Original article

Development and validation of the Ureteral Stent Discomfort Test (USDT). A simple, effective, and easy-to-use tool for evaluating ureteral stent discomfort

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Abstract

Objective: To develop and validate a simple self-administered questionnaire to evaluate ureteral stent discomfort.

Materials & Methods: A pilot instrument based on the ussq was designed and structured, using the Delphi method. It was applied to 72 patients with an indwelling ureteral stent after semirigid ureteroscopy. The instrument was validated through the Cronbach's alpha coefficient and Pearson's correlation coefficient.

Results: The ureteral stent discomfort test (USDT) utilizes a Likert scale model, with 6 domains: 1-urinary symptoms, 2-pain, 3-daily life, 4-sexual life, 5-medical care/use of analgesics, and 6-quality of life, with 6, 2, 1, 1, 2, and 1 items, respectively. The more severe the symptoms, the higher the score, with a maximum score of 61 points. Validation studies made the questionnaire internally consistent (Cronbach 0.820) with good reliability (Pearson 0.850). The correlation of urinary symptoms (r = 0.929, p = 0.00), pain (r = 0.880, p = 0.00), daily life (r = 0.625, p = 0.00), and quality of life (r = 0.768, p = 0.00) of both questionnaires was statistically significant. Application time for the usdt (m = 1.8min SD = 0.76) was shorter than for the ussq (m = 8.3min SD = 0.76).

Limitations: The small sample size was a restriction. More patients are required to demonstrate the usdt's effectiveness.

Value: The questionnaire is an easy-to-use tool for the simple evaluation of ureteral stent discomfort.

Conclusions: The USDT is a simple and rapid tool, comparable to the USSQ, for evaluating ureteral stent-related symptoms.

Keywords:
USSQ, Ureteral, Discomfort, Questionnaire, Test.

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Introduction

According to the literature, more than 70% of patients with ureteral stents experience stent-related discomfort. Most of the tools for evaluating said discomfort are challenging for both the urologist and the patient, given that the majority are self-applied and there is insufficient application time.[1,2]

In addition, the design characteristics of questionnaires for evaluating ureteral stent discomfort, such as the ureteral stent symptom questionnaire (USSQ) and its validated spanish version, are often not compatible with the public healthcare systems used by patients and application time is limited because of the high volume of patients seen in public institutions.

Ureteral stent discomfort is defined as a set of urinary symptoms and alterations in sexual function, work performance, and quality of life related to having an indwelling ureteral stent.[3]

In general, there is no consensus for the description of the syndrome. It is usually associated with urinary storage symptoms, such as frequency, nocturia, urgency, pain, and altered quality of life.

Many studies have described the incidence of the main ureteral stent-related symptoms, which are: pain in the lumbar region and strangury and the urinary symptoms of frequency (50-60%), urgency (57-60%), dysuria (40%), tenesmus (76%), flank pain (19-32%), suprapubic pain (30%), incontinence, and hematuria (25%). Those symptoms are shown in Table 1.

Table 1. Symptoms

Urinary Symptoms	Pain	Symptoms that affect sexual performance or ordinary physical activities	Quality of life
Frequency	Lumbar region	Dyspareunia	Has an overall effect on quality of life
Nocturia	Strangury	Inability to perform ordinary physical activities	Effects daily activities
Urgency			
Urgency incontinence			
Stress incontinence			
Tenesmus			
Hematuria			
Dysuria			

Frequency is attributed to the mechanical stimulation exerted by the inferior loop of the stent in the bladder. Together with urgency, urinary frequency is one of the most important symptoms of ureteral stent discomfort.[4]

Statistically, ureteral stent-related symptoms have a negative impact on the patient's economy. A study found that 58% of patients had reduced work capacity due to the discomfort of the stent, and approximately half of the patients sought medical attention for the stent-related symptoms.[5]

In another study, Leibovici *et al*. reported that, in 135 patients with a stent, 45% had not been able to work for at least 2 days, for a total of 435 workdays lost.[6]

In the context of analyzing the patient with ureteral stent discomfort, there are few validated tools for objectively evaluating ureteral stent-related symptoms.

In 2003, Joshi *et al*. published the USSQ, which consists of a questionnaire that evaluates stent-related symptoms, as well as their impact on quality of life.[5] That tool has been the standard for evaluating ureteral stent-related symptoms for many years and has been validated in italian, korean, spanish, french, and other languages.

The USSQ contains 38 items, which are divided into 6 domains: urinary symptoms, pain, overall health, job performance, symptoms related to sexual performance, additional problems, and quality of life. Because there are few questionnaires for evaluating ureteral stent discomfort, the prototype has been the USSQ.[7–10]

Materials & methods

After ethical approval, a validation study was carried out in two phases. First, a pilot instrument was designed, which was based on the USSQ. It utilized the same domains and the most common symptoms reported in the literature. Both the USSQ and the pilot instrument were applied to a group of 9 patients that underwent semirigid ureteroscopy. The tests were applied on days 7 and 14, after ureteral stent placement, and on day 7, after ureteral stent extraction. The sociodemographic characteristics of the patients are shown in Table 2.

