

The Impact of the Double J Stent on Health and Sexual Life

Cristian MARES^{a, b}, Petrisor GEAVLETE^{a, b, c}, Dragos GEORGESCU^{a, b, c}, Razvan MULTESCU^{a, c}, Bogdan GEAVLETE^{a, b, c}

^a“Carol Davila” University of Medicine and Pharmacy, Bucharest, Romania

^b“Saint John” Emergency Clinical Hospital, Department of Urology, Bucharest, Romania

^cSanador Hospital, Bucharest, Romania

ABSTRACT

Double J stents are commonplace tools used in modern urology, serving as a vital aid in the drainage of the upper urinary system. Along with the numerous advantages of these catheters, numerous negative consequences have also been addressed throughout time. Among the most common symptoms associated with ureteral catheters are those associated with LUTS (lower urinary tract symptoms), such as dysuria, urinary urgency, pollakiuria, the feeling of incomplete emptying of the bladder, urinary incontinence, or even urinary tract infections (UTIs). Complications associated with sexual dysfunction, including dyspareunia and pain during sex, which can lead to erectile dysfunction or loss of orgasm, are less discussed in the literature. This small review tries to focus on the most important aspects of low urinary symptoms that affect the general quality of life and those related to the quality of sexual life, which are less discussed but of particular importance in the lifestyle of any patient with such ureteral device.

Keywords: double J stent, quality of life, sex life, sexual symptoms, lower urinary tract symptoms.

INTRODUCTION

Double J (DJ) ureteral stents are widely utilised in a large variety of urological procedures, such as open and endoscopic ureteral operations, percutaneous nephrolithotomy, pyeloplasty, as well as a preventive measure for upper urinary tract obstruction caused by multiple factors. Zimskind *et al* (1) originally documented the endoscopic implantation of permanent ureteral stents in 1967. Later,

Finney *et al* (2) presented the form of the modified device by describing the DJ stent (DJS), basically similar to the stents we know today. A DJS is an essential device for most stones treated by endourological treatments because it provides excellent urinary tract drainage and is very easy to utilise. Its primary functions include clearing obstructions in the upper urinary system caused by both intrinsic and extrinsic factors, facilitating healing after ureteral incidences or reno-ureteral anastomoses, and to prevent blockage following endourological procedures or iatrogenic ureteral

Address for correspondence:

Mares Cristian, M.D.

Postal address: Urology Department of Saint John Emergency Hospital, 13 Vitan-Barzesti Avenue, 042122, Bucharest, Romania

Tel.: +4 0745 383 552; email: dr.marescristian@gmail.com

Article received on the 22th of November 2023 and accepted for publication on the 19th of December 2023

injury (3). However, DJSts have a considerable negative influence on the patient's quality of life (QoL) and are frequently linked to side effects such as pain, urinary tract infections (UTI) or hematuria. These symptoms have a substantial impact on sexual life, general health, occupational performance in both sexes, and patients' QoL (4).

The action mechanisms of these stents are unclear; multiple factors in relation with stent characteristics are implicated. The stent implantation process was also examined (5). In 2003, Joshi *et al* discovered that 35% of patients who were sexually active experienced sexual issues as a result of an indwelling DJSt (6). Since then, questions regarding how an in-body DJSt can affect sexual function have grown. This narrative review aims to follow the current data up to now in the literature and to summarize the complications of DJ stents in relation to the sexual life of patients who wear these temporary or permanent catheters.

MATERIALS AND METHODS

This narrative review explores the multifaceted impact of the double J stent on both health and sexual life. Given the limited availability of comprehensive data in the existing literature, a rigorous cognitive evaluation of pivotal articles published over the last 15 years was undertaken to derive meaningful insights. The present study adopts a narrative review approach, aiming to synthesize and critically analyze the existing body of knowledge surrounding the effects of DJ stents. This methodological choice is particularly relevant, as the available literature lacks an extensive compilation of empirical data on this subject. To ensure the inclusion of the most relevant and influential studies, a systematic literature search was conducted across various databases. The extracted data from selected articles were subjected to a comprehensive synthesis, emphasizing the key findings related to the impact of DJ stents on health and sexual well-being.

