E-ISSN: 2148-0532

ENDOÜROLOJİ BÜLTENİ
ENDOUROLOGY BULLETIN

Period: Triannual Founded: 2008 Publisher: Endourology Society Volume 16 / Number 2

www.endouroloji.org

ENDOÜROLOJİ BÜLTENİ
ENDOUROLOGY BULLETIN

Contact
Prof.Nurettin Mazhar Öktel Sk.
Lale Palas Apt. 10/2 34381 Şişli-İstanbul
+90 541 710 34 05
http://www.endouroloji.org.tr
endouroloji@endouroloji.org.tr

e-ISSN
2148-0532

Publisher
Pera Yayıncılık Hizmetleri
https://perayayincilik.com

OPEN ACCESS

Değerli Meslektaşlarımız,

Endoüroloji Bülteni Editör Kurulu olarak öncelikli hedefimiz, Endoüroloji Bülteni'nde yayınlanan makalelerin, uluslararası indekslerde görünürlüğünü arttırmak için gerekli gelişmeleri sağlayabilmektir.

Endoüroloji Bülteni hakkında güncel bilgilere yeni web adresimiz www.endourolojibulteni.com üzerinden ulaşabilirsiniz.

2024 yılının ikinci sayısında dört adet birbirinden değerli bilimsel makale bulunmaktadır. Bu bağlamda makalelerini Endoüroloji Bülteni aracılığıyla paylaşmayı tercih eden tüm meslektaşlarımıza teşekkürlerimizi sunmakla beraber, bilimsel faaliyetlerinizle dergimizi desteklemeye devam etmenizi temenni ederiz.

Saygılarımızla,
Prof.Dr. R. Gökhan ATIŞ
Editör

Prof.Nurettin Oktel St
Lale Palas Apt 10/2
Sisli / Istanbul
Türkiye
T: +90 541 710 34 05
e-mail: endouroloji@endouroloji.org.tr
http://endouroloji.org.tr

EDITORIAL BOARD
YAYIN KURULU

Prof.Nurettin Oktel St
Lale Palas Apt 10/2
Sisli / Istanbul
Türkiye
T: +90 541 710 34 05
e-mail: endouroloji@endouroloji.org.tr
http://www.endouroloji.org.tr

REVIEWERS' LIST
HAKEM LİSTESİ

ABDULLAH DEMİRTAŞ
ABDULLAH ERDEM CANDA
ABDÜLMUTTALİP ŞİMŞEK
ADEM SANCI
AHMET TAHRA
AKİF ERBİN
ALİ İHSAN TAŞÇI
ALİ SERDAR GÖZEN
ALPER ÖTÜNÇTEMUR
ALTUĞ TUNCEL
ARİF AYDIN
BİLAL ERYILDIRIM
BÜLENT ERKURT
ÇAĞATAY ÇİÇEK
EMRAH YÜRÜK
EMRE CAN POLAT
ERDEM KISA
ERSAN ARDA
EYÜP VELİ KÜÇÜK
EYYÜP SABRİ PELİT
FAHRİ ERHAN SADİOĞLU
FATİH ALTUNRENDE
FEVZİ ARDA ATAR
GÖKHAN ECER
HAKAN KILIÇARSLAN
İBRAHİM KARABULUT
JEAN DE LA ROSETTE
KADİR ÖMÜR GÜNSEREN
KEMAL ERTAŞ
KEMAL SARICA
M.ÖNER ŞANLI
MAHMUD ZAHİD ÜNLÜ
MEHMET FATİH AKBULUT
MEHMET İLKER GÖKÇE
MEHMET SALİH BOĞA
MELİH BALCI
MURAD AKAND
MURAT ZOR
MUSTAFA ZAFER TEMİZ
NECİP PİRİNÇÇİ
ÖMER ONUR ÇAKIR
PİLAR LAGUNA
SELÇUK ŞAHİN
SERCAN SARI
SERDAR ARISAN
SERDAR YALÇIN
SİNAN ÇELEN
TAHA UÇAR
TAYFUN OKTAR
TZEVAT TEVFİK
URAL OĞUZ
VAHİT GÜZELBURÇ
VOLKAN SELMİ
YAVUZ ONUR DANACIOĞLU
YİĞİT AKIN
YILMAZ ASLAN

Prof.Nurettin Oktel St
Lale Palas Apt 10/2
Sisli / Istanbul
Türkiye
T: +90 541 710 34 05
e-mail: endouroloji@endouroloji.org.tr
http://www.endouroloji.org.tr

CONTENTS
İÇİNDEKİLER

Original Research Özgün Araştırma

Indexed in TUBITAK-ULAKBIM TR-Dizin, Index Copernicus, EuroPub, Scilit, Asos Index and Turkiye Atıf Dizini.

Original Article
Özgün Araştırma

Endourol Bull. 2024;16(2):50-57. doi: 10.54233/endourolbull-1423624

What may be Related to Patient Satisfaction in Prostate Biopsies?

Prostat Biyopsilerinde Hasta Memnuniyeti Nelerle İlişkili Olabilir?

Nihat Türkmen, Taner Hacıosmanoğlu

Department of Urology, University of Health Sciences, Sisli Hamidiye Etfal Training and Research Hospital, İstanbul, Türkiye

ÖZET

Amaç: Prostat biyopsisi yapılan hastalarda hasta memnuniyetini etkileyen faktörleri araştırmak.

Gereç ve Yöntemler: Transrektal ultrasonografi (TRUS) eşliğinde prostat biyopsisi yapılmasına karar verilen, yaşları 48 ile 86 arasında değişen 241 hastanın 237'si prospektif olarak değerlendirildi. İşlem öncesinde hastaların yaşı, vücut kitle indeksi (VKI), prostat spesifik antijen (PSA) değerleri, prostat hacmi, pozitif parmakla rektal muayene (PRM) bulguları ve biyopsi endikasyonları kaydedildi. Biyopsi esnasında hisedilen ağrı düzeyi, görsel ağrı skorlama (VAS) ile puanlandı. Biyopsi sonrasında hasta memnuniyeti 4 puanlık ölçek ile değerlendirildi.

Bulgular: Değerlendirmeye alınan 237 hastadan 92'si işlemden memnun değil iken, 145 hasta memnundu. Grup 1 ve Grup 2'nin ortalama yaşları 65,9±8,1 ve 66,1±7,6 yıl, VKI 27,7±4,0 ve 26,3±3,9 kg/m2, PSA düzeyleri 58,6±304,6 ve 17,9 ± 68,1 ng/ml, Prostat hacmi 59,4 ± 51,8 ve 51,8 ± 28,7 cc Ortanca VAS skoru sırasıyla 4 (3-6) ve 4 (2,5-6) idi. PRM bulguları pozitif olan grubun memnuniyet düzeyi 3 (2-3) iken, negatif olan grubun 3 (2-3) olarak bulundu. Tümor varlığı pozitif olan grubun memnuniyet düzeyi 3 (2-3) bulunurken, tümor bulunmayan grubun memnuniyet düzeyi 3 (2-3) idi. Perinöral invazyon görülen grubun memnuniyet düzeyi 3 (2-3)iken, görülmeyen grubun memnuniyet düzeyi 3 (2-3) olarak bulundu.

Sonuç: TRUS eşliğinde yapılan prostat biyopsilerinde hastanın memnuniyet düzeyi ile hastanın yaşı, serum PSA düzeyi, prostat hacmi, hissedilen ağrı düzeyi, pozitif PRM bulgusu, pozitif tümor patolojisi veya histolojik olarak tumorün perinöral invazyonu arasında ilişki saptanmadı. BMI ile memnuniyet düzeyi arasında istatistiksel olarak anlamlı bir ilişki mevcuttu.

Anahtar Kelimeler: Hasta memnuniyeti, Ağrı düzeyi, Prostat biyopsisi, Pozitif tümor patolojisi, Perinöral invazyon.

Cite As: *Türkmen, N., Hacıosmanoglu, T. (2024) What may be Related to Patient Satisfaction in Prostate Biopsies?. Endourol Bull. 2024;16(2):50-57.* https://doi.org/10.54233/endourolbull-1423624

Corresponding Author : *Nihat Türkmen, Huzur Mah. Cumhuriyet ve Demokrasi Cad. No:1 Sarıyer/İstanbul, University of Health Sciences, Sisli Hamidiye Etfal Training and Research Hospital, Urology Department;*
e-mail: *n_turkmen@yahoo.com*
Received : January 23, 2024 ***Accepted*** : May 20, 2024

ABSTRACT

Objective: To investigate the factors affecting patient satisfaction in patients undergoing prostate biopsy.

Material and Methods: Two hundred thirty seven of 241 patients, aged between 48 and 86, those who are decided to undergo transrectal ultrasonography (TRUS)-guided prostate biopsy, were evaluated prospectively. Age, body mass index (BMI), prostate-specific antigen (PSA) values, prostate volume, positive digital rectal examination (DRE) findings and biopsy indications of the patients were recorded before the procedure. The level of pain felt during biopsy was scored by visualised pain scoring (VAS). Patient satisfaction was evaluated with a 4-point scale after biopsy.

Results: Of the 237 patients evaluated, 92 were dissatisfied with the procedure, while 145 were satisfied. The mean age of Group 1 and Group 2 were 65.9±8.1 and 66.1 ± 7.6 years, BMI were 27.7±4.0 and 26.3 ± 3.9 kg/m2, PSA level were 58.6 ± 304.6 and 17.9 ± 68.1 ng/ml, Prostate volume were 59.4 ± 51.8 and 51.8 ± 28.7 cc., The median VAS score was 4 (3-6) and 4 (2.5-6) respectively.

The satisfaction levels of positive DRE findings Group was 3 (2-3) while negative 3 (2-3), Tumor existance Group was 3 (2-3) while no tumor Group's Satisfaction levels 3 (2-3), Perineural invasion of tumor existance Group was 3 (2-3) while other Group's Satisfaction levels 3 (2-3).

Conclusion: In TRUS-guided prostate biopsies, no relationship was found between the patient's satisfaction level and the patient's age, PSA level, prostate volume, the level of pain felt, positive DRE finding, positive Tumor pathology or having perineural invasion of the tumor histologically. There is a statistically significant relationship between BMI and the level of satisfaction.

Keywords: Pain level, Prostate biopsy, Positive tumor pathology, Perineural invasion

INTRODUCTION

Prostate cancer is one of the most commonly diagnosed malignancies in men. It's incidence is increasing annually (1,2). Although it has an insidious onset, it often becomes symptomatic in advanced stages, such us anemia, bone pain, and renal failure due to bilateral ureteral obstruction are some conditions it causes in the advanced stages(1). Other symptoms it may cause are lower urinary tract symptoms (LUTS), such as nocturia and weak urine flow, erectile dysfunction and visible hematuria(3). The symptoms of prostate cancer are not specific to it and might be difficult to discriminate from benign prostate hyperplasia and inflammatory prostate diseases(4). Age, race, positive family history, dietary factors and obesity are some risk factors increasing prostate cancer risk(5).

Prostate-specific antigen (PSA) test, multiparametric magnetic resonance imaging screening and biopsies are utilized in the diagnosis of prostate cancer(1). Although an increased PSA value alone can detect prostate cancer in only 25-30% of cases, prostate cancer is diagnosed in 80% of cases by performing a biopsy after detecting an increased PSA value in the blood(1). An elevated PSA value must be detected in the blood at least twice or a palpable nodule must be detected in a digital rectal examination (DRE) to decide on a biopsy(6). PIRADS scoring system is used to evaluate multi-parametric magnetic resonance imaging (mpMRI) images (7). The location of suspicious tumoral lesions can be determined using mpMRI technology and the PIRADS scoring system (8).

The prostate biopsy is traditionally performed in cases of abnormal DRE, increased blood PSA, and clinical suspicion of prostate cancer, and it can be performed mainly through transrectal and transperineal approaches(9). Although TRUS guided prostate biopsy is the most commonly performed invasive urological procedure, it is considered that gold standard in diagnosis and generally 12 core biopsy samples are obtained during the intervention(10,11). With the development of MRI-guided prostate biopsy technology, it has become frequently practiced to take targeted biopsies from suspicious areas detected by MRI in addition to the standard 12-core biopsy(11).

Although transrectal ultrasonography (TRUS) guided biopsy is generally well tolerated, it can often cause pain and bleeding(12). TRUS-guided biopsy method can sometimes be problematic for patients due to the way it is applied and the fact that it may cause pain. Studies in the literature show that most patients feel discomfort due to pain during TRUS-guided biopsy(13).

Some anesthesia methods are used to reduce the pain felt by patients during TRUS-guided biopsy. The main methods are sedation, periprostatic nerve blockade, and intrarectal lidocaine application(14). Among the anesthesia methods applied before TRUS-guided biopsy, the gold standard is local anesthesia with periprostatic nerve blockade (PPNB) (4). However, Turgut et al. reported that PPNB caused needle-related pain and some other undesirable effects(15). There are some reports that prostate biopsy using intrarectal lidocaine gel does not cause such undesirable effects(16).

It has been shown in the literature that the pain felt during TRUS-guided biopsy is related to the preferred anesthesia method, prostate volume, biopsy sector and PSA level (4,10,13). There are also studies in the literature investigating patient satisfaction with the prostate biopsy procedure(17,18). In our study, in addition to the parameters in the studies in literature, we aimed to investigate the effects of age, BMI, PSA level, the presence of tumor, lymphatic invasion positivity, and VAS score on the level of patient satisfaction who undergo TRUS-guided biopsy.

MATERIAL AND METHODS

The study was designed to be prospective. The sample size was determined using the G-Power 3.1 program. Based on the group averages in the reference studies, a total of 237 patients were planned to be included in the study, with an effect size of 0.37, an α-error rate of 5%, and a study power of 80%.

After approval by the local ethics committee of our hospital (Approval no: 02/05/2023/3914), the study was initiated in accordance with the Declaration of Helsinki. The participants were informed about the study and gave written consent.

Between September 2018 and August 2023, 241 patients aged 48 to 86 years who underwent a TRUS-guided prostate biopsy at the University of Health Sciences, Sisli Hamidiye Etfal Training and Research Hospital, Urology Department were prospectively evaluated in our study. Four patients were excluded from the study because two of them had communication problems during the satisfaction score evaluation, the others had anal fissures and haemorrhoids.

Age, positive DRE findings, PSA values, prostate volume, body mass index and biopsy indications of the patients were recorded before the procedure. Urine culture, bleeding time, prothrombin time, and complete blood count tests were evaluated in all patients before the biopsy. Only patients whose test results were normal underwent the biopsy. Antibiotic prophylaxis and a cleansing rectal enema were given to all patients prior to biopsy, as recommended by guidelines. Lidocaine gel was applied to all patients 10 minutes before the biopsy, and all biopsies were performed by the same urologist. TRUS-guided biopsy was performed using an 18-gauge needle in the lateral decubitus position. No complications required hospitalization developed in any patient. The level of pain felt during the biopsy was evaluated with the Visual Analogue Scoring scale (VAS). Patients were about the intensity of the pain they felt during the biopsy; 0 meant no pain and 10 meant was the worst pain. After biopsy, the patient satisfaction scale was scored on a 4-point scale.

Patients were asked how satisfied they were with the biopsy. In response, they were to choose one of these options; 1-Not satisfied(1 point), 2-Somewhat satisfied(2 points), 3-Satisfied (3 points), 4-Very satisfied(4 points). Group 1 was created from patients who gave 1 and 2 points, and Group 2 was created from patients who gave 3 and 4 points. Variables belonging to the created groups were compared statistically. After the pathological analysis of the biopsy materials, the presence of tumor and perineural invasion were recorded. Two groups created according to patient satisfaction levels were compared using various parameters.

