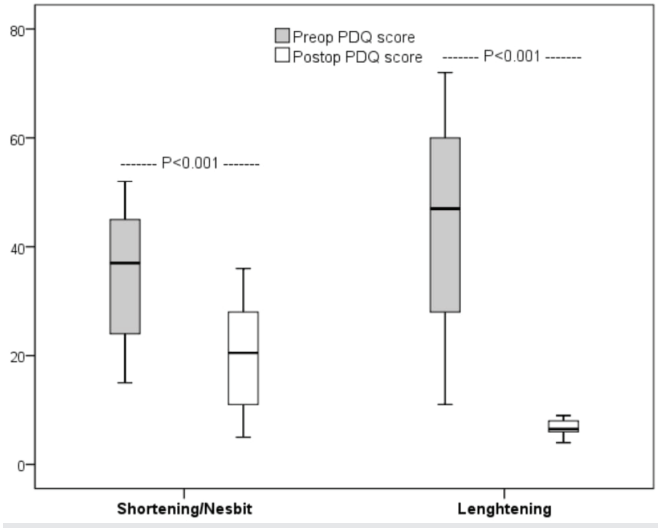

Figure 3. PDQ score changes in both methods
PDQ: Peyronie's disease questionnaire

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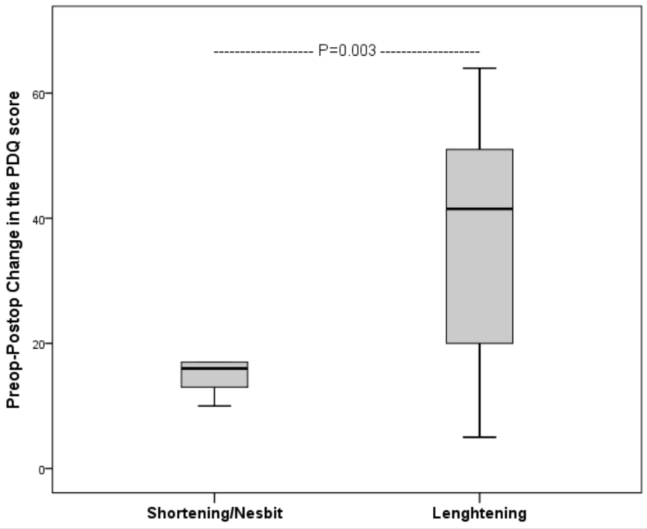

Figure 4. Comparing PDQ scores in both methods
PDQ: Peyronie's disease questionnaire

with adequate erectile function (with or without pharmacotherapy), adequate penile length and mild curvature, but without the presence of hourglass deformity causing hinging. From two large case series investigating penile corporoplasty surgery, penile shortening with an interval of 1.5-3.0 cm was detected in 13% of the patients. Also, sexual disability due to shortness of the penis was reported in 1.6%-1.8% of the patients (4,5). The shortening measures employed in our series were similar to those series and our patients were satisfied with the penile shortening. They reported that performance of sexual functions and appearance for self-confidence was of utmost importance. Moreover, they did not realise the shortening in penile length. However, further shortening of the penile length would probably be less tolerable by patients. The lengthening method was used in those with higher degrees of curvature.

Paulis et al. (6), in their series, detected 7.4% DM and 20.7% HT disease in a total of 309 PD patients. There was no significant difference in PD between ED and non-ED patients. In this study, patients with ED had these comorbidities; however, these diseases were not encountered in half of the non-ED group. Although these diseases were seen more frequently in patients with ED, they support our data. However, much larger series of studies are needed to find a more accurate relationship.

In the past, ED and temporary loss of penile sensation were reported in very high ratios. Presently, these ratios have significantly decreased. Çayan et al. (7) reported that 4.7% patients with post-operative ED experienced difficulty in sexual intercourse due to penile sensory loss. In contrast, ED was not observed in any of our patients after surgery. We were very careful during the dissection with neurovascular bundle in order to prevent both post-operative ED and loss of penile sensation. Correction of the physical deformity is very important for patients, but post-operative loss of penile sensation and even ED can be quite dissatisfying for patients. This affects their IIEF-5 and PDQ scores, resulting in decreased functional and anatomical success. IIEF-5 and PDQ scores are the most basic scales for erection power, duration and sexual satisfaction in patients. They are very useful in comparing subjective values to show the situation before and after surgery. Thus, they provide important information regarding whether the patients benefit from the surgical intervention or not. In literature, there are many studies investigating preoperative and post-operative IIEF score in PD (8,9). Also, PDQ is generally used for results of collagenase *Clostridium histolyticum* injection treatment successfully (10). According to our data, there is an improvement in these scores in both surgical methods. Post-operative values of the patients were quite satisfactory compared to their preoperative values. In fact, the lengthening surgery was found to be more successful in both scales than the shortening/Nesbit surgery. The reason for this is that the degree of curvature is higher, making the patients more desperate.

Study Limitations

This study has some potential limitations. First, the charts of the patients were gathered retrospectively. Second, in order to generate more accurate data, it is necessary to include a larger population of the patients, since the power analysis of our study was low. Lastly, the follow-up period of the patients is short. If the patients were followed for a longer period, we may have additional data to compare the preoperative and post-operative situations.

CONCLUSION

Surgery is the gold standard method of treatment for PD. The results are quite satisfactory when the appropriate surgical method is chosen. Post-operative successful results were obtained both anatomically and functionally after the surgery.

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Hasta Onamı: All patients were informed in detail before the surgery and their consents were obtained.

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