A cognitive evaluation of the most significant articles identified via the literature review was performed. This involved a critical analysis of study design, statistical methods and the overall quality of evidence presented. By employing this approach, we aimed to provide a nuanced understanding of the existing literature and its implications for the clinical practice.

General aspects of the double J stent in relation to health status and urinary symptoms

It is unclear what the pathophysiology of stent-related symptoms is. Studies have looked into a number of variables linked to stent length, diameter, material, softness, position, loop integrity, and stent implantation procedure (6, 7). Many patients experience pain during stent placement. Some of the mild complications include problems with storing and/or voiding, overactive bladder-like symptoms, hematuria, and many times, pain (5). There is debate over the aetiology of stenting-related symptoms. The smooth muscle spasm in the bladder and activation of alfa 1 D receptors found in the bladder wall is one of the mechanisms involved in these symptoms (8, 9).

In relation with DJSt placement, more than 75% of patients experience pain, which is typically located in the lower back and is related to urine. With detrusor contraction comes an increase in intravenous pressure, which can be conveyed to the renal unit by reflux and result in flank pain (10). The distal coil's localized bladder irritation might cause suprapubic pain, or it can be a subsequent symptom of an underlying condition like infection or encrustation (11). Among the important complication of DJSt placement, UTIs are more likely to occur in these patients. Antibiotics should therefore be given as a preventative measure before stent installation and removal, as for any endourological procedure (12). Bacteria frequently colonize the ureteral



FIGURE 1 (a, b). Examples of DJ stents' coil encrustation (authors' collection)

stent because it behaves like a foreign entity, usually within the first three weeks of stent installation; it is considered that ureteral stent colonization is almost always present in patients with permanent stents and in about 70% of individuals with temporary stents (13). The process of stent associated UTI and stent encrustation has been linked to biofilm growth on its surface as a key point. Controversial opinions have been expressed regarding how biofilms affect stent morbidity, but the relationship between this and UTIs is well known, undoubtedly affecting the patients' QoL (14). The indwelling time is the most critical risk factor for encrustation, which might make removal difficult or impossible. In the case of ureteral injury, encrustation and cellular adhesion can cause poor recovery by promoting urinary tract infection, additionally having a negative impact on the patients' QoL (15, 16). Examples of DJS encrustation is represented in Figure 1.

The end of voiding is typically marked by painful voiding and lumbar pain, similar to renal colic in a patient with a DJS placement. When the bladder coil crosses the midline or creates an incomplete loop, it is thought to be the cause of the pain experienced during that time (17). According to a study conducted by Al-Kandari, that describes a randomized clinical trial, patients' QoL is significantly impacted by urgency and pain of urination, which are more common with longer stents (18). The movement of the catheter at the ureteral level and the corresponding ureteral spasm are key factors in renal pain. The distention of the renal capsule brought on by urine reflux through DJ is assumed to be the source of this pain (19). According to a study by Joshi *et al*, hematuria becomes prominent after 7 to 10 days and it gradually lessens over the duration of stent use. Hematuria may have a connection to specific physical exercises and patient's movements, particularly cardio physical activity. Hematuria can be prevented by setting activity limits and avoiding overexertion, which can cause it. If patients have a certain underlying condition that requires anticoagulant therapy, even a small amount of irritation or trauma from the catheter might cause the presence of blood in urine. For these patients, an increase in urine production and a sufficient hydration supply are crucial factors in preventing additional complications (20, 21).

Patients with stents may tolerate the proximal coil's placement better if it is placed in the upper pole of the kidney as opposed to the renal pelvis (22). Stents that cross the bladder's midline are said to significantly and negatively affect the related discomfort. Therefore, selecting the proper stent length may help to reduce stent-related discomfort (23). It was expected that the distal coil of the stent should not cross the bladder midline in a prospective randomized control experiment (24).