Statistical Analysis

Statistical analysis was performed using SPSS 25 for Windows (IBM, Armonk, NY) software. Descriptive statistics of evaluation results; for categorical variables number and percentage, for numerical variables mean, standard deviation, minimum, maximum, and median values were given. Homogeneous distribution of the data was evaluated by Shapiro-Wilk test. Student's t-test and The Mann–Whitney U test was used for continuous variables according to the normal distribution of the data. The ratio of the categorical variables between the groups was tested by Chi-

square analysis. P-value <0.05 was considered statistically significant.

RESULTS

A total of 237 patients were evaluated. Of these, 92 patients (38.8%) reported dissatisfaction while 145 patients (61.2%) reported satisfaction.

The mean age was 66.0 ± 7.8 (year). The median BMI was 26.9 ± 4.0 (kg/m$^{2)}$. The median PSA level and prostate volume of these patients were 33.7 ± 197.5 ng/mL and 54.8 ± 39.3 cc respectively (Table 1). Seventy-six of 237 patients(%32.1) had positive DRE findings and 75 (% 31.6) had tumor existence in the pathology results. Thirty-nine of 79 tumor positive patients(%52.0) had perineural invasion (Table 1).

Table 1. Evaluation of demographic and clinical variables of the patients (n=237)

Variables	n (%)	Median (IQR)	Mean ± SD
Age (Year)			66.0 ± 7.8
***BMI (kg/m²)**		26.8 (24.4-29.4)	
***PSA level (ng/dl)**		6.9 (5.1-10.4)	
Prostate volume (cc)		45.0 (33.0-63.0)	
***Positive DRE finding**	76(%32.1)		
Tumor existance	75(%31.6)		
***Positive perineural invasion in patients with Pca**	39(%52.0)		

*BMI: Body mass index
*PSA: Prostate specific antigen
*DRE: Digital rectal examination
*Pca: Prostate cancer

The mean age of Group 1 and Group 2 were 65.9±8.1 and 66.1 ± 7.6 years respectively. There was no statistically significant difference between the two groups(P=0.858) (Table 2). The median BMI of Group 1 and Group 2 were 27.7±4.0 and 26.3 ± 3.9 kg/m^2 respectively. BMI rate of Group 1 found to be statistically significantly higher than Group 2 (P = 0.011) (Table 2). The median PSA level of Group 1 and Group 2 were 58.6 ± 304.6 and 17.9 ± 68.1 ng/ml respectively. There was difference between in two groups but it was not statistically significantly differance (P=0.210) (Table 2). The median Prostate volume of Group 1 and Group 2 were 59.4 ± 51.8 and 51.8 ± 28.7 cc respectively. There was difference between in two groups but it was not statistically significantly differance(P=0.209)(Table 2). The median VAS score of Group 1 and Group 2 were 4 (3-6) and 4 (2.5-6) respectively. There was no statistically significant difference between in two groups (P=0.957) (Table 2).

Table 2. Evaluation of the patients characteristics according to satisfaction levels

Variables		Group 1(Not Satisfied)	Group 2(Satisfied)	P value
Age (years),	mean±SD	65.9±8.1	66.1 ± 7.6	0.858^t
BMI (kg/m²),	median (IQR)	27.4 (24.8-29.4)	26.4 (23.9-28.7)	**0.032^m**
PSA level (ng/ml),	median (IQR)	6.4 (4.8-9.4)	7.2 (5.1-11.1)	0.273^m
Prostate Vol.(cc),	median (IQR)	44.0 (340-67.5)	45.0 (33.0-60.0)	0.720^m
VAS score,	median (IQR)	4 (3-6)	4 (2.5-6)	0.957^m

BMI: Body mass index; PSA: Prostate-specific antigen; VAS: Visual analogue scale;
^{m} Mann-Whitney U test; ^{t} Student's t-test

Table 3. Comparison of satisfactory levels among patients according to different groups

Variables	Satisfaction levels, median (IQR)	P value
***DRE findings**		
Yes	3 (2-3)	0.965
No	3 (2-3)	
Tumor existance		
Yes	3 (2-3)	0.368
No	3 (2-3)	
Perineural invasion		
Yes	3 (2-3)	0.439
No	3 (2-3)	

*DRE: Digital Rectal Examination

The Satisfaction levels of positive DRE findings Group was 3 (2-3) while negative DRE findings Group 3 (2-3). There was no statistically significant difference between in two groups (P=0.965). The Satisfaction levels of tumor existance Group was 3 (2-3) while other Group's Satisfaction levels 3 (2-3). There was no statistically significant difference between in two groups (P=0.368). The Satisfaction levels of Perineural invasion of tumor existance Group was 3 (2-3) while other Group's Satisfaction levels 3 (2-3). There was no statistically significant difference between in two groups (P=0.439) (Table 3).

DISCUSSION

In addition to showing the quality of the healthcare service provided, patient satisfaction is also important in terms of accepting the patient's re-biopsy procedure and surgical treatment alternatives. In our study, we investigated whether there was a relationship between various parameters and patient satisfaction.

In a retrospective study of 100 patients conducted by Peters JL et al., they investigated the satisfaction levels of those who were sedated and those who were not sedated during transrectal biopsy, and they obtained a higher satisfaction score in those who were sedated (17). Awsare et al.in their study reported The use of propofol sedation for transrectal ultrasonography-guided prostate biopsy is associated with high patient satisfaction and acceptability (18).

Hossack et al., in their study with 476 patients, found that age was an effective factor in not accepting re-biopsy under local anesthesia. However, no difference was found between races. In our study, no significant difference was found between the patient satisfaction levels of two groups with different ages (19).

Again, in the same study, the difference in PSA level between the groups that could not tolerate local anesthesia and those that did was not found to be significant. In our study, no statistically significant difference was found between PSA groups in terms of satisfaction.(19). In the same study, it was concluded that patients with high VAS scores would significantly prefer General Anesthesia in case of re-biopsy compared to those with low VAS scores. One of the factors that can affect patient satisfaction is pain. Pain is an unwanted feeling. The main goal is to ensure that the patient does not feel as much pain as possible during the biopsy. In our study, no significant difference was found between the satisfied and unsatisfied groups in terms of VAS score (19).

In a study conducted by Yun et al. consisting of 71 patients, it was revealed that more pain was felt in patients with larger prostate size. In our study, no difference was found between the satisfaction levels of the two groups with prostate volumes below and above the average (20). Skyring at al. in their study involving 151 prostate cancer patients, regret about the treatment was found to be inversely proportional to the satisfaction felt in the decision-making process. If the patient was satisfied, regret about continuing the treatment process decreased (21). In a retrospective study by Hong et al. involving 1162 patients, penis size was found to be increased in those with low BMI and large nasal size (22). The study by Udo et al. showed that there was no correlation between Prostate Volume and BMI in

black population (23). In our study, a higher satisfaction rate was observed in those with low BMI compared to those with high BMI.

Up to date many studies have been conducted examining the relationship between patient satisfaction and acceptance of the treatment given, decision to continue the treatment, trust and loyalty to the health institution providing the service. However, there is no study in the literature examining the relationship between age, prostate volume, BMI, VAS score, presence of tumor, presence of lymphatic invasion in the presence of tumor, DRE positivity and patient satisfaction in TRUS-guided prostate biopsies. This study will be the first in the literature.

Satisfaction perception differs according to individuals. This is a limitation for this study. In future studies, the relationship between parameters and satisfaction levels can be investigated by using different anesthesia methods. It is useful to conduct new studies focusing on patient satisfaction in urological practices.

CONCLUSION

In TRUS-guided prostate biopsies, no relationship was found between the patient's satisfaction level and the patient's age, serum PSA level, prostate volume, the level of pain felt, having a positive tumor finding during the diagnosis of the tumor, detecting the presence of tumor in histological examination, or having perineural invasion of the tumor histologically, while BMI and it was determined between the satisfaction level. As the patient's BMI increases, the level of satisfaction with the procedure decreases.

Funding: None.

Conflict of Interest: The author declare there is no con'ict of interest.

Ethics Committe: Istanbul Sisli Hamidiye Etfal Training and Research Hospital Ethics Committee. Date number: 02.05.2023 Protocol: 3914.

REFERENCES

1. Leslie, S. W., Soon-Sutton, T. L., R I, A., Sajjad, H., & Siref, L. E. (2023). Prostate Cancer. In StatPearls. StatPearls Publishing.
2. Zhang, Y., Yuan, Q., Muzzammil, H. M., Gao, G., & Xu, Y. (2023). Image-guided prostate biopsy robots: A review. Mathematical biosciences and engineering: MBE. 20(8):15135-15166. https://doi.org/10.3934/mbe.2023678
3. Merriel SWD, Funston G, Hamilton W. Prostate Cancer in Primary Care. Adv Ther. 2018;35(9):1285-1294. https://doi.org/10.1007/s12325-018-0766-1.
4. Rempega G, Rajwa P, Kępiński M, Ryszawy J, Wojnarowicz J, Kowalik M, Krzempek M, Krzywon A, Dobrakowski M, Paradysz A, Bryniarski P. The Severity of Pain in Prostate Biopsy Depends on the Biopsy Sector. J Pers Med. 2023 Feb 27;13(3):431. https://doi.org/10.3390/jpm13030431.
5. Pienta KJ, Esper PS. Risk factors for prostate cancer. Ann Intern Med. 1993 May 15;118(10):793-803. https://doi.org/10.7326/0003-4819-118-10-199305150-00007.
6. Cuzick J, Thorat MA, Andriole G, Brawley OW, Brown PH, Culig Z, Eeles RA, Ford LG, Hamdy FC, Holmberg L, Ilic D, Key TJ, La Vecchia C, Lilja H, Marberger M, Meyskens FL, Minasian LM, Parker C, Parnes HL, Perner S, Rittenhouse H, Schalken J, Schmid HP, Schmitz-Dräger BJ, Schröder FH, Stenzl A, Tombal B, Wilt TJ, Wolk A. Prevention and early detection of prostate cancer. Lancet Oncol. 2014;15(11):e484-92. https://doi.org/10.1016/S1470-2045(14)70211-6. PMID: 25281467; PMCID: PMC4203149.
7. Weinreb JC, Barentsz JO, Choyke PL, Cornud F, Haider MA, Macura KJ, Margolis D, Schnall MD, Shtern F, Tempany CM, Thoeny HC, Verma S. PI-RADS Prostate Imaging - Reporting and Data System: 2015, Version 2. Eur Urol.

2016;69(1):16-40. https://doi.org/10.1016/j.eururo.2015.08.052.

8. Eldred-Evans D, Burak P, Connor MJ, Day E, Evans M, Fiorentino F, Gammon M, Hosking-Jervis F, Klimowska-Nassar N, McGuire W, Padhani AR, Prevost AT, Price D, Sokhi H, Tam H, Winkler M, Ahmed HU. Population-Based Prostate Cancer Screening With Magnetic Resonance Imaging or Ultrasonography: The IP1-PROSTAGRAM Study. JAMA Oncol. 2021 Mar 1;7(3):395-402. https://doi.org/10.1001/jamaoncol.2020.7456.
9. Streicher, J., Meyerson, B. L., Karivedu, V., & Sidana, A. (2019). A review of optimal prostate biopsy: indications and techniques. *Therapeutic advances in urology*, *11*, 1756287219870074. https://doi.org/10.1177/1756287219870074
10. Ozah E, Ezenwa EV, Agbugui JO, Osaigbovo EO. Transrectal ultrasound guided prostate biopsy in university of Benin teaching hospital: effect of prostate volume on pain amongst Nigerian patients. Am J Clin Exp Urol. 2021 Feb 15;9(1):157-162. PMID: 33816704; PMCID: PMC8012828.
11. Mate K, Nedjim S, Bellucci S, Boucault C, Ghaffar N, Constantini T, Marvanykovi F, Vestris PG, Sadreux Y, Laguerre M, Stempfer G, Blanchet P, Istvan B, Brureau L. Prostate biopsy approach and complication rates. Oncol Lett. 2023 Jul 17;26(3):375. https://doi.org/10.3892/ol.2023.13959.
12. Loeb S, Vellekoop A, Ahmed HU, Catto J, Emberton M, Nam R, Rosario DJ, Scattoni V, Lotan Y. Systematic review of complications of prostate biopsy. Eur Urol. 2013;64(6):876-92. https://doi.org/10.1016/j.eururo.2013.05.049.
13. Rodriguez, A., Kyriakou, G., Leray, E., Lobel, B., & Guillé, F. Prospective study comparing two methods of anaesthesia for prostate biopsies: apex periprostatic nerve block versus intrarectal lidocaine gel: review of the literature. *European urology*, 2003;*44*(2):95-200. https://doi.org/10.1016/s0302-2838(03)00188-x
14. Akduman B, Crawford E. Transrectal ultrasound-guided prostate biopsy: Current approach. Türk Üroloji Dergisi/ Turkish Journal of Urology, 2010;36(1):25-32.
15. Turgut AT, Olçücüoğlu E, Koşar P, Geyik PO, Koşar U. Complications and limitations related to periprostatic local anesthesia before TRUS-guided prostate biopsy. J Clin Ultrasound. 2008;36(2):67-71. https://doi.org/10.1002/jcu.20424.
16. Alvarez-Múgica M, González Alvarez RC, Jalón Monzón A, Fernández Gómez JM, Rodríguez Faba O, Rodríguez Robles L, Regadera Sejas FJ. Tolerancia y complicaciones de las biopsias prostaticas ecodirigidas mediante el uso de un gel intrarectal con lidocaina [Tolerability and complications of ultrasound guided prostate biopsies with intrarectal lidocaine gel]. Arch Esp Urol. 2007;60(3):237-44. Spanish. https://doi.org/10.4321/s0004-06142007000300003.
17. Peters JL, Thompson AC, McNicholas TA, Hines JE, Hanbury DC, Boustead GB. Increased patient satisfaction from transrectal ultrasonography and biopsy under sedation. BJU Int. 2001;87(9):827-30. https://doi.org/10.1046/j.1464-410x.2001.02221.x.
18. Awsare NS, Green JA, Aldwinckle B, Hanbury DC, Boustead GB, McNicholas TA. The use of propofol sedation for transrectal ultrasonography-guided prostate biopsy is associated with high patient satisfaction and acceptability. Eur J Radiol. 2007;63(1):94-5. https://doi.org/10.1016/j.ejrad.2006.12.010.
19. Hossack T, Woo HH. Acceptance of repeat transrectal ultrasonography guided prostate biopsies with local anaesthesia. *BJU Int*. 2011;107 Suppl 3:38-42. https://doi.org/10.1111/j.1464-410X.2011.10048.x
20. Yun TJ, Lee HJ, Kim SH, Lee SE, Byun SS, Hong SK, Cho JY, Seong CK. Prospective analysis on the relation between pain and prostate volume during transrectal prostate biopsy. Korean J Radiol. 2007 May-Jun;8(3):231-5. https://doi.org/10.3348/kjr.2007.8.3.231.
21. Skyring TA, Mansfield KJ, Mullan JR. Factors Affecting Satisfaction with the Decision-Making Process and Decision Regret for Men with a New Diagnosis of Prostate Cancer. Am J Mens Health. 2021;15(4):15579883211026812. https://doi.org/10.1177/15579883211026812.
22. Hong S, Choi W, Lee KW, Lee YT, Kwon T. Penile length and circumference: are they related to nose size? Transl Androl Urol. 2023 May 31;12(5):708-714. https://doi.org/10.21037/tau-22-869.

23. Udo CO, Robinson ED, Ijeruh OY, Nwankwo NC. Correlation between Transabdominal Sonographic Prostate Volume and Anthropometric Parameters. J Med Ultrasound. 2022 May 19;30(4):261-265. https://doi.org/10.4103/jmu.jmu_183_21.

