



## EVALUATION OF URINARY SYMPTOMS IN PATIENTS WITH URETERAL STENTS

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### ABSTRACT

**Introduction:** Ureteral stents are associated with a variety of symptoms of which urinary symptoms constitute a major part. The aim of our study was to assess the prevalence, associated inconvenience, frequency of various urinary symptoms in relation to ureteral stenting and assess the probable impact of pain related to stents to the QoL of patients. **Materials and Methods:** A total of 96 adult patients consecutively participated and they were asked to complete the USSQ questionnaire. The questionnaire gathered information on early (2 weeks after insertion) and late (before stent removal) complications of stent insertion. The questionnaire responses were analyzed using cross tabulations and descriptive statistics. **Results:** A high proportion (> 60%) of patients with stents reported frequency, urgency, dysuria and hematuria, which interfered with daily activities as they were associated with the flank and supra pubic pain. The differences between the prevalence of several urinary symptoms associated with stents and their improvement from the early stage to the late stage marked significant ( $p < 0.05$ ). Stents had a variable degree of impact on all general health domains. **Discussion:** The results of our study indicated that storage LUTS, loin pain in the side of the stent while passing urine and supra pubic discomfort were predominant domains affected by stents. The results confirmed the assumption that urinary symptoms had an impact on social life and that pain added to limitations in physical activities. We propose that indwelling ureteral stents are related with a wide scope of urinary tract symptoms and pain largely influencing the general health of patients.

**KEYWORDS:** Ureteral Stents, Stent Symptoms, Stent Related Pain, Quality of Life.

### INTRODUCTION

Self-retaining ureteral stents are commonly used to alleviate or manage upper urinary tract obstructions caused by urolithiasis and other genitourinary pathologies.<sup>[1]</sup> While most indwelling stents aid patients with drainage, unfortunately over 80% of patients with indwelling stents experience stent related symptoms (SRS), such as storage symptoms and pain, which lower their quality of life (QoL).<sup>[2]</sup> The assessment of the urinary symptoms caused by stents is not easy using clinical measures, and has hence resulted in a poor understanding of these symptoms.<sup>[3]</sup>

Ureteral stents are associated with a variety of symptoms of which urinary symptoms constitute a major part.<sup>[4]</sup> Recent studies demonstrate that patients with ureteral stents frequently reported bothersome urinary symptoms (78%), stent-related pain (80%), sexual dysfunction (32%), and reduced work capacity (58%).<sup>[5]</sup> Despite the studies carried out with a variety of symptoms, questionnaires and timing, it is not clear which symptoms are prevalent in patients with ureteral stents and how bothersome they are.<sup>[6]</sup>

The International Prostate Symptom Score (IPSS) and ureteral stent symptom questionnaire (USSQ) are validated instruments used for the assessment of lower urinary tract symptoms and their impact on QOL.<sup>[7]</sup> The aim of our study was to assess the prevalence, associated inconvenience, frequency of various urinary symptoms in relation to ureteral stenting using a validated questionnaire.

### MATERIALS AND METHODS

The criteria for selection in the study were unilateral placement of a double pigtail stent because of ureteric calculi or other upper tract obstructions with derangement of renal functions or obstructed infected kidney. A total of 96 adult patients with unilateral indwelling ureteral stents, who consecutively participated the Urology clinic of Teaching Hospital, Peradeniya, Sri Lanka, since April 2018 till March 2020 were considered for this analysis. They were asked to complete the USSQ questionnaire 2 week after insertion and 1 day before the stent removal to assess symptoms. The USSQ has 6 sections to evaluate the impact of stents on health related quality of life in a comprehensive

manner. The questionnaire was modified to gather information on early (2 weeks after insertion) and late (before stent removal) complications of stent insertion.

The questionnaire responses were analyzed using cross tabulations and descriptive statistics. The prevalence of various symptoms is presented in the categories of (never, occasionally, sometimes, most of the time and all of the time). Simple sums were obtained to derive an index score for each section of the USSQ. In addition, Wilcoxon signed rank tests were used to test for differences between individual questions, combining the

occurrence score with its bother score where present, for both stent in situ and after removal.