The bladder coil's mechanical stimulus is thought to be the source of frequency in patients with DJ stents. It affects more than half of patients, along with urgency. The absence of concomitant nocturia in the case of daytime frequency suggests that mechanical stimulation during the day is related to physical activity and/or awareness of this stimulation, which would not be significant at night. Frequency volume charts provide an objective evaluation that supports this notion (20). Researchers recently confirmed that stent discomfort may be impacted by stent displacement during physical activity. In a limited trial including only six patients, researchers observed bladder or renal coil movement of up to 2.5 cm and linked changes in patient posture to proximal ureter bowing (11). The presence of the stent, which may also reveal or increase pre-existing subclinical detrusor overactivity, is regarded to be the direct cause of urgency, having a negative impact on the general state of health.

The DJ stent in relation to sexual life

A vital part of a person's life is sexual engagement. Sexual health is defined by the World Health Organization (WHO) as "social well-being, mental, emotional and a good physical state in relation to sexuality" (25). In addition to providing a means of enjoying pleasure and physical release, sexuality also enhances longevity and quality of life (26). The QoL is significantly impacted by the decline in the sexual realm. The use of DJ stents can result in a range of multiple sexual symptoms, including pain during sex, ejaculodysnia, dyspareunia, erectile dysfunction and decreased libido, along with many others. A study conducted by Leibovici *et al* (27) showed that 62.6% of sexually active patients experienced discomfort during sex (32% of men), dyspareunia (62% of women), ejaculodysnia (46% of men), decreased libido (38% of men and 66% of

women), erectile dysfunction (20%), and worry that sex might have a damage effect on the DJ stents (54% of women).

Despite being impacted by stents, sexual health may have been seen as a less serious issue. With only seven days of stent implantation, it initially appears to be a minor issue, but it becomes significant as the stent lasts. Stents appeared to have an effect on overall sexual satisfaction in addition to the discomfort experienced during sexual activity. Almost 40% of patients reported having mild sexual dysfunction, 60% said their work performance had significantly declined, and more than 80% of patients reported pain that interfered with their everyday life. In a study that showed that 90% of patients were affected by the pain of daily living, doctors were able to detect urine incontinence in 91.7% of cases. More than 10% of research participants who reported having active sex lives said their DJ stents had an unsettling impact on their sexual activity; the proportion of people who reported having impaired sexual function was determined to be 37.5%. Patients typically experienced pain in the groin and flank areas during sexual activity (28). A total number of 30 men and 20 women with DJ stents were monitored in a study conducted by M.C. Sighinolfi *et al*, that was published in the *Journal of Urology of the American Urological Association*. Three surveys, including the International Prostate Symptom Score, the International Index of Erectile Function-5 for men, and the Female Sexual Function Index for women, were given before stenting and 45 to 60 days after stent positioning. It was found that both male and female test subjects' sexual lives were compromised by ureteral stents. The main concern for men was erectile dysfunction, which was presumably caused by symptoms of the lower urinary tract. In contrast, psychological issues connected to stents appeared to seriously hinder female sexuality (29). □

DISCUSSIONS

Ureteral stents are a common practice in modern urology, but many times they can lead to lower urinary tract symptoms that have a negative impact on the QoL. Treatment for ureteral stones with stents and without stents was examined in a large meta-analysis of RCTs, conducted by Wang H *et al*. Urinary infection, hematuria, discomfort, ir-

ritability, and dysuria were the most typical consequences. The stent group experienced the highest rates of dysuria (over 50%), followed by flank or voiding pain (over 30%), and irritation (around 45%). Dysuria and itchiness, two LUTS, are closely associated to sexual dysfunction (30). Sexual life appears to be affected by all stent-related disorders, including LUTS, pain, and mental illness. Junlin Lu *et al*'s latest analysis of the literature from 2020 reveals that the IIEF and FSFI are two particular questionnaires that are utilised to assess sexual function. In individuals with stents, a significant decline in sexual function was noted. However, in urology, the interest in technology was not focused on aspects of sexual life (31). Contrarily, some studies found no appreciable difference between sexual health at one month following placement and that at the fourth week following removal (32, 33).