Original Article
Özgün Araştırma

Endourol Bull. 2024;16(2):58-63. doi: 10.54233/endourolbull-1442984

Approach to Forgotten Ureteral Stents: A Single Tertiary Center Experience of 49 Cases

Unutulmuş Üreteral Stentlere Yaklaşım: 49 vakalık Üçüncü Basamak Tek Merkez Deneyimi

Cengiz Çanakcı [1], Erdinç Dinçer [1], Burak Doğrusever [1], Mahmut Selman Mert [1], Orkunt Özkaptan [1]

[1] *Department of Urology, University of Health Sciencies, Kartal Dr. Lutfi Kirdar City Hospital, Istanbul, Türkiye*

ÖZET

Amaç: Double J (DJ) stentler üroloji pratiğinde sıklıkla kullanılmaktadır. Çıkarılması unutulan DJ stentler ciddi komplikasyonlara neden olabilir. Bu çalışmada kliniğimizde opere edilen 49 unutulmuş üreteral stent vakalarıyla ilgili deneyimlerimizi paylaşmayı amaçladık.

Gereç ve Yöntemler: Kliniğimizde 2013-2023 yılları arasında unutulmuş üreteral stent nedeniyle opere edilen hastaların verileri retrospektif olarak toplandı. Yaş, cinsiyet, taraf, başvuru şikayeti, stent kalış süresi, stent endikasyonu, uygulanan cerrahi, komplikasyon, ek girişim ve taşsızlık durumu kaydedildi.

Bulgular: Unutulmuş stent nedeniyle opere edilen 49 hastanın 19'u (%38,8) kadın, 30'u (%61,2) erkekti. Hastaların ortalama yaşı 47,06±14,11 (min:18/max:79) idi. Ortalama stent kalış süresi 16,2±21,1 (min:3/max:120) aydı. Otuz hastaya taş cerrahisi nedeniyle stent takılırken, 9 hastaya profilaktik, iki hastaya üreter yaralanması ve 8 hastaya da hidronefroz nedeniyle takılmıştı. Hastaların 9'una sistolitotripsi, 26'sına üreteroskopi (flexible üreterorenoskopi dahil), birine perkütan nefrolitotomi, 11'ine endoskopik kombine tedavi, ikisine ise açık cerrahi uygulandı.

Sonuç: Unutulmuş üreteral stentler ciddi komplikasyonlara neden olabilmektedir. DJ stent takılan hastalar unutulmuş stentlere bağlı komplikasyonlar hakkında bilgilendirilmelidir.

Anahtar Kelimeler: Üreteral kateter, unutulmuş DJ, taşlaşma, stent kalış süresi

Cite As: *Çanakcı, C., Dinçer, E., Doğrusever, B., Mert, M.S., Özkaptan, O. (2024) Approach to Forgotten Ureteral Stents: A Single Tertiary Center Experience of 49 Cases. Endourol Bull. 2024;16(2):58-63.* https://doi.org/10.54233/endourolbull-1442984

Corresponding Author : Cengiz Çanakci, Kartal Dr. Lütfi Kırdar City Hospital D100 Güney Yanyol Cevizli 34890 Kartal / İstanbul / Türkiye
e-mail: cengizcanakci@hotmail.com
Received : February 26, 2024 ***Accepted*** : May 20, 2024

ABSTRACT

Objective: Double J (DJ) stents are widely used in urology practice. Forgotten ureteral stents can cause serious complications. We present our experience about forgotten ureteral stents with 49 cases.

Material and Methods: The data of patients who were operated due to forgotten encrusted ureteral stents were examined retrospectively. Age, gender, side, presenting complaint, indwelling time, stent indication, surgery performed, complications, additional interventions and stone-free status were evaluated. For descriptive statistics, the mean, standard deviation, minimum and maximum frequencies and percentages were used.

Results: Nineteen (38.8%) patients were female and 30 (61.2%) patients were male. The mean age of the patients was 47,06±14,11 (18-79). The mean indwelling time was 16.2±21,1 (3-120). Stents were placed in 30 patients due to stone surgery, 9 patients due to prophylactic before oncologic surgery, 8 patients due to hydronephrosis and two patients due to ureteral injury. For the treatment of the forgotten stent, ureteroscopy (including flexible ureterorenoscopy) was performed in 26 patients, endoscopic combined treatment in 11 patients, cystolithotripsy in 9 patients, open surgery in two patients and percutaneous nephrolithotomy in one patient.

Conclusion: Removal of forgotten impacted ureteral stents can cause serious complications. The patients who were placed stents should be informed about the complications associated with forgotten encrusted stents.

Keywords: Ureteral Stents, Forgotten DJ, Encrustation, Indwelling Time

INTRODUCTION

Ureteral stents were first used in 1967 and have become an indispensable part of many urological surgeries (1). Besides being used for decompression of obstruction, it can also be used in stone surgery, ureteral injuries and even for comlicated obstretric or colorectal surgeries prophylactically (2). In recent years new stent types have been designed with significant technological innovations and developments to increase patient tolerance and overcome stent-related problems. However, symptoms and complications related to ureteral stents cannot be prevented (3). Although forgotten dj stents are sometimes asymptomatic, they can cause various complications such as hematuria, obstruction, infection, migration, encrustation, kidney failure, sepsis and even death (4,5).

Treatment of forgotten dj stents can sometimes be difficult and complicated for urologist depending on the degree of encrustation and the complications (1,6). Percutaneous nephrolithotomy (PCNL), ureteroscopy (URS), retrograde intrarenal surgery (RIRS), transuretral cystolithotripsy and the combine surgeries can be used for removal of encrusted stents. Secondary surgical intervention may be required depending on the location and degree of encrustation (7). In the current study, we aimed to describe the types of treatments applied to patients with forgotten ureteral stents, the complications and results in a tertiary care center.

MATERIAL AND METHODS

Data of 49 patients who underwent surgery due to forgotten ureteral stent (>3 months) between January 2013 and January 2023 were examined retrospectively. This study was conducted in accordance with the Declaration of Helsinki (193/2013), approved by our Institutional Review Board (2023/514/262/5). The patients' age, gender, side, medical and surgical history, indwelling time of stent, present complaint, indication of indwelling stent, complications, and stone-free status were evaluated. Stent indwelling time was calculated as the time between stent placement and removal. All patients' complete blood count (CBC), creatinine and midstream urine culture were evaluated. Patients with positive urine culture were treated with antibiotics preoperatively and negative urine cultures were obtained in all patients before surgery.

Encrustation was comfirmed with kidney-ureter-bladder graphy (KUB) and non-contrast computed tomography (CT). Tc99m dimerkaptosuccinic acid (DMSA) was performed to evaluate renal function in patients with several parenchymal damage. Treatment decision were based on the degree and location of encrustation. Ureteroscopic lithotripsy, RIRS, cystolithotripsy, PCNL, open surgery and endoscopic combine surgeries was performed for removal of stents.

The postoperative outcomes including fever, hospitalization time, transfusion rates, kidney function tests and complications were recorded. Postoperative complications were evaluted based on Clavien-Dindo Classification. Postoperative stone-free status were confirmed by KUB and CT. For descriptive statistics, the mean, standard deviation, minimum and maximum frequencies and percentages were used. Statistical analyses were performed using SPSS 26.0.

RESULTS

Nineteen (38.8%) female and 30 (61.2%) male had undergone surgery due to forgotten ureteral stents. The mean age was 47.06±14.11(18-79). The present symptoms are given in Table 1. The mean indwelling time of stents was 16.2±21.1(3-120). Stents were placed in 30 patients due to stone surgery, 9 patients due to prophylactic before oncologic surgery, two patients due to ureteral injury and 8 patients due to hydronephrosis. It was observed that the stent which was placed 60 months ago due to ureteral injury during hysterectomy was broken into three pieces. For the treatment of the forgotten encrusted stent, cystolithotipsy was performed in 9 patients, ureteroscopy (including flexible ureterorenoscopy) in 26 patients, percutaneous nephrolithotomy in one patient, endoscopic combined treatment in 11 patients, and open surgery in two patients.

Mean KUB score was 8.14±3.59. In 7 of 19 patients with a KUB score ≥9 auxillary intervention was essential. Endoscopic combine surgery was performed in 3, PNL in one, and URS in three patients. Stone freeness was achieved in three of the seven patients. Clinically significant resudial fragments (>4 mm) was recorded in 7 (15%) patients. Postoperative fever was observed in 12 (24%) patients (grade 1). Blood transfusion or antibiotic treatment were required in four patients (grade 2). Dj stent was placed in one patient (grade 3a) and acute kidney failure was detected in two patients (grade 4a). A total of three patients requiring urosepsis were treated in intensive care (Table-2).

Table 1. Presantation symptoms

Symptoms	Number of cases (%)
Irritative voiding symptoms	15 (30)
Hematuria	8 (16)
Infection	9 (18)
Abdominal-Lomber pain	18 (36)
Renal failure	3 (6)
Incontinence	2 (4)
No symptoms	8 (16)

Table 2. Demographic and peroperative data

Age	47.06±14.11 (min-18/max-79)	
Gender- Female/Male	19/30	
Laterality- Right-Left	22/27	
Stent indication	Stone surgery- 30 Profilactic- 9 Ureteral injury- 2 Hydronephrosis- 8	
İndwelling time	16.2±21.1 (min-3/max-120)	
KUB Score	9≤ 17 9≥32	8.14±3.59
Preoperative infection treatment	23/49 (%46)	

Complication/Clavien-Dindo (%)	
Grade 1(Fever)	12 (24)
Grade 2 (Blood transfusion, antibiotics)	4 (8)
Grade 3a (Dj stent insertion under local anesthesia)	1 (2)
3b (Intervention under general anesthesia)	0
Grade 4a (Acute kidney failure)	1 (2)
4b (Intensive care unit)	3 (6)
Grade 5 (Death)	0
Auxiliary surgery	7/49 (%14)
Stone-free	42/49 (%85)

Table 3. Methods of treatment

Treatment	Number of cases
Cystolithotripsy	9
Ureteroscopy	26
Percutaneous nephrolithotomy	1
Endoscopic combine surgery	11
Open surgery	2

DISCUSSION

Dj stents are widely used in endourology. Urolithiasis is endemic in our region, and due to the increasing rate of endourological surgery, the rate of forgotten stents is also increasing. It may occur due to the patient negligence or inadequate clinician-patient communication (5,8).

Although patients are sometimes asymptomatic, it can cause irritative symptoms, hematuria, urinary tract infection, ureteral obstruction and renal failure (9). Irritative symptoms of forgotten stents were reported as 19-42% in some studies. In our study, presence of irritative symptoms were found 30%. Another common symptom was lomber pain and it was reported as 19-32% in literature (10). However, we found this ratio as 36% in our study. As stent indwelling time increased, complication rates also increased. Stent migration and spontaneous disintegration are seen rarely (11). We determined spontaneous stent disingtegration in only 1 patient who had a stent placed due to ureteral injury during histerectomy.

Removal of forgotten stents can be a hard challenge due to encrustation and stone formation. El-Faqih et al. found that encrustation rate was 9.2% when stent indwelling time was less than 6 weeks. They also reported that the rate could increase up to 47.5% when the time was between 6-12 weeks and up to 76.3% when the time longer than 12 weeks (12). The most important factor for encrustation and stone formation is stent indwelling time. Beside that, the quality of stent material, infection, patients with high risk factors for urolithiasis and pregnancy are also other risk factors (13).

There are various treatment options for forgotten encrusted ureteral stents. Extracorporeal shock wave lithotripsy can only be used for encrustation located in the upper 1/3 of the stent. When the encrustation is located only in the bladder, cystolithotripsy can be a good choice for treatment. Encrustations in ureter can be fragmantated with a laser lithotripter. In case of stone burden in renal pelvis, it can be treated by RIRS or PCNL. Endoscopic combined intrarenal surgery (ECIRS) may be preferred in cases of high encrustation and stone burden in the ureter and renal part (6,10). Today, although the rates of endourological approaches have increased, open surgery is still a good option in difficult

cases (1). In our clinic, minimally invasive methods are primarily used but in the present study, open surgery was performed in 2 patients due to serious stone burden in bladder.

Various scoring systems have been defined to grade stent encrustation. Miranda et al. defined Forgotten-Encrusted-Calcified System (FECal) which is a 5-stage classification extending from minimal encrustation of the coil parts of the stent to encrustation of the entire stent. In FECal, a treatment algorithm has been defined according to degree of encrustation (3). In Visual Grading for Ureteral Encrusted Stent (V-GUES), gradings are defined from A to D according to severity of encrustation. Type D is associated with low stone-free rates and multiple interventations (14). Arenas et al. defined a 15-point scoring system called Kidney-Ureter-Bladder (KUB). In this scoring system, scoring is based on the location and the degree of encrustation. It was reported that KUB score above 9 was associated with multiple interventations, mean operation time over 180 minutes and low stone-free rates. The need for auxiliary interventions was 4 fold higher for patients with >9 KUB scores (7). In our study 7 of 19 patients (36%) required auxillary intervention. These classification systems may be useful in informing patients preoperatively.

Another serious complication of removing forgotten stents is sepsis. Weedin et al. reported that positive midstream urine culture rates was 75.2% and 13% of the patients admitted to clinics because urinary infection or sepsis (15). Infective obstructive hydronephrosis can be occured due to encrusted stents. Sepsis can be seen despite antibiotic treatments before the surgery. Examination of stent culture may be an important parameter in the treatment of sepsis that may occur postoperatively. In our study, preoperative positive midstream urine culture was found to be 46%. Postoperative fever was seen 24% of the patients despite appropriate antibiotic treatment and negative urine culture before the surgery. Three patients required intensive care for multiple organ failure due to urosepsis.

We have some limitations in this study. First, the nature of study is retrospective. Second limitation is the small number of patients. The surgical interventions were performed by different urologists. There is not enough data about long-term follow-up of patients, renal functions and long term complications.

CONCLUSION

Forgotten ureteral stents can cause serious morbidities. Combined treatments or multiple interventions may be required to remove forgotten stents. Patients should be carefully informed about the stent in the postoperative period, and the complications that the stent may cause in the long term should be explained.

Financial Disclosure: The authors declared that this study has received no financial support.

Ethics Committe: Dr. Lütfi Kırdar Kartal City Hospital Clinical Trials Ethics Committee Date Protocol: 2023/514/262/5.

Conflict of Interest: The authors certify that there is no conflict of interest with any financial organization regarding the material discussed in the manuscript.

Funding / support: The authors report no involvement in the research by the sponsor that could have influenced the outcome of this work.

REFERENCES

1. Al-Hajjaj M, Alam OA, Abu-Hussein B, Al Husein HM. Forgotten Double-J ureteral stent: An analysis of 25 cases in a tertiary hospital. Ann Med Surg (Lond) 2022;31:80:104223. https://doi.org/10.1016/j.amsu.2022.104223.
2. Adanur S, Ozkaya F. Challenges in treatment and diagnosis of forgotten/encrusted double-J ureteral stents: the largest single-center experience. Ren Fail 2016;38:920-6. https://doi.org/10.3109/0886022X.2016.1172928.
3. Miranda AMA, Milner J, Turk TMT. The FECal Double-J: a simplified approach in the management of encrusted and retained ureteral stents. J Endourol 2009;23:409-15. https://doi.org/10.1089/end.2008.0214.

4. Mulay A, Kapoor R, Sharma S, Asabe S, Belagali H, et al. Strategy to track double-J stents placed during COVID-19 using smartphone-based stent tracker application to prevent forgotten double-J stent in a high-volume centre: a smart solution. Afr J Urol 2021;27:110. https://doi.org/10.1186/s12301-021-00212-3.