Table 2. Sociodemographic characteristics

		n	%
Socioeconomic status	Lower	12	16.67%
	Upper-lower	35	48.61%
	Lower-middle	18	25.00%
	Upper-middle	7	9.72%
Education	None	4	5.56%
	Primary	32	44.44%
	Secondary	25	34.72%
	High school	4	5.56%
	College	7	9.72%
Comorbidities	None	13	18.06%
	Diabetes	6	8.33%
	HBP	18	25.00%
	Obesity	32	44.44%
	Metabolic syndrome	3	4.17%
Type of surgery	Elective	56	77.78%
	Emergency	16	22.22%

All patients underwent semirigid ureteroscopy with the placement of a 6Fr x 24cm Cook Medical UNIVERSA stent. The pilot instrument was applied, analyzed, and corrected by the Delphi method. After the corrections were made, the pilot and the USSQ were applied to 36 patients that underwent ureteroscopy with ureteral stent placement. A total of 72 tests were carried out and the pilot instrument was compared with the USSQ, using the Pearson's correlation coefficient. The final design of the USDT is based on the Likert scale and consists of 6 domains (13 items) that evaluate: urinary symptoms, pain, daily life, sexual life, medical care and the use of analgesics, and quality of life, with 6, 2, 1, 1, 2, and 1 items, respectively. It is evaluated by the frequency of symptom presentation in each domain. The pain domain is evaluated through the Verbal Descriptive Scale validated by Heft *et al*. The score increases according to symptom severity, with a maximum score of 61 points.

Results

Validation studies showed the questionnaire to be internally consistent (Cronbach's alpha coefficient: 0.820), with good test-retest reliability (Pearson's correlation coefficient: 00.850). The correlation of urinary symptoms of both questionnaires was statistically significant (r = 0.929, p = 0.00), as were the pain domain (r=0.880, p=0.00), daily life domain (r=0.625, p=0.00), and quality of life domain (r=0.768, p=0.00). Sexual performance (r =0.190) was the domain with no statistically significant correlation. The length of time with the indwelling ureteral stent and the severity of symptoms had a correlation of (r=0.00). The mean application time of the USDT and USSQ was 1.8min (SD=0.76) and 8.36min (SD=1.87), respectively.

Discussion

Different tools have been designed to evaluate ureteral stent-related symptoms. However, most of the questionnaires present a challenge for the clinician and the patient, especially in public institutions, because they are self-administered, which means the patient must answer them. That becomes a problem when the patient is unable to read or write or when the patient is older and has a comorbidity, such as visual impairment, affecting his or her ability to answer that type of questionnaire.

In addition, the application of questionnaires that evaluate ureteral stent discomfort, such as the USSQ and its validated spanish version, is often not compatible with public health systems, given that consultation times are limited by the high number of patients seen at public institutions. Another feature of those questionnaires is their extended length, which makes their application difficult during consultation. Therefore, we decided to design a simple, effective, and easy-to-use tool based on the USSQ to evaluate ureteral stent discomfort (Figure 1).

Figure 1. Ureteral Stent Discomfort Test

Ureteral Stent Discomfort Test							
Name:							
Date:				Age:		Sex:	
Date of stent insertion:							
Time with indwelling ureteral stent:							
Do you currently have an indwelling ureteral stent?				Yes		No	
	Ureteral Stent Discomfort Test	**Never**	**Very seldom**	**Seldom**	**Sometimes**	**More than half the time**	**Almost always**
		0	1	2	3	4	5
1	How often have you had to urinate less frequently than every two hours?						
2	How often have you had the sensation of not emptying your bladder?						
3	How often have you found it difficult to postpone urination?						
4	How often have you presented with urine leakage?						
5	How often have you had a burning sensation during urination?						
6	How often have you observed blood in your urine?						
		Absent	**Mild**	**Moderate**	**Severe**		
		0	1	2	3		
7	If you have had lower back pain (lumbalgia), how would you describe it?						
8	If you have had lower abdominal pain (suprapubic region), how would you describe it?						
		Never	**Seldom**	**Very seldom**	**Sometimes**	**More than half the time**	**Almost always**
		0	1	2	3	4	5
9	In general, has the ureteral stent made you unable to walk, do exercise, or perform daily activities?						
10	Since ureteral stent placement, how often have you experienced pain or discomfort during sexual intercourse?						
11	Since ureteral stent placement, how often have you had to take an analgesic or pain medication to lessen the discomfort from the ureteral stent?						
12	Since ureteral stent placement, how often have you had to see a physician or go to the emergency room due to the discomfort from the ureteral stent?						
13	Since ureteral stent placement, how often has the ureteral stent negatively affected your daily life?						
						Urinary symptoms	/30
						Pain	/6
						Daily life	/5
						Sexual life	/5
						Medical care/analgesics	/10
						QoL	/5
						TOTAL SCORE	/61

Conclusion

Our results suggest that the USDT is a tool that is as reliable as the USSQ, as well as being a simpler alternative for evaluating ureteral stent discomfort. The most correlated domains were urinary symptoms, pain, and quality of life, which are also the most commonly affected domains, according to the literature. Sexual performance (r =0.190) was the domain that had no statistically significant correlation, most likely because the majority of the patients with an indwelling ureteral stent were sexually abstinent. Our sample size was limited, therefore future studies are needed to confirm the reliability of the USDT.

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