In a study carried out by Fawzi *et al* in South Asia, it was found that both genders who had only one stented experienced a significant reduction in sexual function (34). In their study using the International Index for Erectile Function (IIEF) for men and the FSFI for women at 30 days and 90 days following the surgical intervention, Bolat *et al* found no link between URS and sexual dysfunction. They noted dysfunction at four weeks, which improved after three months, leading them to conclude that the ureteral stent was probably the cause of the difference (35).

CONCLUSIONS

Double J stents are ubiquitous devices in current urological practice, representing an indispensable aid in the drainage of the upper urinary tract. In addition to the many benefits that these catheters have, their multiple adverse effects have been discussed in specialized publications over time, among which the negative impact on both the QoL and sexual activity of urological patients with ureteral catheters are some of the most important ones. Therefore, making patients aware of these possible complications of endourological maneuvers is a real necessity that must be carried out by each individual urologist. □

Conflicts of interest: ??????????????

Financial support: ??????????????



REFERENCES

1. Zimskind PD, Fetter TR, Wilkerson JL. Clinical use of long-term indwelling silicone rubber ureteral splints inserted cystoscopically. *J Urol* 1967;97:840-844.
2. Finney RP. Experience with new double J ureteral catheter stent. *J Urol* 1978;120:678-681.
3. Ringel A, Richter S, Shalev M, Nissenkorn I. Late complications of ureteral stents. *Eur Urol* 2000;38:41-44.
4. Sighinolfi MC, Micali S, deStefani S, et al. Indwelling ureteral stents and sexual health: a prospective, multivariate analysis. *J Urol* 2007;178:229.
5. Joshi HB, Newns N, Stainthorpe A, et al. Ureteral stent symptom questionnaire: development and validation of a multidimensional quality of life measure. *J Urol* 2003;169:1060-1064.
6. Erturk E, Sessions A, Joseph JV. Impact of ureteral stent diameter on symptoms and tolerability. *J Endourol* 2003;17:59.
7. Liatsikos EN, Gershbaum D, Kapoor R, et al. Comparison of Urinary Symptoms and Ureteral Double-J Stenting symptoms related to positioning of double-pigtail stent in upper pole versus renal pelvis. *J Endourol* 2001;15:299.
8. Damiano R, Autorino R, de Sio M, Giacobbe A, et al. Effect of tamsulosin in preventing ureteral stent-related morbidity: a prospective study. *J Endourol* 2008;22:651.
9. Duvdevani M, Chew BH, Denstedt JD. Minimizing symptoms in patients with ureteric stents. *Curr Opin Urol* 2006;16:77.
10. Koproowski C, Kim C, Modi PK, Elsamra SE. Ureteral stent-associated pain: a review. *J Endourol* 2016;30:744-753.
11. Miyaoka R, Monga M. Ureteral stent discomfort: etiology and management. *Indian J Urol* 2009;25:455-460.
12. Wolf JS, Bennett CJ, Dmochowski RR, et al. Best practice policy statement on urologic surgery antimicrobial prophylaxis. *J Urol* 2008;179:1379-1390.
13. Bagues-Balanzá M, Ordaz-Jurado G, Budía-Alba A, Boronat-Tormo F. Ureteral Stents. Impact on Patient's Quality of Life. In: Soria F, Rako D, de Graaf P (eds). *Urinary Stents*. Springer, Cham. 2022. https://doi.org/10.1007/978-3-031-04484-7_5
14. Betschart P, Zumstein V, Buhmann MT, et al. Influence of biofilms on morbidity associated with short-term indwelling ureteral stents: a prospective observational study. *World J Urol* 2019;37:1703-1711.