5. Sohrab A, Aneesh S, Sureka SK, Varun M, Nitesh P, et al. Forgotten Reminders: an Experience with Managing 28 Forgotten Double-J Stents and Management of Related Complications. Indian J Surg 2015;77:1165-71. https://doi.org/10.1007/s12262-015-1229-4.

6. Jones PJ, Pietropaolo A, Æsøy MS, Ulvik O, Beisland C, et al. Endourological management of encrusted ureteral stents: an up-to-date guide and treatment algorithm on behalf of the European Association of Urology Young Academic Urology Urolithiasis Group. Cent European J Urol 2021;74:571-578. https://doi.org/10.5173/ceju.2021.0264.

7. Arenas JL, Shen JK, Keheila M, Abourbih SR, Lee A, et al. Kidney, Ureter, and Bladder (KUB): A Novel Grading System for Encrusted Ureteral Stents. Urology 2016;97:51-55. https://doi.org/10.1016/j.urology.2016.06.050.

8. El-Tatawy H, El-Abd AS, Gameel TA, Ramadan AR, Farha MOA, et al. Management of 'forgotten' encrusted JJ stents using extracorporeal shockwave lithotripsy: A single-centre experience. Arab J Urol 2019;17:132-137. https://doi.org/10.1080/2090598X.2019.1595485.

9. Singh V, Srinivastava A, Kapoor R, Kumar A. Can the complicated forgotten indwelling ureteric stents be lethal? Int Urol Nephrol. 2005;37:541–546. https://doi.org/10.1007/s11255-004-4704-6.

10. Geavlete P, Georgescu D, Mulțescu R, Stanescu F, Cozma C, et al. Ureteral stent complications - experience on 50,000 procedures. J Med Life 2021;14:769-775. https://doi.org/10.25122/jml-2021-0352.

11. Soyupek S, Oksay T, Kosar A. Fragmentation of a forgotten double J stent and excreted with urine: case report. Int Urol Nephrol 2003;35:91–2. https://doi.org/10.1023/a:1025966110195.

12. El-Faqih SR, Shamsuddin AB, Chakrabarti A, Atassi R, Kardar AH, et al. Polyurethane internal ureteral stents in treatment of stone patients: morbidity related to indwelling times. J Urol 1991;146:1487-91. https://doi.org/10.1016/s0022-5347(17)38146-6.

13. Cicione A, Stira J, Tema G, Franco A, Ghezzo N, et al. Ureteral stent encrustation: evaluation of available scores as predictors of a complex surgery. Minerva Urol Nephrol 2023;75:359-365. https://doi.org/10.23736/S2724-6051.22.04999-0.

14. Manzo BO, Alarcon P, Lozada E, Ojeda J, Morales C, et al. A Novel Visual Grading for Ureteral Encrusted Stent Classification to Help Decide the Endourologic Treatment. J Endourol 2021;35:1314–9. https://doi.org/10.1089/end.2020.1225.

15. Weedin JW, Coburn M, Link RE. The impact of proximal stone burden on the management of encrusted and retained ureteral stents. J Urol 2011;185(2):542-7. https://doi.org/10.1016/j.juro.2010.09.085.

Original Article
Özgün Araştırma

Endourol Bull. 2024;16(2):64-69. doi: 10.54233/endourolbull-1471001

Evaluation of the Use of Long Term DJ Stents in Ureteral Obstructions That Cannot Be Treated Curatively

Küratif Tedavi Yapılamayan Üreteral Obstrüksiyonlarda Uzun Ömürlü DJ Stent Kullanımının Değerlendirilmesi

Özgür Arıkan[1], İlkin Hamid-zada[1], Ferhat Keser[2], Mustafa Kaan Akalın[1], Özgür Efiloğlu[1], Asıf Yıldırım[1]

[1] Göztepe Prof. Dr. Süleyman Yalçın Şehir Hastanesi, İstanbul Medeniyet Üniversitesi, Üroloji Kliniği, İstanbul, Türkiye
[2] Sancaktepe Şehit Prof.Dr. İlhan Varank Eğitim Ve Araştırma Hastanesi, Üroloji Kliniği, İstanbul, Türkiye

ÖZET

Amaç: Üreteral obstrüksiyon intrensek veya ekstrensek ayrıca benign veya malign etyolojiye bağlı olarak gelişebilmekte ve renal fonksiyon kaybına, ağrı ve nüks üriner sistem enfeksiyonlarına sebep olabilmektedir. Etyolojiye yönelik küratif cerrahi tedaviler her zaman mümkün olmamaktadır. Bu çalışmada üreteral obstrüksiyonu olan ancak küratif cerrahi yapılamayan hastalarda uzun ömürlü DJ stent kullanımının etkinliğini ve güvenilirliğini araştırmayı amaçladık.

Gereç ve Yöntemler: İstanbul Medeniyet Üniversitesi Göztepe Prof. Dr. Süleyman Yalçın Şehir Hastanesi Üroloji Kliniği'nde 2015-2022 yılları arasında üreteral obstrüksiyon nedeniyle uzun ömürlü DJ stent uygulaması yapılan ve bu şekilde takip edilen 131 hasta retrospektif olarak değerlendirildi. Hastaların demografik verileri, üreteral obstrüksiyon etyolojisi, takip süresi ve komplikasyonları kaydedildi. Hastalara 4,8F-26cm, Boston Percuflex™Plus üreteral stent kullanıldı ve yılda bir kez değiştirilmesi planlandı.

Bulgular: Çalışmaya dahil edilen 131 hastanın 40'ında (%30,53) malign üreteral obstrüksiyon, 91'inde (%69,47) ise benign üreteral obstrüksiyon mevcuttu. Ortalama takip süresi 35,4 ay olarak bulundu. Takipleri süresince 18 (%13,74) hastada stent ilişkili ağrı, dizüri gibi semptomlar, 11 (%8,39) hastada tekrarlayan üriner sistem enfeksiyonu, 8 (%6,1) hastada enkruste DJ stent, 3 (%2,29) hastada DJ stent migrasyonu ve 1 (%0,76) hastada ise kan transfüzyonu gerektiren hematüri geliştiği görülmüştür.

Sonuç: Çalışmamızda gösterilmiştir ki, uzun ömürlü üreteral DJ stent kullanımı, malign ve benign üreteral obstrüksiyonlarda güvenilir ve etkin bir seçenektir.

Anahtar Kelimeler: Üreteral obstrüksiyon, Uzun ömürlü DJ stent, Küratif cerrahi

Cite As: *Arikan, O., Hamid-zada, I., Keser, F., Akalın, M.K., Efiloglu, O., Yildirim, A. (2024) Evaluation of the Use of Long Term DJ Stents in Ureteral Obstructions That Cannot Be Treated Curatively. Endourol Bull. 2024;16(2):64-69.* https://doi.org/10.54233/endourolbull-1471001

Corresponding Author : Ilkin Hamid-zada, MD, Department of Urology, Istanbul Medeniyet University, Istanbul, Türkiye.
Address: Egitim Mahallesi, Dr. Erkin Cd., 34722 Kadıkoy/Istanbul
e-mail: ilkin081994@gmail.com
Received : April 19, 2024 ***Accepted*** : May 26, 2024

ABSTRACT

Objective: Ureteral obstructions may develop due to intrinsic or extrinsic, benign or malignant etiology and may cause loss of renal function, pain and recurrent urinary system diseases. Curative treatments for etiology are not always possible. We aimed to evaluate the clearance and salvage of this long term DJ stent, which has ureteral obstruction but can not be performed with curative surgery.

Material and Methods: One hundred and thirty-one patients who underwent long term DJ stent application due to ureteral obstruction between 2015 and 2022 were followed up and evaluated retrospectively. Demographic data of the patients, ureteral obstruction etiology, follow-up period and complications were recorded. The 4.8F-26cm, Boston Percuflex™Plus Ureteral Stent was used in the patients and was planned to be replaced once a year.

Results: Of the 131 patients included in this study, 40 (30.53%) had malignant ureteral obstruction and 91 (69.47%) had benign ureteral obstruction. The average follow-up period was found to be 35.4 months. During their follow-up, 18 (13.74%) patients had symptoms such as stent related pain and dysuria, 11 (8.39%) had recurrent urinary tract infection, 8 (6.1%) had encrusted DJ stents, 3 (2.29%) had DJ stent migration and hematuria that requiring blood transfusion was observed in 1 (0.76%) patient.

Conclusions: Our study showed that the use of long term ureteral DJ stent is a safe and effective option in malignant and benign ureteral obstructions.

Keywords: Ureteral obstruction, Long term DJ stent, Curative surgery

GİRİŞ

Üreteral obstrüksiyonlar, benign veya malign etyolojiler ile ortaya çıkabilir. Benign üreteral obstrüksiyonlar, üriner sistem taş hastalığı, geçirilmiş cerrahi tedaviler, retroperitoneal fibrozis vb. nedenlerle oluşmaktadır. Malign üreteral obstrüksiyonlar ise intrinsik ve ekstrinsik tümöral lezyonlar sonucuyla oluşmakla beraber tedavileri benign üreteral obstrüksiyonlara göre daha zor olmaktadır (1). Malign üreteral obstrüksiyonlar sıklıkla ürogenital, jinekolojik ve kolorektal neoplazmların sonucu olarak ortaya çıkmaktadır. Güncel literatürde üreteral obstrüksiyonların mevcut görülme sıklığı bilinmemekle beraber tedavi edilmediği takdirde böbrek fonksiyonlarında bozulma, elektrolit imbalansı, idrar yolu enfeksiyonu ve ağrı gibi durumlara yol açabilir (2).

Üreteral obstrüksiyonlarda, üreteral DJ stent veya perkütan nefrostomi uygulaması obstrüksiyonu gidermek amacıyla geçici tedavi seçenekleri arasında bulunmaktadır ancak bazı durumlarda hastalara küratif tedavi yapılamadığı için bu yöntemler kalıcı bir çözüm yolu olarak sunulmaktadır. Üreteral DJ stent takılması daha minimal invaziv bir yöntemdir ancak stent ilişkili irritatif semptomlara, hematüriye sebep olabilir (3). Perkütan nefrostomi uygulaması ise daha etkili drenaj sağlamasına rağmen ekstrakorporeal tüp sebebiyle hastaların yaşam kalitesine olumsuz etkileri mevcuttur (4). Bu çalışmada üreteral obstrüksiyonu olan ancak küratif cerrahi yapılamayan hastalarda uzun ömürlü DJ stent kullanımının etkinliğini ve güvenilirliğini değerlendirmeyi amaçladık.

GEREÇ VE YÖNTEMLER

İstanbul Medeniyet Üniversitesi Göztepe Prof. Dr. Süleyman Yalçın Şehir Hastanesi Klinik Araştırmalar Etik Kurulu onayı alındıktan sonra (No: 2022/0379- Tarih:15.05.2022), kliniğimizde üreteral obstrüksiyon nedeni ile uzun ömürlü üreteral DJ stent uygulaması yapılan hastalar retrospektif olarak değerlendirildi. Hastaların demografik verileri, üreteral obstrüksiyon etyolojisi, takip süresi ve komplikasyonlar kaydedildi. Hastalara 4,8F-26cm Boston Percuflex™Plus üreteral stent kullanıldı ve yılda bir defa değiştirilmesi planlandı. Herhangi bir komplikasyon sebebiyle bir yıldan önce stent değişimi yapılan hastalar erken değişim gerçekleşen hastalar olarak tanımlandı. Hastalarda takip süresince görülen ağrı, dizüri, pollaküri gibi semptomlar, stent ilişkili semptomlar olarak tarif edildi. Hastalar takip süresince altı ayda bir rutin kontrollere çağrıldı. Kontroller esnasında serum kreatinin, glomerüler filtrasyon oranı (eGFR), tam idrar tahlili ve idrar kültürü analizi yapıldı. Stent migrasyonu ve enkrustasyon varlığının değerlendirilmesi için direk üriner sistem grafisi çekildi.

Sürekli değişkenler ortalama ve standart sapma değerleriyle sunularak istatistiksel analize tabi tutuldu. Bu analizde

Student t testi kullanıldı. Kategorik değişkenler ise ki-kare testi veya Fisher's exact testi kullanılarak karşılaştırıldı. P değeri 0,05'ten küçükse istatistiksel olarak anlamlı kabul edildi. İstatistiksel analizler, Statistical Package for the Social Sciences (SPSS) versiyon 21 yazılımı (IBM Corp, Armonk, NY, ABD) kullanılarak gerçekleştirildi.

BULGULAR

Çalışmaya 2015 ile 2022 yılları arasında üreteral obstrüksiyon sebebiyle uzun ömürlü DJ stent uygulaması yapılan ve takip edilen 68'i kadın (%51,9), 63'ü erkek (%48,1) olmak üzere toplam 131 hasta dahil edildi. Hastaların ortalama yaşı 56,5 (21-89) idi. Takip süresince 17 (%12,97) hasta hayatını kaybetti. Üreteral obstrüksiyon 62 (%47,33) hastada sağ, 57 (%43,51) hastada ise sol tarafta iken 12 (%9,16) hastada bilateral idi. Obstrüksiyon etyolojisi olarak 40 (%30,53) hastada malign üreteral obstrüksiyon, 91 (%69,47) hastada benign üreteral obstrüksiyon tespit edilmiştir. Uzun ömürlü DJ stent ile takip edilen malign üreteral obstrüksiyonu olan hastaların çoğunluğu jinekolojik malignite öyküsüne sahipken (19 hasta, %14,5), jinekolojik cerrahi öyküsü (22 hasta, %16,79), genitoüriner sistem cerrahisi öyküsü (21 hasta, %16,1), gastrointestinal sistem cerrahisi öyküsü (19 hasta, %14,5) diğer sebeplerdi. Benign üreteral obtrüksiyonun etyolojisinde ise geçirilmiş travma öyküsü (16 hasta, %12,21) ve retroperitoneal fibrozis (13 hasta, %9,92) mevcuttu. Üreteral obstrüksiyon seviyesi 37 hastada (%28,25) proksimal üreter seviyesinde, 28 hastada (%21,37) mid-üreter seviyesinde, 66 hastada (%50,38) ise distal üreter seviyesindeydi. Hastaların uzun ömürlü DJ stent uygulaması öncesi eGFR ort. 79,7 ml/dak/1,73m^2 iken takip süresince ort. 76,02 ml/dak/1,73m^2 olduğu görüldü (P değeri=0,21) (Tablo 1). Hastaların ortalama takip süresi 35,4 ay (0-85) olarak bulundu. Takip süresince 16 (%12,21) hastada erken stent değişimi gerekirken, 18 (%13,74) hastada stent ilişkili semptomlar, 11 (%8,39) hastada tekrarlayan üriner sistem enfeksiyonu, 8 (%6,1) hastada enkruste DJ stent, 5 (%3,81) hastada işlem sonrası ürosepsis, 3 (%2,29) hastada DJ stent migrasyonu ve 1 (%0,76) hastada ise kan transfüzyonu gerektiren hematüri geliştiği görülmüştür (Tablo 2).

