

## Ureterorenoscopy with Stenting and Its Effect on Female Sexual Function

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**Purpose:** Various etiological factors have been studied which negatively affect female sexual function, but the effects of ureteroscopic stone surgery on women's sexual dysfunction remain unknown. The aim of this study was to investigate the effect of ureteroscopic stone surgery with postoperative stenting on female sexual function.

**Materials and Methods:** This study included 30 sexually active female patients who underwent ureteroscopic stone surgery with JJ stenting (study group) and 26 age-matched female patients with ureteral stone surgery without JJ stenting (control group). Sexual function was assessed at preoperative and at the first and 3rd months postoperative using the Female Sexual Function Index. Overall satisfaction in relation to the age, operation time, presence of stents, body mass index, educational status, previous operations, income status, and psychogenic status was evaluated.

**Results:** Sexual function was adversely affected by ureteroscopic stone surgery with JJ stenting; but psychogenic, educational and income status remained stable. Mean individual female sexual function subscores were statistically significant between the study and control groups, but the differences in the mean Beck scores minimally improved between the two groups at preoperative ( $p = 0.19$ ) visit, whereas first month ( $p = 0.08$ ) and third month ( $p = 0.31$ ) of postoperative controls were deteriorated but the differences were not statistically significant, respectively.

**Conclusion:** Ureterorenoscopy with JJ stenting has considerably negative effects on female sexual function. JJ stenting causes temporary sexual deterioration in women and it generally ceases at the end of the 3rd month after ureteroscopic surgery. Therefore, JJ stenting should be avoided or used for as short a time as possible. If JJ stenting is inevitable, patients should be warned about a temporary decline in their sexual function during the first month of the operation that resolves at most in three months.

**Keywords:** Female sexual function, ureterorenoscopy, JJ catheterization.

## INTRODUCTION

Sexuality plays an important role in an individual's quality of life. Female sexuality is a complex function encompassing interactions between the nervous, endocrine, and vascular systems, as well as a variety of structures involved in sexual excitement, intercourse, and satisfaction<sup>(1)</sup>. Psychological, biological and social factors mostly affect women's sexuality<sup>(2,3)</sup>. This may, in turn, cause emotional stress and affect a woman's well-being and social interactions.

Urinary stone disease is a common problem. Among the general population, there is a 10.2% lifetime risk of developing the urinary stone disease, with peak incidence occurring when individuals are 20–40 years old<sup>(4)</sup>. The treatment strategy for the urinary stone disease should be based on stone size, localization and number of stones, anatomic properties of the patient and the surgeon's experience. Ureteroscopy (URS) and percutaneous nephrolithotomy (PNL) are key components of surgical removal of stones in all parts of the kidneys and ureter<sup>(5)</sup>. In addition to classical methods such as shock wave lithotripsy (SWL) or open surgeries, in recent years, new surgical techniques have been developed to address this condition. These techniques include flexi-

ble ureteroscopy (FURS), rigid ureteroscopy or laparoscopic procedures, and are used when other treatment methods fail. Rigid ureteroscopy is the most preferred technique for ureteral stones among urologists.

Generally, it is difficult to conduct an assessment of a woman's sexual function, and there is a limited number of studies in the literature addressing the issue of sexual function among women<sup>(6)</sup>. Many studies have focused on various etiological factors which negatively affect female sexual function<sup>(7-10)</sup>. However, there is currently no evidence-based data in the literature concerning how women's sexual function may be affected by ureteroscopic stone surgery. The present study uses the context of evidence-based medicine to assess whether URS with stenting was associated with postoperative female sexual dysfunction (FSD).

## MATERIALS AND METHODS

This clinical study was prospectively designed for consecutive patients referred for ureteroscopic stone surgery over a period of three months. The primary aim was to evaluate the effects of ureteroscopic stone surgery on female sexual function for three months postoperative. Secondary aims were the assessment of effects

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**Table 1.** Female Sexual Function Index Domain Scores and Full Scale Score.