15. Kram W, Buchholz N, Hakenberg OW. Ureteral stent encrustation. Pathophysiology. *Arch Esp Urol* 2016;69:485-493.
16. Beysens M, Tailly TO. Ureteral stents in urolithiasis. *Asian J Urol* 2018;5:274-286.
17. Rane A, Saleemi A, Cahill D, et al. Have stent-related symptoms anything to do with placement technique? *J Endourol* 2001;15:741-745.
18. Al-Kandari AM, Al-Shaiji TF, Shaaban H, et al. Effects of proximal and distal ends of double-J ureteral stent position on postprocedural symptoms and quality of life: A randomized clinical trial. *J Endourol* 2007;21:698-702.
19. Regan SM, Sethi AS, Powelson JA, et al. Symptoms related to ureteral stents in renal transplants compared with stents placed for other indications. *J Endourol* 2009;23:2047-2050.
20. Joshi HB, Okeke A, Newns N, et al. Characterization of urinary symptoms in patients with ureteral stents. *Urology* 2002;59:511-516.
21. Chew BH, Knudsen BE, Nott L, et al. Pilot study of ureteral movement in stented patients: First step in understanding dynamic ureteral anatomy to improve stent comfort. *J Endourol* 2007;21:1069-1075.
22. Liatsikos EN, Hom D, Dinlenc CZ, et al. Tail stent versus re-entry tube: A randomized comparison after percutaneous stone extraction. *Urology* 2002;59:15-19.
23. Giannarini G, Keeley FX Jr, Valent F, et al. Predictors of morbidity in patients with indwelling ureteric stents: Results of a prospective study using the validated ureteric stent symptoms questionnaire. *BJU Int* 2011;107:648-654.
24. Lee SJ, Yoo C, Oh CY, et al. Stent position is more important than α -blockers or anticholinergics for stent-related lower urinary tract symptoms after ureteroscopic ureterolithotomy: A Prospective randomized study. *Korean J Urol* 2010;51:636-41.
25. World Health Organization, Gender and human rights. https://www.who.int/reproductivehealth/topics/gender_rights/sexual_health/en/ Accessed 18 Mar 2015.
26. Sadosky R, Nusbaum M. Sexual health inquiry and support is a primary care priority. *J Sex Med* 2006;3:3-11.
27. Leibovici D, Cooper A, Lindner A, et al. Ureteral stents: morbidity and impact on quality of life. *Isr Med Assoc J* 2005;7:491-494.
28. Camtosun A, Bicer S. The impact of Double J stent on the quality of sexual life and job performance. *Clin Exp Obstet Gynecol* 2020;47:199-201.
29. Sighinolfi MC, Micali S, De Stefani S. Indwelling Ureteral Stents and Sexual Health: A Prospective, Multivariate Analysis. *J Urol* 2007;178:229-231.
30. Wang H, Man L, Li G, et al. Meta-Analysis of Stenting versus Non-Stenting for the Treatment of Ureteral Stones. *PloS One* 2017;12:e0167670.
31. Lu J, Lu Y, Xun Y, et al. Impact of Endourological procedures with or without double-J stent on sexual function: a systematic review and meta-analysis. *BMC Urol* 2020;20:13.
32. Giannarini G, Keeley FX Jr, Valent F, et al. Predictors of morbidity in patients with indwelling ureteric stents: results of a prospective study using the validated Ureteric Stent Symptoms Questionnaire. *BJU Int* 2011;107:648-654.
33. Tanidir Y, Mangir N, Sahan A, Sulukaya M. Turkish version of the Ureteral Stent Symptoms Questionnaire: linguistic and psychometric validation. *World J Urol* 2017;35:1149-1154.
34. Fawzi R, Ali Z. Association of JJ stent insertion and sexual function: A cohort study. *F1000Research* 2018;7:1978 (<https://doi.org/10.12688/f1000research.16608.1>).
35. Bolat MS, Akdeniz E, Asci R, et al. Ureterorenoscopy with stenting and its effect on male sexual function: a controlled randomised prospective study. *Andrologia* 2017;49:9.