Tablo 1. Demografik Veriler

Cinsiyet	
Erkek	63 (%48,1)
Kadın	68 (%51,9)
Yaş, ort. (En düşük-En yüksek)	56,5 (21-89)
Tanı	
Malign Üreteral Obstrüksiyon	**40 (%30,53)**
Jinekolojik maligniteler	19 (%14,5)
Retroperitoneal kitle	3 (%2,29)
Genitoüriner sistem maligniteleri	9 (%6,87)
Gastrointestinal sistem maligniteleri	9 (%6,87)
Benign Üreteral Obstrüksiyon	**91 (%69,47)**
Jinekolojik cerrahi öyküsü	22 (%16,79)
Genitoüriner sistem cerrahisi öyküsü	21 (%16,1)
Gastrointestinal sistem cerrahisi öyküsü	19 (%14,5)
Geçirilmiş travma öyküsü	16 (%12,21)
Retroperitoneal fibrozis	13 (%9,92)
Üreteral Obstrüksiyon Lokasyonu	
Proksimal	37 (%28,25)
Orta	28 (%21,37)
Distal	66 (%50,38)
Taraf	
Sağ	62 (%47,33)
Sol	57 (%43,51)
Bilateral	12 (%9,16)

Tablo 2. Komplikasyonlar

Stent ilişkili semptomlar	18 (%13,74)
Tekrarlayan üriner sistem enfeksiyonu	11 (%8,39)
DJ stentte taşlaşma	8 (%6,1)
İşlem sonrası ürosepsis	5 (%3,81)
DJ stent migrasyonu	3 (%2,29)
Transfüzyon gereksinimi olan hematüri	1 (%0,76)

TARTIŞMA

Malign ve benign üreteral obstrüksiyon, prevalansı artmakla beraber üroloji pratiği için önemli bir tedavi sorunu olmaya devam etmektedir. Bu çalışmada üreteral obstrüksiyon etyolojisinde jinekolojik maligniteler ve cerrahi tedaviler literatüre benzer şekilde daha yüksek oranda bulunmuştur. Günümüzde üreteral obstrüksiyonu gidermek için rekonstrüktif cerrahiler önerilmektedir ancak her zaman mümkün olmamaktadır. Geçmişte üriner diversiyon için açık nefrostomi, kutanöz üreterostomi ve ileal/kolon kondüit gibi açık cerrahi yöntemler tercih edilmekteyken günümüzde teknolojinin gelişmesiyle birlikte perkütan nefrostomi ve üreteral stent yerleştirilmesi gibi minimal invazif teknikler yapılmaktadır (5,6). Hangi yöntemin daha iyi olduğu, her iki yöntemin de avantajları ve dezavantajları sebebi ile tartışmalıdır ancak hastaya yönelik planlanma yapılması gerekmektedir. Hayat kalitesinin değerlendirildiği çalışmalarda perkütan nefrostomi ile üreteral DJ stent uygulamasının sonuçları benzerken, hastalara seçenek sunulduğunda DJ stent uygulamasının hastalar tarafından daha çok tercih edildiği görülmüştür (7). Perkütan nefrostomi ile etkili drenaj sağlanırken, ekstrakorporal tüp hastaların hareketliliğini ve özgüvenini olumsuz yönde etkilemektedir. Ayrıca uzun süreli kullanımlarda sık görülen nefrostomi tüpünün çıkması ve enfeksiyon gibi komplikasyonlarla ilişkilidirler ve her 3 ayda bir rutin olarak değiştirilmeleri gerekir (4).

Bizim çalışmamızda bir yıl kullanılabileceği belirtilen uzun ömürlü DJ stentler kullanılmıştır ve hastalar bu şekilde nefrostomi veya kısa ömürlü DJ stentlerde olduğu gibi üç aylık aralıklarla girişime maruz kalmamış ve takiplerinde erken DJ stent değişim oranı %12,21 olarak düşük bir oran tespit edilmiştir. Rosenberg ve ark. yaptığı çalışmada malign ekstrinsik üreteral obstrüksiyonu olan hastalarda düzenli değiştirilen DJ stent uygulamasının hastalar için iyi bir seçenek olduğu ve renal fonksiyonların korunduğu gösterilmiştir (8). Rosevar ve ark. yaptığı çalışmada üreteral obstrüksiyonu olan 54 hastaya uzun ömürlü DJ stent (6F-7F Percuflex stents, Boston Scientific, Natick, Mass) kullanılmış ve 16 aylık takip sonrası hastaların kreatinin seviyelerinde %36 oranında düşüş görülmüştür. Yine bu çalışmada üreteral obstrüksiyonu olan hastalara ilk basamak tedavi olarak perkütan nefrostomi işlemi yerine uzun ömürlü DJ stent takılması önerilmiştir (9). Benzer şekilde bu güncel çalışmada takip süresince hastaların eGFR oranlarında anlamlı fark izlenmemiş ve böbrek fonksiyonlarının korunduğu görülmüştür. Elsamra ve ark. yaptığı çalışmada üreteral obstrüksiyonu olan hastalarda tandem üreteral stent kullanımı başarılı bulunmakla beraber tandem stent uygulamasının metalik stentlere göre daha düşük oklüzyon oranı ve kullanım kolaylığı olduğu rapor edilmiştir (10). Ancak in vitro yapılan bir çalışmada tandem stent, metalik stent ve lümeni geniş tek bir stent (8F) kullanımı değerlendirilmiş ve lümeni geniş tek bir stentin akışı daha iyi sağladığı bulunmuştur (6). Çalışmamızda tüm hastalara 4,8F DJ stent kullanılmıştır ve takipleri süresince sadece 8 hastada (%6,1) enkrustasyon görülmüştür ve erken DJ stent değişim oranı oldukça düşüktür. Corrales ve ark. yayınladığı bir derlemede metalik stentler (Resonance, Memokath 051, Uventa, Allium, Bard), ekstra-anatomik stent (Detour—Coloplast®) ve tümör stentleri (Coloplast® ve Bard ®-angiomed, UROSOFT) incelendiğinde bu stentlerin üreteral obstrüksiyonu bulunan hastalarda etkin ve güvenilir bir şekilde kullanılabileceğini ve bu stentlerin kısa ömürlü DJ stentlere göre maliyet avantajı olduğunu bildirmiştir ancak bu durum ülkelere ve sağlık sistemlerine bağlı olarak değişkenlik gösterebilir, aynı zamanda günümüzde artık bu çalışmada olduğu gibi uzun ömürlü polimer yapılı DJ stentler mevcuttur. Her ne kadar bizim çalışmamızda maliyet analizi yapılmasa da metalik stentlere oranla daha düşük maliyetli olduklarını ancak bu durumun sağlık sistemi ve ülkelere göre farklılık göstereceği bilinmelidir (1).

Çalışmanın limitasyonları olarak retrospektif bir çalışma olması ve sadece DJ stent takılabilen hastaların dahil edilmesi ve bu sebeple stent uygulamasının hangi hastalarda uygulanabilirliği ve başarı oranı konusunda bir sonuç vermemesi, ek olarak perkütan nefrostomi takılan hastalarla karşılaştırmalı analiz yapılmaması olarak belirtilebilir.

Bu çalışmada takip süresi ort. 35,4 ay olarak bulunmuş olup literatürdeki yayınlara göre daha uzun bir takip süresi mevcuttur. Literatürde uzun ömürlü DJ stent ile takip edilen hastalarda görülen komplikasyon oranları ile ilgili bilgi oldukça kısıtlıdır. Bu çalışmada takip süresince yanlızca bir hastada kan transfüzyonu gerektiren hematüri gelişmiştir. DJ stent uygulaması sonrası irritatif semptomlar hastaların %13,74'ünde görülmüştür. Bu durum uzun ömürlü DJ stentlerin üreteral obstrüksiyonu olan hastalarda güvenli bir şekilde kullanılabileceğini göstermektedir.

SONUÇLAR

Üreteral obstrüksiyonu olan ve küratif cerrahi yapılamayan hastalarda uzun ömürlü üreteral DJ stent uygulaması minimal invazif, etkin ve güvenli bir yöntemdir. Stent teknolojisindeki gelişmeler, üreticiler tarafından garanti edilen bekleme süresini bir yıla uzatmış ve değiştirme sayısının azalması sebebiyle stent kullanımı daha çekici hale gelmiştir. İleriki dönemde bu konuda yapılan prospektif karşılaştırmalı çalışmalar ile hastaların hangi tip stentler ile daha iyi sonuç elde edebileceği anlaşılabilecektir.

Conflict of interest: The authors declare that they have no conflict of interest.

Financial Disclosure: The authors declared that this study has received no financial support.

Etik Kurul: İstanbul Medeniyet Üniversitesi Göztepe Prof. Dr. Süleyman Yalçın Şehir Hastanesi Klinik Araştırmalar Etik Kurulu onayı alındıktan sonra (No: 2022/0379- Tarih:15.05.2022).

KAYNAKLAR

1. Corrales, M., Doizi, S., Barghouthy, Y., Kamkoum, H., Somani, B., & Traxer, O. A systematic review of long-duration stents for ureteral stricture: which one to choose? World Journal of Urology, 2021; 39(9): 3197–3205. https://doi.org/10.1007/s00345-020-03544-x
2. Guachetá-Bomba, P. L., Echeverría-García, F., & García-Perdomo, H. A. (2021). Predictors for failure of endoscopic ureteric stenting in patients with malignant ureteric obstruction: systematic review and meta-analysis. BJU International, 2021; 127(3):292–299. https://doi.org/10.1111/bju.15237
3. Yu, S. H., Ryu, J. G., Jeong, S. H., Hwang, E. C., Jang, W. S., et al. Predicting factors for stent failure-free survival in patients with a malignant ureteral obstruction managed with ureteral stents. Korean Journal of Urology, 2013; 54(5): 316–321. https://doi.org/10.4111/kju.2013.54.5.316
4. Savin, Z., Herzberg, H., Ben-David, R., Dekalo, S., Mintz, I., et al. Long-Term Follow-Up of Yearly Replaced Double Internal Stents for Extrinsic Malignant Ureteral Obstruction. Journal of Endourology, 2021;35(1):71-76. https://doi.org/10.1089/end.2020.0469
5. Ganatra, A. M., & Loughlin, K. R. The management of malignant ureteral obstruction treated with ureteral stents. Journal of Urology, 2005;174(6):2125-2128. https://doi.org/10.1097/01.ju.0000181807.56114.b7
6. Shilo, Y., Modai, J., Leibovici, D., Dror, I., & Berkowitz, B. Comparative study of renal drainage with different ureteral stents subject to extrinsic ureteral obstruction using an in vitro ureter-stent model. BMC Urology,2021;21(1). https://doi.org/10.1186/s12894-021-00865-w
7. Joshi HB, Adams S, Obadeyi OO. Nephrostomy tube or "JJ" ureteric stent in ureteric obstruction: assessment of patient perspectives using quality-of-life survey and utility analysis. Eur Urol 2001;39:695-701, https://doi.org/10.5527/wjn.v5.i2.172
8. Rosenberg BH, Bianco FJ Jr, Wood DP Jr, et al Stent-change therapy in advanced malignancies with ureteral obstruction. J Endourol 2005;19:63-67
9. Rosevear, H. M., Kim, S. P., Wenzler, D. L., Faerber, G. J., Roberts, W. W., & Wolf, J. S. Retrograde Ureteral Stents for Extrinsic Ureteral Obstruction: Nine Years' Experience at University of Michigan. Urology, 2007;70(5),846-850.

https://doi.org/10.1016/j.urology.2007.07.008

10. Elsamra, S. E., Motato, H., Moreira, D. M., Waingankar, N., Friedlander, J. I., et al. Tandem ureteral stents for the decompression of malignant and benign obstructicny CHNe uropathy. Journal of Endourology, 2013;27(10):1297-1302. https://doi.org/10.1089/end.2013.0281

Original Article
Özgün Araştırma

Endourol Bull. 2024;16(2):70-74. doi: 10.54233/endourolbull-1476917

A Technical Tip to Minimize Dorsal Vein Complex Bleeding in Extraperitoneal Laparoscopic Radical Prostatectomy: Using Balloon of the Urethral Catheter

Ekstraperitoneal Laparoskopik Radikal Prostatektomide Dorsal Ven Kompleksi Kanamasını Minimize Etmek İçin Teknik Bir İpucu: Üretral Kateter Balonu Kullanımı

Abdullah Gölbaşı [1], Eren Cengiz [1], Hüseyin Biçer [1], Gökhan Sönmez [2], Murat Keske [3], Mert Ali Karadağ [1]

[1] *Department of Urology, University of Health Science, Kayseri City Hospital, Kayseri, Türkiye*
[2] *Department of Urology, Erciyes University, School of Medicine, Kayseri, Türkiye*
[3] *Department of Urology, Kayseri Memorial Hospital, Kayseri, Türkiye*

ÖZET

Amaç: Kliniğimizde uyguladığımız, laparoskopik radikal prostatektomi sırasında dorsal ven kompleksinin (DVC) kontrolü sonrası devam eden sızıntı şeklindeki kanamaları durdurabilecek bir teknik ipucu ve sonuçlarını sunmayı amaçladık.

Gereç ve Yöntemler: Çalışmaya Mayıs 2021 ile Ağustos 2023 tarihleri arasında ekstraperitoneal laparoskopik radikal prostatektomi uygulanan hastalar dahil edildi. Tüm hastalara DVC'den gelen minimal kanamayı kontrol altına almak amacıyla üretradan 16 Fr foley kateter yerleştirildi ve 25 mL'lik şişirilmiş balon ile 15 dk süreyle traksiyon uygulandı. Hastaların demografik özellikleri, Prostat Spesifik Antijen (PSA) değerleri, gleason skoru, prostat hacmi ve ameliyat süresi kaydedildi.

Bulgular: Toplam 95 hasta dahil edildi. Ortalama yaş, PSA, prostat volümü değerleri sırasıyla 67,2 (49- 76) yıl, 8,43 (4-21) ng/ml, 46,32 (28-79) ml iken, medyan gleason skoru değeri ise 6 (6-8) idi. Operasyon süreleri ise ortalama 162,5 (126-237) idi. Ortalama olarak ameliyat süreleri çalışmaya katılmayan hastalarınkinden farklı değildi.

Sonuç: Bize göre kateter balon kompresyonu, kanamayı kontrol etmek ve net görüntüleme altında anastomozu kolaylaştırmak için güvenli ve uygulanabilir bir tekniktir. Bu tekniğin prospektif, randomize, çift kör çalışmalarla desteklenmesi gerekmektedir.

Anahtar Kelimeler: Prostat Kanseri, Dorsal Ven Kompleksi, Laparaskopi

Cite As: *Golbasi, A., Cengiz, E., Bicer, H., Sonmez, G., Keske, M., Karadag, M.A. (2024) A Technical Tip to Minimize Dorsal Vein Complex Bleeding in Extraperitoneal Laparoscopic Radical Prostatectomy: Using Balloon of the Urethral Catheter. Endourol Bull. 2024;16(2):70-74.* https://doi.org/10.54233/endourolbull-1476917

Corresponding Author : Abdullah Gölbaşı, MD, Department of Urology, Kayseri City Hospital, Kayseri, Türkiye.
e-mail: dr.abdullahgolbasi@gmail.com
Received : May 1, 2024 ***Accepted*** : May 27, 2024

ABSTRACT

Objective: We aimed to present a technical tip that can stop bleeding in the form of leakage after control of the dorsal vein complex (DVC) during laparoscopic radical prostatectomy and its results.

Material and Methods: Patients who underwent extraperitoneal laparoscopic radical prostatectomy between May 2021 and August 2023 were included in the study. In all patients, a 16 Fr foley catheter was placed through the urethra to control minimal bleeding from the DVC, and traction was applied for 15 min with a 25 ml inflated balloon. Demographic characteristics, Prostate Specific Antigen (PSA) values, gleason scores, prostate volumes and operation times were recorded.

Results: A total of 95 patients were included in the study. The mean age, PSA and prostate volume values were 67.2 (49-76) years, 8.43 (4-21) ng/ml, 46.32 (28-79) ml, respectively, while the median Gleason score value was 6 (6-8). The mean operation time was 162.5 (126-237). Mean operative times were not different from those of patients who did not participate in the study.

Conclusions: In our opinion, catheter balloon compression is a safe and feasible technique to control bleeding and facilitate anastomosis under clear visualization. This technique needs to be supported by prospective, randomized, double-blind studies.