Domain	Questions	Score Range	Factor	Minimum score	Maximum score
Desire	1,2	1-5	0.6	1.2	6
Arousal	3-6	0-5	0.3	0	6
Lubrication	7-10	0-5	0.3	0	6
Orgasm	11-13	0-5	0.4	0	6
Satisfaction	14-16	0 (or 1)-5	0.4	0.8	6
Pain	17-19	0-5	0.4	0	6
Full Scale Score Range				2	36

of body mass index (BMI), JJ catheter time, psychogenic aspect, stone size, income status, and educational status of female sexual function.

#### Patient Selection and Evaluation

Inclusion criteria were being female older than 18 years, a presence of regular sexual activity, an absence of prior URS history, impaired renal function, radical pelvic surgery, prior pelvic radiotherapy before, and a presence of ureteral stones resistant to medical propulsive treatment despite 4–6 weeks waiting period or shock wave lithotripsy. From June to December 2015, 30 female patients with ureteral stones were enrolled in the study. These women comprised the study group and 26 age-matched female patients who underwent ureteral stone surgery without JJ stenting were served as the control group. This sample size was determined based on a power analysis. After obtaining approval of the Ethics Committee from Ondokuz Mayıs University (B.30.2.ODM.0.20.08/1780), all of the patients were informed about the study and informed consent was obtained from all study participants. Due to ethical concerns, patients were informed about the study and surgical procedure preoperatively. The female sexual function was evaluated using the Turkish-version of the Female Sexual Function Index (FSFI), which consists of 19 questions validated by the Turkish Society of An-

drology<sup>(11)</sup>. Higher FSFI scores indicate better sexual functioning. Within the individual domains, a domain score of zero indicates that the respondent reported having no sexual activity during the past month. "Factors" have been created for all domains. The factors for desire, arousal, and lubrication and orgasm and satisfaction are 0.6, 0.3, and 0.4, respectively. Individual scores of the domains were multiplied by the corresponding domain factor. The total scale score varied from 2 to 36 (Table 1). The normal cut-off value was assumed to be equal to or greater than 25. If a respondent's total scale score was below this value, sexual dysfunction was assumed.

Satisfaction in relation to age, operation time, psychogenic status, stent durations, BMI, educational status, previous operations, income status, localization of the stone and stone-free rates was recorded. The Beck depression scale, which consists of 21 items validated from 0 to 3, was used to assess psychological status.<sup>(12)</sup> The psychological state of each patient was classified as minimal depression (0–9 points), mild depression (10–16 points), moderate depression (17–29 points) and severe depression (30–63 points).

#### Surgical Technique

Once sterile urine was proved, a plain kidney-ureter-bladder (KUB) was obtained on the morning of the

**Table 2.** Demographic Characteristics of the Patients.

Variable	P-value		
No. of the patients	30	26	
Age (year), mean± SD (min-max)	41.9 ± 7.5 (22-51)	39.7 ± 9.3 (25-58)	0.25
Body mass index (kg/m <sup>2</sup> )	29.1 ± 5.8 (21.3-44.9)	27.8 ± 4.0 (18.4-33.3)	0.19
Stone burden (mm <sup>2</sup> )	66.7 ± 39.4	71.2 ± 21.6	0.09
The mean hospital stay (hours)	38.4 ± 10.8 (24-58)	31.2 ± 5.4 (24-48)	0.07
JJ stay time (days)	15.7 ± 2.4 (14-21)	-	-
Monthly Income (TL)	1083.3 ± 951.3 (0-3000)	1142.2 ± 526.1 (0-3000)	0.12
Education (n/%)			
Primary	23 (76.6)	21 (70.0)	
High school	2 (6.7)	4 (13.3)	