## RESULTS

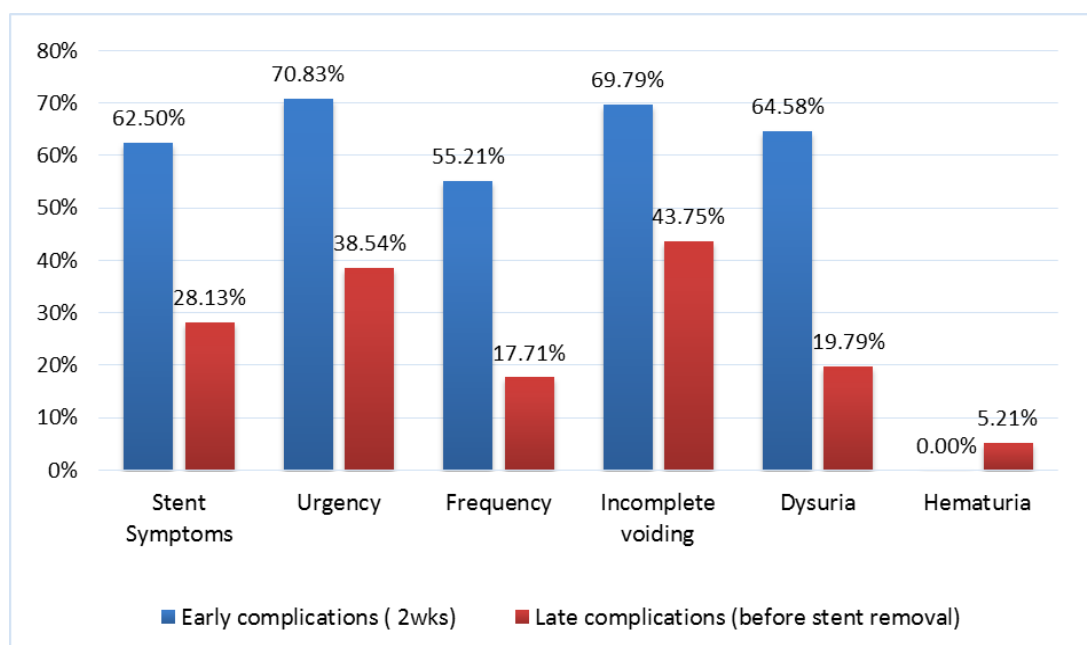
Of the 96 patients who were asked to participate in the study 59 men and 37 women with a mean age of  $49.90 \pm 2.63$  years completed the necessary questionnaires. The Median age was 50 with and age range of 19-70. The age, sex distribution and details of employment status, status of calculi and Hydronephrosis status of the stent group are presented in table 1.