Keywords: Prostate Cancer, Dorsal Vein Complex, Laparoscopy

INTRODUCTION

Prostate cancer is the second most common cancer diagnosed in men. In 2020, approximately 1.4 million people were diagnosed worldwide (1). Laparoscopic Radical Prostatectomy (LRP) and Robotic Assisted Radical Prostatectomy (RARP) are common methods for the treatment of localized prostate cancer.

One of the most important steps during these surgeries is Dorsal Vein Complex (DVC) control. Serious bleeding may occur, so there are many methods for DVC control, the most common of which is the eight-suture method. Apical dissection is very important to protect the urethra; but bleeding from DVC may cause difficulties in this step. In some cases, even if DVC is largely controlled and apical dissection is completed and the urethra is separated from the prostate, bleeding from DVC may continue in the form of leakage (2,3).

We aimed to present a technical tip that can stop these bleedings in the form of leakage that continues after DVC control that we have applied in our department.

MATERIAL AND METHODS

We included 95 patients who underwent extraperitoneal laparoscopic radical prostatectomy between May 2021 and August 2023 in the Urology Clinic of our hospital. In order to control minimal bleeding due to DVC, all patients underwent the technical tip described below.

Surgical Technique

All patients underwent extraperitoneal laparoscopic radical prostatectomy with 5 trocars. Under 15 mmHg pressure, after removal of the anterior periprostatic fat, the endopelvic fascia was opened and the prostate was liberated from the levator muscles in the apical direction. The puboprostatic ligaments were cut bilaterally and the DVC was exposed. After that, the bladder neck was identified and dissected with the descending technique. The seminal vesicles and vas deferens on both sides were then found, freed and elevated; the denonvilliers fascia was opened, and the prostate pedicle was separated with polymer clips. Subsequently, a vessel closure system (LigaSure™, Medtronic, USA) was used for DVC ligation. Before the vesicourethral anastomosis, a 16 Fr foley catheter was inserted through the urethra to control minimal bleeding from DVC (Figure-1), by a 25 ml inflated balloon, and traction was applied (Figure-2). After 15 minutes of compression, the bleeding was controlled (Figure-3).

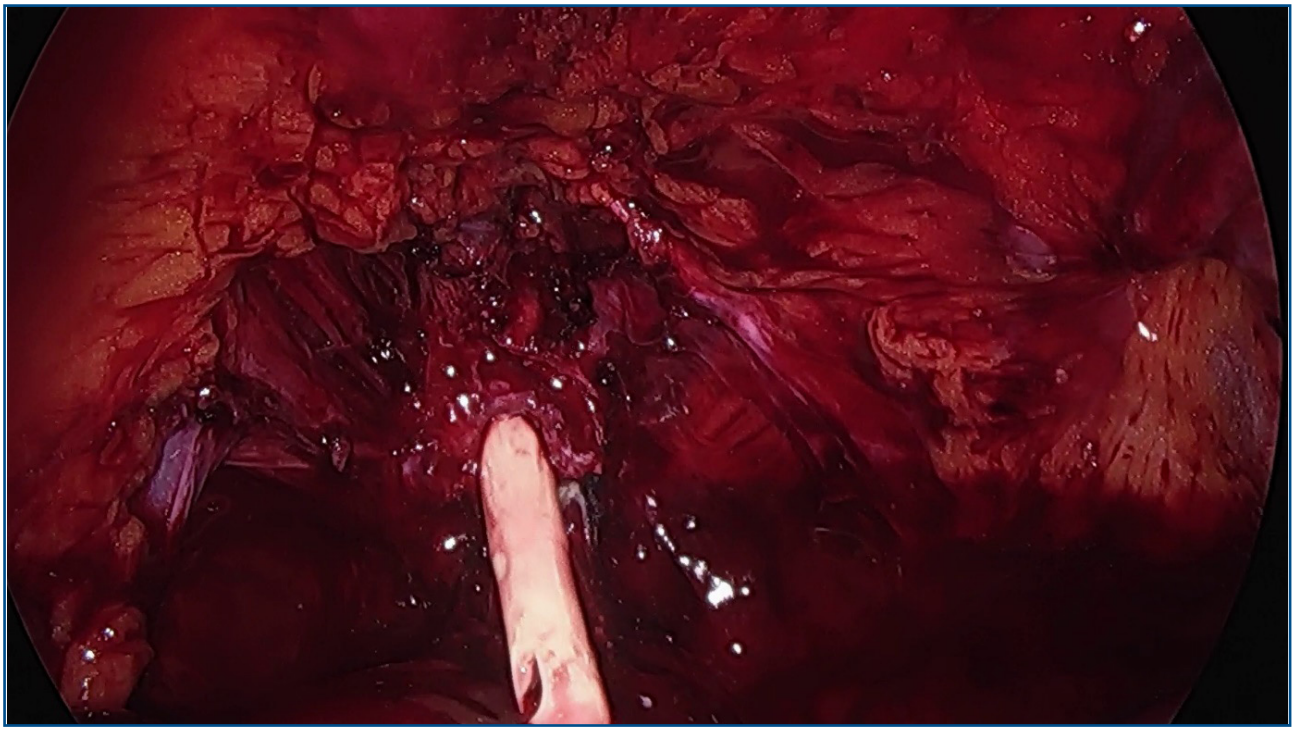

Figure 1. Technique to control minimal DVC bleeding using a catheter balloon. Endoscopic view of minimal bleeding after DVC control.

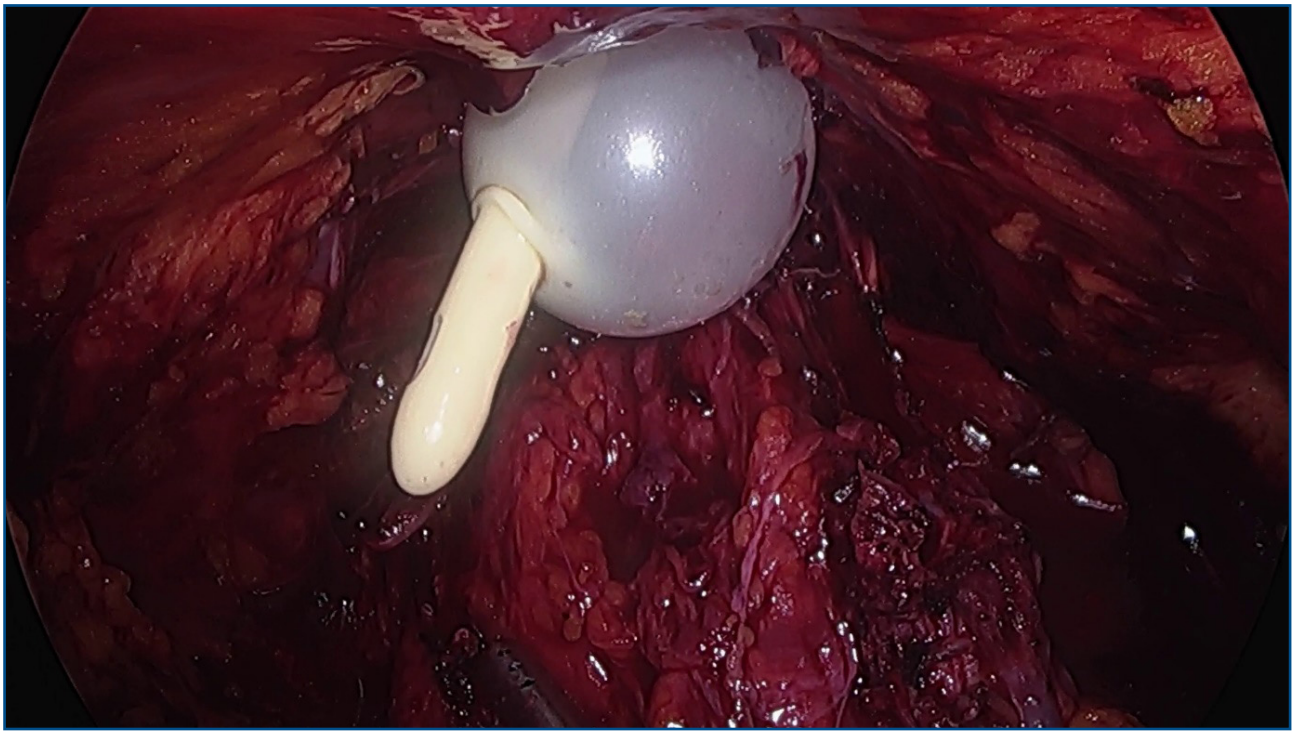

Figure 2. Compression with catheter balloon.

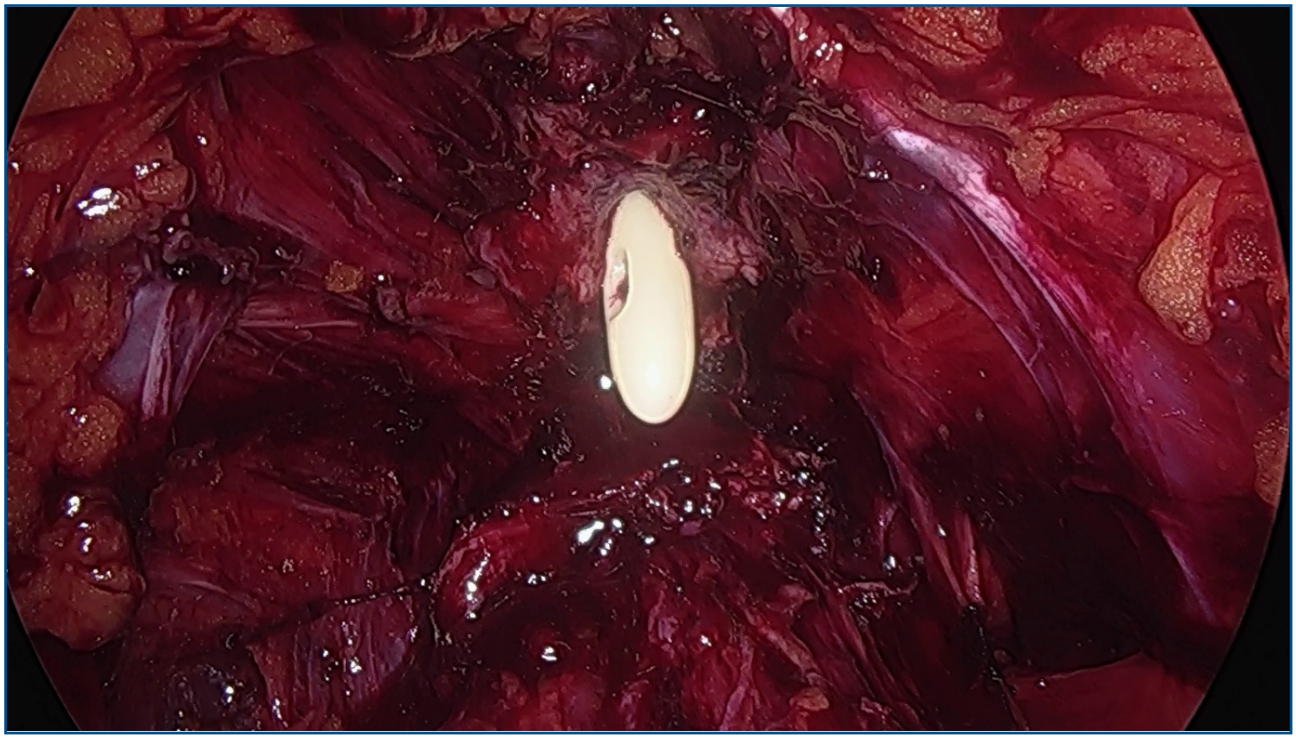

Figure 3. After 15 minutes, minimal bleeding due to DVC was completely controlled.

RESULTS

A total of 95 patients were included in the study. The mean age, PSA and prostate volume values were 67.2 (49-76) years, 8.43 (4-21) ng/ml, 46.32 (28-79) ml, respectively, while the median Gleason score value was 6 (6-8). The mean operation time was 162.5 (126-237) minutes. The mean operation times were not different from the patients who were not included in the study. Demographic characteristics of the patients are summarised in Table-1.

Table 1. Demographic Characteristics of the Patients Included in the Study

Age, years, mean (min-max)	67.2 (49-76)
PSA (ng/ml)	8.43 (4-21)
Gleason Score, median (min-max)	6 (6-8)
Operational Time, min, mean (min-max)	162.5 (126-237)
Prostate Size, volume, mean (min-max)	46.32 (28-79)

DISCUSSION

Laparoscopic Radical Prostatectomy is one of the most technically challenging laparoscopic surgeries. DVC bleeding is the most common cause of intraoperative bleeding and can be observed in 44% of cases, so DVC ligation is one of the most important steps in this operation. DVC control was first described in 1954 and many ligation methods have been described since then. Although some studies have reported techniques that do not require ligation to control DVC, ligation methods are now widely used to control DVC (4). The most used method is suture ligation, but vascular closure systems (LigaSure™, Medtronic, USA) are also used. DVC suturing is a difficult and prolonged process depending on the size of the prostate and the thickness of the DVC, and superficial suturing may cause bleeding and deep suturing may damage the urethra (5). In one of these studies, the foley catheter inserted from the urethra was tractioned by inflating 20-40 ml balloon and DVC control was achieved, but it was observed that bleeding was statistically higher compared to the ligation methods (6).

In our department, 95 extraperitoneal laparoscopic radical prostatectomies were performed between May 2021 and August 2023, and in all of them, the vessel closure system (LigaSure™, Medtronic,USA) was used for DVC ligation. After DVC ligation, a 16 Fr foley catheter was inserted through the urethra and the balloon was inflated with 25 ml saline, then traction was applied and waited for 15 minutes. In the meantime, the rectum was checked and pelvic lymph node dissection was performed in patients having indications. It was observed that all oozing bleeding was controlled at the end of 15 minutes. Considering that pelvic lymph dissection was performed in patients with indication during the suturing and DVC ligation time, we think that this waiting time did not cause an increase in the mean operation time. No perioperative blood requirement and no significant postoperative hemoglobin drop were observed in any patients.

This technical tip seems to have several limitations. These are small number of patients and the lack of a comparison group. Our aim is to present only our experience with minimal bleeding after DVC ligation, which we found to be successful. This is a technical tip, not a study, and this technique needs to be supported by prospective, randomized, double-blind studies.

CONCLUSION

We believe that compression with a catheter balloon traction successfully controls minimal bleeding after DVC ligation instead of re-ligation with sutures or vessel closure systems (LigaSure™,Medtronic,USA). The other advantage may be its ease that can be performed especially by surgeons who are in the learning curve.

Conflict of interest: The authors declare that they have no conflict of interest.

Financial Disclosure: The authors declared that this study has received no financial support.