**Table 3.** The mean FSFI subdomains and relationship between Study and Control groups

FSFI Subdomains (mean±SD)		Preoperative	Postoperative 1st month	Postoperative 3rd month
Desire	Study gr	3.4 ± 1.4	3.2 ± 1.6	3.8 ± 1.3
	Control gr	3.4 ± 1.6	3.3 ± 1.5	3.7 ± 1.4
Arousal	Study gr	1.8 ± 1.1	2.1 ± 1.8*	2.8 ± 1.6
	Control gr	2.0 ± 0.9	2.6 ± 1.7	3.2 ± 1.4
Lubrication	Study gr	1.9 ± 1.8	1.8 ± 2.2	2.8 ± 1.8
	Control gr	1.8 ± 2.2	2.7 ± 1.2	2.8 ± 1.4
Orgasm	Study gr	1.6 ± 1.9	2.1 ± 1.6*	2.8 ± 1.2
	Control gr	1.8 ± 1.4	2.6 ± 1.4	2.8 ± 1.8
Satisfaction	Study gr	1.8 ± 1.4	2.6 ± 1.3*	3.4 ± 1.8
	Control gr	2.0 ± 1.6	3.1 ± 1.2	3.4 ± 1.6
Pain	Study gr	2.9 ± 1.8	2.8 ± 1.6*	2.1 ± 1.8
	Control gr	2.7 ± 1.6	2.1 ± 1.2	2.2 ± 0.8
Total	Study gr	14.5 ± 9.6	12.8 ± 6.8*	17.7 ± 5.4
	Control gr	13.2 ± 7.4	16.1 ± 5.1	18.2 ± 5.8
Sexual Dysfunction (%)	Study gr	18.2 ± 5.8	53.3	56.8
	Control gr	70.9*	62.4	57.6

\* $p < 0.05$ 

surgery, and all the patients underwent cystoscopy. Following the guide-wire catheter placement into the ureter under scopic vision, a 7.5 F rigid ureteroscope was introduced for stone fragmentation using laser lithotripter. The ureteral catheter was placed into the ureter at the end of the procedure. Retrograde pyelogram was routinely performed to rule out any extravasation after the procedure. JJ stenting was done for high volume stones, solitary kidney or proximally located stone diseases. All the patients were closely followed with KUB and ultrasound for assessment of residual stones and obstruction. A urine culture was repeated in the first and third postoperative controls. At first and 3rd month controls, FSFI, and Beck depression scales were repeated and recorded prospectively.

Statistical analysis was performed using SPSS software, version 15. Data were presented as mean±standard deviation (SD) and frequency (%). The Shapiro-Wilk test was used to analyze normal distribution assumptions of the quantitative outcomes. To compare two independent groups, we used the Mann-Whitney *U* test for nonnormal data. Results were evaluated using the nonparametric Kruskal-Wallis test for comparisons

between groups. To compare two groups, we used the paired sample *t* test. Pearson's chi-square and Fisher's exact tests were used for comparisons of percentages. A *p* value of less than 0.05 was considered statistically significant.

## RESULTS

The mean ages of the patients in the study and control groups were  $41.9 \pm 7.5$  (22–51) and  $39.7 \pm 9.3$  (25–58) years ( $P = .25$ ); the mean BMIs were  $29.1 \pm 5.8$  (21.3–44.9) and  $27.8 \pm 4.0$  (18.4–33.3) kg/m<sup>2</sup> ( $P = .19$ ). The mean hospital stays were  $38.4 \pm 10.8$  and  $31.2 \pm 5.4$  hours in the study and control groups, respectively ( $P = .07$ ). The mean JJ stay time was  $15.7 \pm 2.4$  (14–21) days in the study group. The other demographic data and perioperative variables have been presented in **Table 2**. The mean preoperative total FSFI scores were  $14.5 \pm 9.6$  and  $13.2 \pm 7.4$ , the mean 1st postoperative total FSFI scores were  $12.8 \pm 6.8$  and  $16.1 \pm 5.1$ , and 3rd postoperative total FSFI scores were  $17.7 \pm 5.4$  and  $18.2 \pm 5.8$  in the study group and control group, respectively. The mean total FSFI scores were statistically significant between groups at 1st postoperative month ( $P <$