**Table 1: Demographic distribution of the study group.**

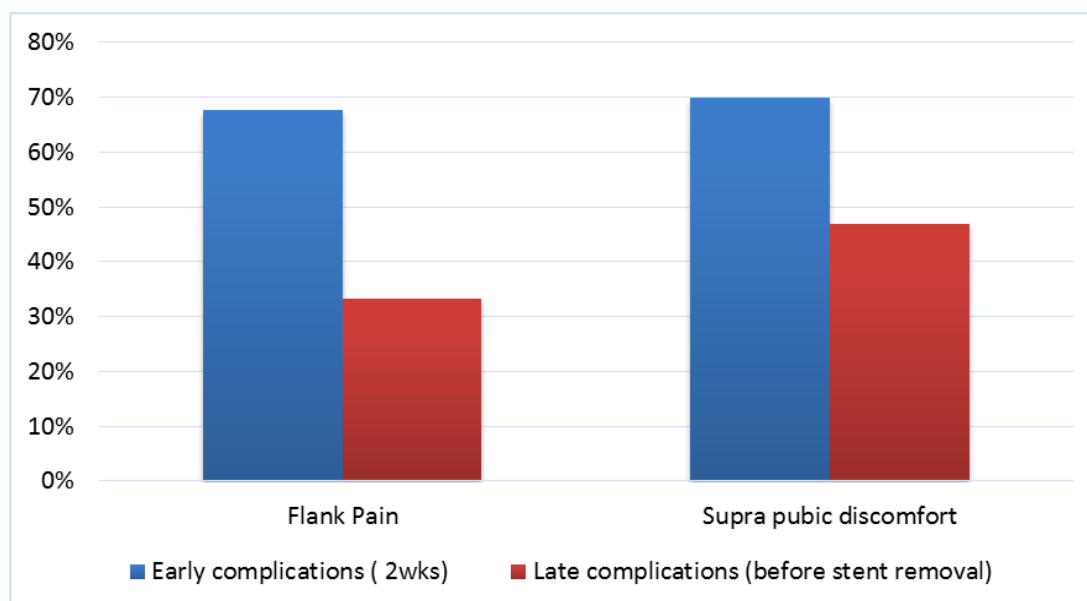
|                                        | Ureteric calculi  | Renal Calculi     | PUJ Obstruction  | Other             |
|----------------------------------------|-------------------|-------------------|------------------|-------------------|
| <b>Mean age <math>\pm</math> SD</b>    | 49.87 $\pm$ 13.18 | 53.64 $\pm$ 12.60 | 68.5 $\pm$ 10.60 | 50.23 $\pm$ 12.77 |
| <b>Male to female ratio</b>            | 39:28             | 7:3               | 2:0              | 11:7              |
| <b>Employment %</b>                    |                   |                   |                  |                   |
| <i>Full time</i>                       | 39                | 0.30              | 0                | 33.3              |
| <i>Part time</i>                       | 8.96              | 0.20              | 0                | 16.67             |
| <i>Retired</i>                         | 4.48              | 0.00              | 0                | 5.56              |
| <i>Student</i>                         | 1.49              | 0.10              | 0                | 11.11             |
| <i>Unemployed</i>                      | 46.27             | 0.40              | 100              | 27.78             |
| <b>Negative Work and performance %</b> |                   |                   |                  |                   |
| <i>physical</i>                        | 56.72             | 70.00             | 0.00             | 50.00             |
| <i>continued work</i>                  | 25.37             | 50.00             | 0.00             | 38.89             |
| <i>Social activity</i>                 | 79.10             | 90.00             | 100.00           | 100.00            |
| <i>Sexual</i>                          | 68.66             | 50.00             | 100.00           | 77.78             |
| <i>Travel</i>                          | 55.22             | 70.00             | 0.00             | 50.00             |
| <b>Stone passed %</b>                  | 89.55             | 90                | NR               | 77.78             |
| <b>Hydronephrosis %</b>                | 37                | 10                | 2                | 18                |
| <i>Mild</i>                            | 72.97             | 0.40              | 100              | 44.44             |
| <i>Mild to moderate</i>                | 5.41              | 0.00              | 0                | 0.00              |
| <i>Moderate</i>                        | 16.22             | 0.20              | 0                | 16.67             |
| <i>Moderate to severe</i>              | 0.00              | 0.00              | 0                | 5.56              |
| <i>Severe</i>                          | 5.41              | 0.10              | 0                | 5.56              |
| <i>None</i>                            | 86.49             | 0.30              | 0                | 27.78             |

NR- Not relevant

Chart 1 shows the percentage of patients reporting various urinary symptoms. Of the patients with the stent for 2 weeks 62.5% voided every 2 hours or less during the day and 70.83% had the urge to void frequently. A high proportion of patients with stents reported frequency, urgency, dysuria and hematuria, which interfered with daily activities as they were associated with the flank and supra pubic pain. The differences between the prevalence of urinary symptoms associated with stents and their improvement from the early stage to the late stage marked significance ( $p < 0.05$ ) in symptoms like Urgency, Incomplete voiding and Hematuria, while at late stage flank pain also showed a significant improvement (Table 2).