Ethics Committee: Kayseri City Hospital Non-Interventional Clinical Research Ethics Committee Date: 28.03.2024 Protocol: 37

REFERENCES

1. Culp MB, Soerjomataram I, Efstathiou JA, Bray F, Jemal A. Recent Global Patterns in Prostate Cancer Incidence and Mortality Rates. Eur Urol. 2020 Jan;77(1):38-52. https://doi.org/10.1016/j.eururo.2019.08.005.
2. García-Segui A, Sánchez M, Verges A, Caballero JP, Galán JA. Narrowing of the dorsal vein complex technique during laparoscopic radical prostatectomy: a simple trick to simplify the control of venous plexus. Urol J. 2014 Nov 1;11(5):1873-7. PMID: 25361707.
3. Gözen AS, Tokas T, Akin Y, Klein J, Rassweiler J. Impact of barbed suture in controlling the dorsal vein complex during laparoscopic radical prostatectomy. Minim Invasive Ther Allied Technol. 2015 Apr;24(2):108-13. https://doi.org/10.3109/13645706.2014.960940.
4. Xu P, Xu A, Chen B, Zheng S, Xu Y'et al. Huang P, Zhang Y, Ge Y, Liu C. Ligation-free technique for dorsal vascular complex control during laparoscopic radical prostatectomy: a single-center experience from China. World J Urol. 2017 Mar;35(3):395-402. https://doi.org/10.1007/s00345-016-1889-0.
5. Wang Y, Cheng X, Xiong Q, Cheng S. The progress of dorsal vascular complex control strategy in radical prostatectomy. J Int Med Res. 2023 Feb;51(2):3000605231152091. https://doi.org/10.1177/03000605231152091.
6. Rainwater LM, Segura JW. Technical consideration in radical retropubic prostatectomy: blood loss after ligation of dorsal venous complex. J Urol. 1990 Jun;143(6):1163-5. https://doi.org/10.1016/s0022-5347(17)40215-1.

Author Guidelines
Yazarlara Bilgi

Dergi, yazarların yayın haklarını kısıtlama olmaksızın saklamasını sağlar.
Yazarların kimlik bilgileri ve e-posta adresleri hiçbir şekilde başka amaçlar için kullanılmamaktadır.
Gönderilen yazıların daha önce yayınlanmamış olması veya başka bir dergide değerlendirme aşamasında olmaması gerekmektedir.
Gönderilen yazılar herhangi bir kongrede takdim edilmiş ise bu durum gönderilen makalede dipnot olarak bildirilmelidir.
Derginin Yayın Kurulu, tüm itirazları Yayın Etik Komitesi (COPE https://publicationethics.org/resources/flowcharts/handling-post-publication-critiques) kuralları çerçevesinde ele alır. Bu gibi durumlarda, yazarlar temyiz ve şikayetleri ile ilgili olarak yayın kuruluyla doğrudan iletişime geçmelidir. Gerektiğinde, dahili olarak çözülemeyen sorunları çözmek için bir ombudsman atanabilir. Editör, tüm temyiz ve şikayetler için karar verme sürecindeki nihai otoritedir.
Derginin editoryal ve yayın süreçleri, International Council of Medical Journal Editors (ICMJE http://www.icmje.org/recommendations/browse/publishing-and-editorial-issues/) yönergelerine göre şekillendirilmektedir.
Endoüroloji Bülteni yayıncılıkta şeffaflık ve en iyi uygulama ilkelerine uygundur (DOAJ https://doaj.org/apply/transparency/).
Bir yazının yayın için kabul edilmesinde en önemli kriterler özgünlük, yüksek bilimsel kalite ve alıntı potansiyelinin varlığıdır. Dergide yayınlanmak üzere gönderilen yazılar, daha önce başka bir yerde yayınlanmamış ve yayınlanmak üzere gönderilmemiş olmalıdır. Bir kongrede tebliğ edilmiş ve özeti yayınlanmış çalışmalar organizasyonun adı, yeri ve tarihi belirtilmek şartı ile kabul edilebilir.
Deneysel, klinik, ilaç çalışmalarının ve bazı vaka raporlarının araştırma protokollerinin Etik Kurul tarafından uluslararası sözleşmelere uygun olarak onaylanması (Dünya Tıp Birliği Helsinki Deklarasyonu "İnsan Denekleri ile İlgili Tıbbi Araştırmalar İçin Etik İlkeler" https://www.wma.net/policies-post/wma-declaration-of-helsinki-ethical-principles-for-medical-research-involving-human-subjects/) gereklidir.
Etik kurul izni gerektiren tüm araştırmalar için etik kurul onayı alınmalı, bu onay makalede belirtilmeli ve belgelenmelidir.
Etik kurul izni gerektiren çalışmalarda izne ilişkin bilgiler (kurulun adı, tarih ve sayısı) yöntem bölümünde ve makalenin ilk/son sayfalarından birinde yer alabilir; Olgu sunumlarında aydınlatılmış onam/rıza formunun imzalanması ile ilgili bilgilere makalede yer verilmelidir.

- Üzerinde deneysel çalışma yapılan gönüllü kişilere ve hastalara uygulanan prosedürler ve sonuçları anlatıldıktan sonra onaylarının alındığını ifade eden bir açıklama yazının içinde bulunmalıdır.
- Hayvanlar üzerinde yapılan araştırmalarda acı ve rahatsızlık verilmemesi için yapılan uygulamalar ve alınan tedbirler açık olarak belirtilmelidir.
- Hasta onamı, etik kurulun adı, etik kurul toplantı tarihi ve onay numarası ile ilgili bilgiler makalenin "Gereç ve Yöntem" bölümünde de belirtilmelidir.
- Hastaların gizliliğini korumak, yazarların sorumluluğundadır. Hasta kimliğini ortaya çıkarabilecek fotoğraflar için, hasta ve/veya yasal temsilcileri tarafından imzalanan onayların alınması ve yazılı onay alındığının metin içerisinde belirtilmesi gereklidir.

Dergimize gönderilen tüm yazılar intihal tespit etme programı (iThenticate) ile değerlendirilmektedir. Benzerlik oranının %20 ve altı olması önerilmektedir.
Derginin Yayın Kurulu, tüm itirazları Yayın Etik Komitesi (COPE) kuralları çerçevesinde ele alır. Bu gibi durumlarda, yazarlar temyiz ve şikayetleri ile ilgili olarak yayın kuruluyla doğrudan iletişime geçmelidir. Gerektiğinde, dahili olarak çözülemeyen sorunları çözmek için bir ombudsman (bağımsız denetçi) atanabilir. Baş Editör, tüm temyiz ve şikayetler için karar verme sürecindeki nihai otoritedir.
Endoüroloji Bülteni' ne gönderilen her makale, adı geçen yazarların tümünün imzaladığı Yazar Katkı ve Telif Hakları Formu ile birlikte gönderilmelidir. (https://dergipark.org.tr/tr/journal/3154/file-manager/17373/download)
Şekiller, tablolar veya hem basılı hem de elektronik formatlardaki diğer materyaller de dahil olmak üzere başka kaynaklardan alınan içeriği kullanan yazarların telif hakkı sahibinden izin almaları gerekir. Bu hususdaki hukuki, mali ve cezai sorumluluk yazarlara aittir.
Endoüroloji Bülteni'nde yayınlanan yazılarda belirtilen ifadeler veya görüşler yazarlara aittir. Editörler, editörler kurulu ve yayıncı, bu yazılar için herhangi bir sorumluluk kabul etmemektedir. Yayınlanan içerikle ilgili nihai sorumluluk yazarlara aittir.

Author Guidelines

Authors' credentials and e-mail addresses are not used for other purposes.

The submitted articles should be previously unpublished and should not be under consideration by any other journal.

If whole or a part of the submitted articles are presented in any congress, this should be noted in the submitted article.

The journal's Editorial Board handles all appeal and complaint cases within the scope of Committee on Publication Ethics (COPE) guidelines. In such cases, authors should contact the editorial office directly regarding their appeals and complaints. When needed, an ombudsperson may be assigned to resolve cases that cannot be resolved internally. The Editor in Chief is the final authority in the decision-making process for all appeals and complaints.

The editorial and publication processes of the journal are shaped following the guidelines of the International Council of Medical Journal Editors (ICMJE).

The journal conforms to the Principles of Transparency and Best Practice in Scholarly Publishing (DOAJ).

Originality, high scientific quality, and citation potential are the most important criteria for a manuscript to be accepted for publication. Manuscripts submitted for evaluation should not have been previously presented or already published in an electronic or printed medium. Manuscripts presented in a meeting should be submitted with detailed information on the organization, including the name, date, and location of the organization.

An approval of research protocols by the Ethics Committee following international agreements (World Medical Association Declaration of Helsinki "Ethical Principles for Medical Research Involving Human Subjects") is required for experimental, clinical, and drug studies and some case reports. If required, ethics committee reports or an equivalent official document will be requested from the authors.

- For manuscripts concerning experimental research on humans, a statement should be included that shows that written informed consent of patients and volunteers was obtained following a detailed explanation of the procedures they may undergo.
- For studies carried out on animals, the measures taken to prevent pain and suffering of the animals should be stated clearly.
- Information on patient consent, the name of the ethics committee, and the ethics committee approval number should also be stated in the Materials and Methods section of the manuscript.
- It is the authors' responsibility to protect the patients' anonymity carefully. For photographs that may reveal the identity of the patients, releases signed by the patient or their legal representative should be enclosed.

All submissions are screened by a similarity detection software (iThenticate), and the limitation without similarity is 20%.

Endourology Bulletin requires each submission to be accompanied by an Copyright Agreement and Acknowledgement of Authorship Form (available for download https://dergipark.org.tr/). Authors must obtain permission from the copyright holder when using previously published content, including figures, tables, or any other material in both print and electronic formats. In this regard, legal, financial, and criminal liabilities belong to the author (s).

Statements or opinions expressed in the manuscripts published in Endourology Bulletin reflect the author›s views (s) and not the opinions of the editors, the editorial board, or the publisher; the editors, the editorial board, and the publisher disclaim any responsibility or liability for such materials. The final responsibility regarding the published content rests with the authors.

PREPARATION OF MANUSCRIPT
YAZININ GÖNDERİMİ

Makaleler yalnızca online olarak https://dergipark.org.tr/pub/endouroloji adresinden gönderilebilir. Başka bir yolla gönderilen yazılar değerlendirilmeye alınmayacaktır.
Dergiye gönderilen yazılar, öncelikle yazının dergi kurallarına uygun olarak hazırlanmasını ve sunulmasını sağlayacakları teknik değerlendirme sürecinden geçer. Derginin kurallarına uymayan yazılar, teknik düzeltme talepleri ile gönderen yazara iade edilir. Editör, ana metni değiştirmeden düzeltme yapabilir. Editör, yukarıda belirtilen şartlara uymayan makaleleri reddetme hakkını saklı tutar.
Yazarların aşağıdaki belgeleri göndermeleri gerekir:

- Yazar Katkı ve Telif Hakları Formu
- Bilgilendirilmiş Onam Formu
- ICMJE Çıkar Çatışması Formu
- Başlık Sayfası (Makale Başlığı, kısa başlık, yazarın adı, unvanı ve kurumu, sorumlu yazarın iletişim bilgileri, araştırmayı destekleyen kuruluş varsa kuruluşun adı)
- Ana belge (Tüm makalelerde, ana metinden önce de Özet bölümü yer almalıdır)
- Şekiller (JPEG formatı)
- Tablolar (en fazla 6 tablo)

Ana Belgenin Yayına Hazırlığı

Yazılar bilgisayar ile çift aralıklı olarak 12 punto büyüklüğünde ve Times New Roman karakteri ile yazılmalıdır. Her sayfanın bütün kenarlarında en az 2.5 cm boşluk bırakılmalıdır. Ana metin, yazarların adları ve kurulları hakkında hiçbir bilgi içermemelidir.
Yayın çeşitleri;

Araştırma Türü	Özet	Kelime Sayısı	Referans Sayısı	Tablo ve Figürler
Özgün Araştırma	250	4000	30	10
Derleme	250	5000	100	10
Olgu Sunumu	300	2000	20	10

Özgün makaleler yapılandırılmış bir Özet (abstract) (Giriş, Gereç ve yöntemler, Bulgular, Sonuçlar, Referanslar, Tartışma, gerekli ise Onam, Figürler; resim, grafik çizim, video, Tablolar) içermelidir.
Olgu sunumları için yapılandırılmış Özet gerekmez. Özet bölümü 300 sözcük ile sınırlandırılmalıdır. Özet de kaynaklar, tablolar ve atıflar kullanılamaz. Özün bittiği satırın altında sayısı 3-5 arasında olmak üzere anahtar kelimeler verilmelidir.
Türkiye dışındaki ülkelerden yazı gönderen yazarlar için Başlık, Özet, Anahtar Kelimeler ve yazıyla ilgili diğer bazı temel bölümlerin Türkçe olarak gönderilmesi zorunlu değildir. Bu bölümlerin çevirileri, yazarlar tarafından gönderilen özgün İngilizce metinler dikkate alınarak dergi editörlüğü tarafından yapılacaktır.
Makalede kullanılan tüm kısaltmalar, ilk kullanımda tanımlanmalıdır. Kısaltma, tanımı ardından parantez içinde verilmelidir.
Ana metinde bir ilaç, ürün, donanım veya yazılım programından bahsedildiğinde, ürünün adı, ürünün üreticisi, üretim şehri ve üreten şirketin ülkesi de dahil olmak üzere ürün bilgileri (ABD'de ise devlet dahil) parantez içinde verilmelidir.
Anahtar kelime seçimi için lütfen Index Medicus'un (MeSH) tıbbi konu başlıklarına bakınız: https://meshb.nlm.nih.gov/MeSHonDemand .
Tüm kaynaklara, tablolara ve şekillere ana metinde atıfta bulunulmalı ve kaynaklar, ana metinde geçen sıraya göre numaralandırılmalıdır. Kullanılan semboller, sembollerin standart kullanımlarına uygun olmalıdır.
Özgün Araştırma makaleleri klinik veya temel araştırma sonuçlarını içermeli, eleştirel okuyucular için kabul edilebilir olacak kadar iyi belgelenmelidir. En fazla 4000 kelime olmalı ve sırasıyla aşağıdaki başlıkları içermelidir;

- Başlık (hem Türkçe hem İngilizce)
- Özet (hem Türkçe hem İngilizce)
- Anahtar Kelimeler (hem Türkçe hem İngilizce)
- Giriş
- Gereç ve yöntemler
- Bulgular

- Tartışma
- Sonuçlar
- Şekillerin ve tabloların başlıkları (gerekirse)
- Kaynaklar

Olgu sunumları en fazla 2000 kelime olmalı ve sırasıyla aşağıdaki başlıkları içermelidir;

- Başlık (hem Türkçe hem İngilizce)
- Özet (hem Türkçe hem İngilizce)
- Anahtar Kelimeler (hem Türkçe hem İngilizce)
- Giriş
- Olgu sunumu
- Tartışma ve Sonuç
- Şekillerin ve tabloların başlıkları (gerekirse)
- Kaynaklar

Derlemeler yapılandırılmış olmalı, en fazla 5000 kelimeden oluşmalı ve sırasıyla aşağıdaki başlıkları içermelidir;

- Başlık (hem Türkçe hem İngilizce)
- Özet (hem Türkçe hem İngilizce)
- Anahtar Kelimeler (hem Türkçe hem İngilizce)
- Ana metin
- Sonuç
- Şekillerin ve tabloların başlıkları (gerekirse)
- Kaynaklar

Sistematik derlemeler için yazarla PRISMA yönergelerine uymalıdır; http://www.prisma-statement.org/documents/PRISMA%202009%20checklist.pdf

Editöre Mektuplar en fazla 1000 kelime olmalı ve aşağıdaki alt başlıkları içermelidir;

- Başlık
- Anahtar kelimeler
- Ana metin
- Şekillerin ve tabloların başlıkları (gerekirse)
- Kaynaklar

Şekillerin ve tabloların yayına hazırlığı

- Şekiller, grafikler ve fotoğraflar, makale yükleme sistemi aracılığıyla ayrı dosyalar (JPEG formatında) halinde sunulmalıdır.
- Dosyalar bir Word belgesine veya ana belgeye gömülmemelidir.
- Şeklin alt birimleri olduğunda; alt birimler tek bir görüntü oluşturmak için birleştirilmemelidir. Her alt birim, başvuru sistemi aracılığıyla ayrı ayrı sunulmalıdır.
- Şekil alt birimlerini belirtmek için görüntüler Arabik rakamlarla (1,2,3...) numaralandırılmalıdır.
- Gönderilen her bir şeklin en düşük çözünürlüğü 300 DPI olmalıdır.
- Şekillerin başlıkları ana belgenin sonunda listelenmelidir.
- Bilgi veya resimler hastaların tanımlanmasına izin vermemelidir. Kullanılan herhangi bir fotoğraf için hastadan ve/veya yasal temsilcisinden yazılı bilgilendirilmiş onam alınmalıdır.