**Table 4.** Beck depression scale and sexual dysfunction rate variations in both groups.

Beck's depression score	Preoperative	Postoperative 1st month	Postoperative 3rd month
Study group	6.1±1.3	4.1±1.3	4.1±1.3
Control group	4.9±1.8	5.6±1.7	5.2±0.8
<i>p</i> value	0.19	0.08	0.31

.05), whereas preoperative and 3rd postoperative total FSFI scores were not ( $P > .05$ ). The mean individual first postoperative arousal, orgasm, and satisfaction subdomains statistically decreased, and pain subdomain increased in the study group compared to control group ( $P < .05$ ). All the subdomains were similar at preoperative and 3rd postoperative controls between two groups ( $P > .05$ ) (Table 3).

Sexual dysfunction rates were 53.3%, 70.9% and 56.2% in the study group and 56.8%, 62.4 and 57.6% in the control group at preoperative and at 1st and 3rd postoperative months (Table 3). Sexual dysfunction rate was significantly increased in the study group at postoperative 1st month ( $P = .02$ ), whereas preoperative ( $P = .06$ ) and postoperative 3rd month controls were not ( $P = .08$ ). The mean Beck depression scores at preoperative, 1st and 3rd month postoperative in controls were  $6.1 \pm 1.3$ ,  $4.1 \pm 1.3$ , and  $4.1 \pm 1.3$ , and  $4.9 \pm 1.8$ ,  $5.6 \pm 1.7$ , and  $5.2 \pm 0.8$  in the study and control groups, respectively. There were no statistically significant differences between groups ( $P > .05$ ). In the control group, the mean Beck score was  $4.2 \pm 1.1$ . When the Beck scores were compared, there was no statistically significant difference between the study and control group ( $P = .31$ ) (Table 4).

## DISCUSSION

Descriptive epidemiological data were shown in the literature indicate that 40–67.9% of adult women have at least one manifesting sexual dysfunction, and medical interventions may provoke this condition<sup>(13–15)</sup>. Surgical interventions may cause FSD, and sexual disturbance may have a negative effect on physical and mental health<sup>(16)</sup>. In the current study, sexual dysfunction rates increased at postoperative 1st month and then normalized to the preoperative level at the 3rd month, compared to control group (53.3%) (Table 3). Deterioration of sexual health in women after ureteroscopy and an improvement at the 3rd month evaluation has been attributed to lower urinary access and ureteral stent use<sup>(17–19)</sup>. Our findings on FSD supported that the study group was much more affected due to JJ catheterization. Although we do not routinely prefer JJ catheterization, it is mandatory to insert a catheter in certain circumstances, such as high volume stones, solitary kidney, urine leakage due to ureteral trauma or proximally located stone diseases. With this study, we are encouraged to use JJ stenting for limited periods or not to insert JJ catheter, if possible. Patients often suffer from symptoms related to JJ stents, such as intolerance to the stent, depression, severe stent-related pain, hematuria, or urgency due to the shape of the JJ catheter, rather than the presence of urinary infection<sup>(20)</sup>. Although significant improvements have been achieved in regard to stent materials, a proportional comfort has not been observed to date.

None of the patients were stentized due to urine extravasation. Hematuria was observed in half of the patients, and urgency in one-third in the postoperative period. Minimality or absence of these symptoms in the preoperative and third postoperative periods suggests that the catheter can cause itself urgency in patients by chronic irritation. Urgency can be managed using anticholinergic agents, but sometimes it can be difficult to cope with this symptom during the early postoperative period<sup>(21)</sup>. In such cases, early withdrawal of the JJ catheter

may aid in the early relief of urgency. Moreover, using a one-day ureteral catheter instead of a JJ catheter for uncomplicated and thoroughly disintegrated stones may help prevent urgency.