**Chart 1 Early and Late complications of Stenting symptom.**



**Chart 2 Reported pain in the loin and supra pubic discomfort.**

**Table: 2: Characteristics improvement of urinary symptoms with the stent and stent related pain.**

|                        | Asymptomatic significance of improvement (p<0.05) |
|------------------------|---------------------------------------------------|
| <b>Symptoms %</b>      |                                                   |
| Urgency                | 0.000                                             |
| Frequency              | 0.058                                             |
| Incomplete voiding     | 0.000                                             |
| Dysuria                | 0.092                                             |
| Hematuria              | 0.000                                             |
| stent crusting         |                                                   |
| <b>Pain symptoms %</b> |                                                   |
| Flank Pain             | 0.006                                             |
| Supra pubic discomfort | 0.916                                             |

More than 60% of patients reported stent related pain (Chart 2). Pain occurred in the loin/flank region in majority but the Supra pubic discomfort was most common among the patients and that it had a little or no improvement over the period is also noteworthy.

Stents had a variable degree of impact on all general health domains. A high percentage of patients reported tiredness and an inability to feel calm and peaceful with the stent. Similarly, stents affected physical activities and resulted in reduced enjoyment of social life and the need for extra help performing daily activities. The stents had a more negative impact on health related quality of life in ureteric calculi and renal stone groups. Results revealed problems due to stents in 68.66% of patients who were sexually active, which were commonly experienced in the form of physical pain. However, stents also affected other sexual health domains such as social and physical activity. With the stent in place only 22.91% had the ability to continue work. Travelling was limited 45.83% of the patients due to the urgency and need of frequent voiding.

## DISCUSSION

The results of our study indicated that storage LUTS, loin pain in the side of the stent while passing urine and supra pubic discomfort were predominant domains affected by stents, which in turn had a marked impact on general health. Stents also resulted in significant reduction in the work satisfaction and performance, which improved with time before stent removal. The main reason for this improvement lies behind patient getting adapted to the stent.

A study conducted by Damiano et al in 2002 has evaluated early and late complications of ureteral stents, including hematuria (18%) and flank pain (25%).<sup>[8]</sup> Furthermore symptoms including frequency (50–60%), urgency (57–60%), dysuria (40%), incomplete emptying (76%) and incontinence (25%) were reported in a study carried out India.<sup>[9]</sup> The findings of both studies showed an approximate similarity with the prevalence early and late complications in our study with slightly higher percentages noted in frequency and urgency. This observation could be due to the continuous intake of water as advised by the clinicians in order to reduce formation of concentrated urine and crystal formation and to facilitate the passage of the stone. Similarly, Frequency and urgency are thought to result from mechanical stimulation of the bladder mucosa by the distal coil. Supporting this theory, patients do not seem to experience frequency to the same degree at night as they do during the day likely because there is less stent movement at rest.<sup>[2,9]</sup>

Moreover, Chew et al and Halebian et al have reported a flank pain in 19–32% and supra pubic pain in 30% of the patients participated in their studies.<sup>[10,11]</sup> Ramsay (1985) and Mosli (1991) have postulated reflux of urine through the stent during voiding as a cause of the stent-related

flank pain and renal colic. Added to that, detrusor contraction would transmit increased intravesical pressures to the renal collecting system as well and ultimately resulting flank pain.<sup>[12,13]</sup> To minimize this impact on patients, they are constantly advised to drink a lot of water and also to facilitate urine passing,  $\alpha$ -blockers like Tamsulosin and Prazosin are administered which might have resulted in the eventual improvement of the flank pain in the study group.

The impact on sexual health was high among females (54.83%) than in males (45.16%). Although affected by stents, sexual activity will not be a major problem with short stent indwelling time (week 1) but it can become important as the stent indwelling time increased. The wide ranging impact that stenting has on general health mostly effects on physical health, normal activities, social life and vitality. The results confirmed the assumption that urinary symptoms had an impact on social life and that pain added to limitations in physical activities.

## CONCLUSION

We propose that indwelling ureteral stents are related with a wide scope of urinary tract symptoms and pain largely influencing the general health of patients. A high proportion of patients with stents reported frequency, urgency, dysuria and hematuria, which interfered with daily activities as they were associated with the flank and supra pubic pain. The outcomes affirmed the presumption that urinary symptoms have affected social life and that pain added to constraints in physical activities.

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