Tablolar ana belgeye gömülmeli veya ayrı dosyalar halinde sunulmalıdır. Tablo sayısı altı adet ile sınırlandırılmalıdır. Tüm tablolar, ana metinde kullanıldığı sırayla art arda numaralandırılmalıdır. Tablo başlıkları ve açıklamaları ana belgenin sonunda listelenmelidir.

Kaynaklar

Kaynaklar yazıda kullanılan kaynaklar cümlenin sonunda parantez içinde belirtilmelidir. Kaynaklar makalenin sonunda yer almalı ve makalede geçiş sırasına göre sıralanmalıdır. Kaynaklar yazarların soyadlarını ve adlarının baş harflerini, makalenin başlığını, derginin adını, basım yılını, sayısını, başlangıç ve bitiş sayfalarını belirtmelidir. Altı ve daha fazla yazarı olan makalelerde ilk 3 yazardan sonrası için 'et al.' veya 've ark.' ifadesi kullanılmalıdır. Kısaltmalar Index Medicus' a uygun olmalıdır.
Kaynakların sonuna alıntı yapılan makalelerin doi linki eklenmelidir.

Örnekler

Makaleler için:

1. Tasci A, Tugcu V, Ozbay B, Mutlu B, Cicekler O. Stone formation in prostatic urethra after potassium-titanyl-phosphate laser ablation of the prostate for benign prostatic hyperplasia. J Endourol 2009;23:1879-81. https://doi.org/10.1089/end.2008.0596

Kitap için:

1.Günalp İ: Modern Üroloji. Ankara: Yargıçoğlu matbaası, 1975. Kitap bölümleri için: Anderson JL, Muhlestein JB. Extra corporeal ureteric stenting during laparoscopic pyeloplasty. Philadelphia: W.B. Saunders; 2003. p. 288-307

Web sitesi için;

Gaudin S. How moon landing changed technology history [Internet]. Computerworld UK. 2009 [cited 15 June 2014]. Available from: http://www.computerworlduk.com/in-depth/it-business/2387/how-moon-landing-changed-technology-history/

Bildiriler için;

Proceedings of the Symposium on Robotics, Mechatronics and Animatronics in the Creative and Entertainment Industries and Arts. SSAISB 2005 Convention. University of Hertfordshire, Hatfield, UK; 2005.

Tez için;

Ercan S. Venöz yetmezlikli hastalarda kalf kası egzersizlerinin venöz fonksiyona ve kas gücüne etkisi. Süleyman Demirel Üniversitesi Tıp Fakültesi Spor Hekimliği Anabilim Dalı Uzmanlık Tezi. Isparta: Süleyman Demirel Üniversitesi. 2016.

Geri Çekme veya Reddetme

Yazıyı Geri Çekme: Gönderilen yazının değerlendirme sürecinde gecikme olması vb. gibi gerekçelerle yazıyı geri çekmek ve başka bir yerde yayınlatmak isteyen yazarlar yazılı bir başvuru ile yazılarını dergiden geri çekebilirler.

Yazı Reddi: Yayınlanması kabul edilmeyen yazılar, gerekçesi ile geri gönderilir.

Kabul sonrası

Makalenin kabul edilmesi durumunda, kabul mektubu iki hafta içinde sorumlu yazara gönderilir. Makalenin baskıdan önceki son hali yazarın son kontrolüne sunulur. Dergi sahibi ve yayın kurulu, kabul edilen makalenin derginin hangi sayısında basılacağına karar vermeye yetkilidir.

Yazarlar, makalelerini kişisel veya kurumsal web sitelerinde, uygun alıntı ve kütüphane kurallarına bağlı kalarak yayınlayabilirler.

PREPARATION OF MANUSCRIPT

Manuscripts can only be submitted through the journal's online manuscript submission and evaluation system, available at https://dergipark.org.tr/ Manuscripts submitted via any other medium will not be evaluated.

Manuscripts submitted to the journal will first go through a technical evaluation process where the editorial office staff will ensure that the manuscript has been prepared and submitted following the journal's guidelines. Submissions that do not conform to the journal's guidelines will be returned to the submitting author with technical correction requests. The editor reserves the right to reject manuscripts that do not comply with the aforementioned requirements. Corrections may be done without changing the main text.

Authors are required to submit the following:

- Copyright Agreement&Acknowledgement of Authorship Form,
- Informed Consent Form
- ICMJE Disclosure of Interest Form
- Title Page (including Title of Manuscript, Running title, author (s) 's name, title, and institution, corresponding author's contact information, Name of the organization supporting the research)
- Main document (All articles should have an abstract before the main text).
- Figures (Jpeg format)
- Tables (max 6 tables)

Preparation of the Main Document

The articles should be written double-spaced in 12 pt, Times New Roman character and at least 2.5 cm from all edges of each page. The main text should not contain any information about the authors' names and affiliations.

Publication Types;

Type of Article	Abstract	Text (Word)	References	Table&Figures
Original Article	250	4000	30	10
Review Article	250	5000	100	10
Case Reports	300	2000	20	10

Original articles should have a structured abstract. (Aim, Material and Methods, Results, Conclusion). For case reports, the structured abstract is not used. Limit the abstract to 300 words. References, tables, and citations should not be used in an abstract. Authors must include relevant keywords (3-5) on the line following the end of the abstract. The Turkish title, abstracts, and Turkish keywords are not required for the international authors. The editorial office will provide these.
All acronyms and abbreviations used in the manuscript should be defined first, both in the abstract and in the main text. The abbreviation should be provided in parentheses following the definition.
When a drug, product, hardware, or software program is mentioned within the main text, product information, including the name of the product, the producer of the product, and city and the country of the company (including the state if in the USA), should be provided in parentheses.
All references, tables, and figures should be referred to within the main text, and they should be numbered consecutively in the order they are referred to within the main text. The symbols used must be nomenclature used standards.
Original Research Articles should be maximum of 4000 words and include subheadings below;

- Title (both in Turkish and English)
- Abstract (both in Turkish and English)
- Keywords (both in Turkish and English)
- Introduction
- Material and Methods
- Results
- Discussion
- Conclusions
- Figures and Tables Legend (if necessary)
- References

Case Reports should be maximum of 2000 words and include subheadings below;

- Title (both in Turkish and English)
- Abstract (both in Turkish and English)
- Keywords (both in Turkish and English)
- Introduction
- Case Presentation
- Discussion and Conclusion
- Figures and Tables Legend (if necessary)
- References

Literature Reviews should be maximum of 5000 words and include subheadings below;

- Title (both in Turkish and English)
- Abstract (both in Turkish and English)
- Keywords (both in Turkish and English)
- Main text
- Conclusion
- Figures and Tables Legend (if necessary)
- References

Letters to the editor should be maximum of 1000 words and should include subheadings below;

- Title
- Keywords
- Main text

- Figures and Tables Legend (if necessary)
- References

Preparation of the Figures and Tables

The submission system should submit figures, graphics, and photographs as separate files (in JPEG format).

- The files should not be embedded in a Word document or the main document.
- When there are figure subunits, the subunits should not be merged to form a single image. Each subunit should be submitted separately through the submission system.
- Arabic numbers should number images to indicate figure subunits.
- The minimum resolution of each submitted figure should be 300 DPI.
- Figure legends should be listed at the end of the main document.
- Information or illustrations must not permit the identification of patients, and written informed consent for publication must be sought for any photograph.

Tables should be embedded in the main document or submitted as separate files, but if tables are submitted separately, please note where it is suitable in the main text. Tables are limited to six tables. All tables should be numbered consecutively in the order they are used to within the main text. Tables legends should be listed at the end of the main document.

References

The references used in the article must be written in parenthesis at the end of the sentences. References should be numbered in the order they appear in the text and placed at the end of the article. References must contain surnames and initials of all authors, article title, name of the journal, the year, and the first and last page numbers. Articles with 6 or more authors 'et al.' are mixed with the first three authors. Abbreviations should be according to index Medicus.
Authors must add the DOI (Digital object identifier) at the end of each reference.

For Examples;
Article in journal: 1. Tasci A, Tugcu V, Ozbay B, Mutlu B, Cicekler O. Stone formation in prostatic urethra after potassium-titanyl-phosphate laser ablation of the prostate for benign prostatic hyperplasia. J Endourol 2009;23:1879-81. https://doi.org/10.1089/end.2008.0596
For Books: 1.Günalp İ: Modern Üroloji. Ankara: Yargıçoğlu matbaası, 1975. Chapters in books: Anderson JL, Muhlestein JB. Extra corporeal ureteric stenting during laparoscopic pyeloplasty. Philadelphia: W.B. Saunders; 2003. p. 288-307
For website; Gaudin S. How moon landing changed technology history [Internet]. Computerworld UK. 2009 [cited 15 June 2014]. Available from: http://www.computerworlduk.com/in-depth/it-business/2387/how-moon-landing-changed-technology-history/
For conference proceeding; Proceedings of the Symposium on Robotics, Mechatronics and Animatronics in the Creative and Entertainment Industries and Arts. SSAISB 2005 Convention. University of Hertfordshire, Hatfield, UK; 2005.
For Thesis; Ercan S. Venöz yetmezlikli hastalarda kalf kası egzersizlerinin venöz fonksiyona ve kas gücüne etkisi. Suleyman Demirel University Faculty of Medicine Sports Medicine Department Thesis. Isparta: Suleyman Demirel University. 2016.
Retraction or Reject; Manuscript Retraction: For other reasons, authors may withdraw their manuscript from the journal with a written declaration.

Manuscript Reject

The manuscripts which are not accepted to be published are rejected with explanations.

AFTER ACCEPTANCE

If the manuscript is accepted, the acceptance letter is sent within two weeks, the last version of the manuscript is sent to the author for the last corresponding. The journal owner and the editorial board are authorized to decide which volume of the accepted article will be printed.
Authors may publish their articles on their personal or corporate websites by linking them to the appropriate cite and library rules.

Peer Review Process
Yayın Değerlendirme Süreci

Çift-Kör Değerlendirme Süreci

1. Makale Başvurusu

İlgili yazar, makalesini Dergipark çevrimiçi sistemi aracılığıyla dergiye gönderir.

2. Editöryal Değerlendirme

Editörlük, ilgili makalenin derginin yazım kurallarına göre düzenlenip düzenlenmediğini kontrol eder. Bilimsel içeriği bu aşamada değerlendirmez.

3. Editör tarafından değerlendirme

Editör, makalenin orijinal olup olmadığını denetler. Değilse, makale ret edilerek süreç tamamlanır.

4. Hakem Daveti

Editör, makalenin bilimsel içeriğinin değerlendirilmesi için konu ile ilgili hakemlere davet gönderir. Genellikle 2 hakeme davet gönderilir. İlgili yazıyı hakemlerden birisi ret diğeri kabul ettiği takdirde, bölüm editörü uygun görürse üçüncü bir hakemin incelemesi için davetiye gönderebilir.

5. Davete Yanıt

Seçilen hakemler, daveti gönderilen yazıyı kendi uzmanlıklarına, çıkar çatışmalarına ve kullanılabilirlik durumlarına karşı gizli olarak değerlendirir. Daha sonra kabul veya reddetmektedirler.

6. İnceleme Süreci

Hakem, makaleyi çeşitli açılardan değerlendirdikten sonra (15 gün içerisinde) eleştiri ve önerilerini içeren hakem değerlendirme formunu editöre gönderir. Major veya minör revizyonlar sonrasında hakem yazıyı tekrar değerlendirmek istemiş ise öneri ve eleştiriler yazarlara iletilerek düzeltilmiş yazıyı tekrar sisteme yüklemeleri istenir. Bu süreç hakemin kabul veya ret cevabı verene kadar devam eder.

7. Derginin Değerlendirme Süreci

Bölüm Editörü, genel bir karar vermeden önce geri gönderilen tüm değerlendirmeleri dikkate alır. Hakem değerlendirme sonuçları çok farklıysa, editör bir karar almadan önce fazladan bir fikir edinmek için ek bir inceleme isteyebilir.

8. Kararın İletilmesi

Bölüm Editörü, yazı hakkındaki son kararına hakem isimleri gizlenerek hakem raporlarını da ekler ve yazara çevrimiçi sistem ve e-mail aracılığı ile gönderir.

9. Sonraki Adımlar

Makale kabul edilirse, dil editörüne gönderilir. Bu aşamalardan sonraki adımlar;

- Son kopya gönderisi
- Mizanpaj
- Düzeltmeler
- Yayınlanacak gönderilerin erken baskı olarak web sayfasına yerleştirilmesi
- Sayı oluşturulması
- İçindekiler sayfası düzenlenmesi
- Web sitesinde sayı olarak yayınlanması ve baskı

**Kurum içi değerlendirme sürecinde; çift kör değerlendirme sürecindeki adımlar izlenmektedir.*

The Double-Blind Peer Review Process

1. Submission of Paper

The corresponding author submits the paper via Dergipark online system to the journal.new

2. Editorial Office Assessment

Editorial Office checks the paper's composition and arrangement against the journal's Author Guidelines to make sure it includes the required sections and stylizations. The quality of the paper is not assessed at this point.

3. Appraisal by the Editor

Editor checks that the paper is appropriate for the journal and is sufficiently original and interesting. If not, the paper may be rejected without being reviewed any further.

4. Invitation to Reviewers

Editor sends invitations to individuals he or she believes would be appropriate reviewers. As responses are received, further invitations are issued, if necessary, until the required number of acceptances is obtained – commonly this is 2.

5. Response to Invitations

Potential reviewers consider the invitation as anonymous against their own expertise, conflicts of interest and availability. They then accept or decline. If possible, when declining, they might also suggest alternative reviewers.

6. Review is Conducted

The reviewer sets time aside to read the paper several times. The first read is used to form an initial impression of the work. If major problems are found at this stage, the reviewer may feel comfortable rejecting the paper without further work. Otherwise they will read the paper several more times, taking notes so as to build a detailed point-by-point review. The review is then submitted to the journal, with a recommendation to accept or reject it – or else with a request for revision (usually flagged as either major or minor) before it is reconsidered.

7. Journal Evaluates the Reviews

The Section Editor considers all the returned reviews before making an overall decision. If the reviews differ widely, the editor may invite an additional reviewer so as to get an extra opinion before making a decision.

8. The Decision is Communicated

The Section Editor sends a decision email to the author including any relevant reviewer comments as anonymous.

9. Next Steps

If accepted, the paper is sent to language Editor. If the article is rejected or sent back for either major or minor revision, the Section Editor should include constructive comments from the reviewers to help the author improve the article. At this point, reviewers should also be sent an email or letter letting them know the outcome of their review. If the paper was sent back for revision, the reviewers should expect to receive a new version, unless they have opted out of further participation. However, where only minor changes were requested this follow-up review might be done by the Section Editor. After these;

- Copyedit submission
- Layout
- Corrections
- Publishing the submissions on the web page as early print
- Creating issues
- Organize Table of Contents
- Publishing the issue on the web page and printing hardcopy

**We are applying the same steps on The Double-Blind Peer Review Process when we got the in-house submission.*

Prof.Nurettin Oktel St
Lale Palas Apt 10/2
Sisli / Istanbul
Türkiye
T: +90 541 710 34 05
e-mail: endouroloji@endouroloji.org.tr
http://endouroloji.org.tr