The mean time of stent removal was  $15.7 \pm 2.4$  (14–21) days, and it was kept as short as possible in order to avoid early complications.

Anxiety and depression typically become prominent with diseases provoked by painful crises and have a negative impact on an individual's psychological status<sup>(22)</sup>. The relationship between urological stone management and anxiety or depression was shown to cause increased anxiety<sup>(23)</sup>. Rather than short-term treatment of the benign diseases, anxiety and depression are shown to be higher in chronic conditions such as malignant diseases<sup>(24)</sup>. In this study, we found no significant difference using Beck's depression score to evaluate the mental status of the patients ( $P = .31$ ). This finding suggested that FSD is not affected by the psychological status of the patients (Table 4). Contrary to our results, Joshi et al. stated that significant morbidity due to JJ stents might provoke emotional and physical alterations in patients<sup>(19)</sup>. It is reasonable that patients may experience a temporary decline in their sexual function in the postoperative period. This study showed once again that while urologists were focusing on protecting renal function from adverse effects of ureteral stones in daily practice, and exert utmost efforts should be taken for patients' social and sexual life in the postoperative period. For this reason, we think that sufficient preoperative information should be given and JJ stenting should be minimized as much as possible.

The relationship between BMI and FSD remains controversial in the literature<sup>(16, 25)</sup>. Our results showed no relationship between FSD and BMI ( $P = .19$ ). Monthly income and educational status have been shown to be predictive factors for FSD in women, with a reported 2.54 fold increased the chance of FSD in low-income women<sup>(26–28)</sup>. Contrary to the literature, we found no correlation between sexual dysfunction and monthly income or educational status. This can be explained by the close proximity of monthly income levels between patients ( $P > .05$ ).

## CONCLUSIONS

Ureterorenoscopy with JJ stenting has a considerable negative effect on FSD. Although the deterioration of sexual function is temporary and generally ceases at the end of the 3rd month after ureteroscopic surgery, JJ stents should be avoided whenever possible. If JJ stenting is necessary, patients with stent should be informed that they may have some degrees of sexual dysfunction during the first month of the operation that resolves at most in three months. In addition, if JJ catheterization proves necessary the indwelling should be kept as short as possible.

## CONFLICTS OF INTEREST

The authors report no conflict on interest.

## REFERENCES

1. Rao TS, Nagaraj AK. Female sexuality. Indian J Psychiatry. 2015; 57(Suppl 2):S296-302.
2. Hosseini L, Iran-Pour E, Safarinejad MR. Sexual function of primiparous women after



- elective cesarean section and normal vaginal delivery. *Urol J*.2012; 9:498-504.
3. Mezzich JE, Hernandez-Serrano R. In: *Psychiatry and Sexual Health – An Integrative Approach*. Lanham: Jason Aronson; 2006. Epidemiology and public health considerations; pp. 33–43.
4. Tseng TY, Preminger GM. Kidney stones. *BMJ Clin Evid*. 2011; 2011. pii: 2003.
5. Türk C, Petřík A, Sarica K, et al. EAU Guidelines on Interventional Treatment for Urolithiasis. *Eur Urol*. 2016; 69:475-82.
6. Eryildirim B, Tuncer M, Kuyumcuoglu U, Faydaci G, Tarhan F, Ozgul A. Do ureteral catheterisation procedures affect sexual functions? A controlled prospective study. *Andrologia*. 2012; 44:419–23.
7. Carrilho PJF, Vivacqua CA, de Godoy EP, et al. Sexual dysfunction in obese women is more affected by psychological domains than that of non-obese. *Rev Bras Ginecol Obstet*. 2015; 37:552-8.
8. Scheepe JR, Alamyar M, Pastoor H, Hintzen RQ, Blok BF. Female sexual dysfunction in multiple sclerosis: Results of a survey among Dutch urologists and patients. *Neurourol Urodyn*. 2017; 36:116-20.
9. Frost DM, Meyer IH, Schwartz S. Social support networks among diverse sexual minority populations. *Am J Orthopsychiatry*. 2016; 86:91-102.
10. Oren A, Megiddo E, Banai S, Justo D. Sexual dysfunction, cardiovascular risk factors, and inflammatory biomarkers in women undergoing coronary angiography. *J Women Aging*. 2015; 22:1-8.
11. Rosen R, Brown C, Heiman J, et al. The Female Sexual Function Index (FSFI) *J Sex Marital Ther*. 2000; 26:191–208.
12. Beck AT, Ward CH, Mendelson M, Mock J, Erbaugh J. An inventory for measuring depression. *Arch Gen Psychiatry*. 1961; 4:561-71.
13. Lewis RW, Fugl-Meyer KS, Corona G, et al. Definitions/Epidemiology/Risk Factors for Sexual Dysfunction. *J Sex Med*. 2010; 7:1598–607.
14. Oksuz E, Malhan S. Prevalence and Risk Factors for Female Sexual Dysfunction in Turkish Women. *J Urol*. 2006; 175:654-8.
15. Laumann EO, Paik A, Rosen RC. Sexual dysfunction in the United States: prevalence and predictors. *JAMA*. 1999; 281:537-44.
16. Smith AM, Patrick K, Heywood W, et al. Body mass index, sexual difficulties and sexual satisfaction among people in regular heterosexual relationships: a population-based study. *Intern Med J*. 2012; 42:641-51.
17. Joshi HB, Stainthorpe A, MacDonagh RP, Keeley FX, Jr, Timoney AG. Indwelling ureteral stents: evaluation of symptoms, quality of life and utility. *Journal of Urology*. 2003; 169:1065–9.
18. Haleblan G, Kijvikai K, de la Rosette J, Preminger G. Ureteral stenting, and urinary stone management: a systematic review. *J Urol*. 2008; 179:424-30.
19. Joshi HB, Newns N, Stainthorpe A, MacDonagh RP, Keeley FX Jr, Timoney AG. Ureteral stent symptom questionnaire: development and validation of a multidimensional quality of life measure. *J Urol*. 2003; 169:1060.
20. Kogan MI, Mojsjuk JG, Shkodkin SV, Sajdulaev DA, Idashkin JB. Effectiveness of ureteral stents with nanostructured coating in renal transplantation (preliminary results). *Urologia*. 2015; 1:58-61.
21. Lee YJ, Huang KH, Yang HJ, Chang HC, Chen J, Yang TK. Solifenacin improves double-J stent-related symptoms in both genders following uncomplicated ureteroscopic lithotripsy. *Urolithiasis*. 2013; 41:247-52.
22. Diniz DH, Blay SL, Schor N. Anxiety and depression symptoms in recurrent painful renal lithiasis *Braz J Med Biol Res*. 2007; 40:949-55.
23. Brown SM. Quantitative measurement of anxiety in patients undergoing surgery for renal calculus disease. *J Adv Nurs*. 1990; 15: 962-70.
24. Alacacioğlu, Öztöpe I, Yılmaz U. The Effect of Anxiety and Depression on Quality of Life in Turkish Non Small Lung Cancer Patients. *Tur Toraks Der*. 2012; 13: 50-5.
25. Mozafari M, Khajavikhan J, Jaafarpour M, et al. Association of Body Weight and Female Sexual Dysfunction: A Case-Control Study. *Iran Red Crescent Med J*. 2015; 17: e24685.
26. Diehl A, Silva RL, Laranjeira R. Female sexual dysfunction in patients with substance-related disorders. *Clinics (Sao Paulo)*. 2013; 68:205-12.
27. Worly B, Gopal M, Arya L Sexual dysfunction among women of low-income status in an urban setting. *Int J Gynaecol Obstet*. 2010; 111:241-4.
28. Laumann EO, Paik A, Rosen RC Sexual dysfunction in the United States: prevalence and predictors. *JAMA*. 1999; 81:537-44.