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FREQUENCY OF POSTOPERATIVE BACTERIURIA AND URINARY TRACT INFECTION IN PATIENT WITH DOUBLE J STENT

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Abstract

Introduction and Objectives: *Urinary tract infections and bacteriuria is considered as one of the major complications in patients undergoing surgical implants like catheters and stents such as Double J stents. This study was aimed to check the frequency of urinary tract infection among receptive patients of Double J stents in a hospital setting of Lahore.*

Material and Methodology: *This cross-sectional study was conducted at Ihsan Mumtaz Hospital during August 2024-January 2025 on 96 patients indwelling Double J stent. A questionnaire was used for data collection which included questions related to basic patient demographics, reason for stenting, stenting based symptoms and risk factors contributing towards infection. Laboratory findings like urine culture were accessed to check the incidence of infection. Data obtained was entered categorically and analyzed using SPSS26.*

Results: *Among 96 patients, 61(63.5%) were male while 35(36.5%) were female, while 26(27.08%) among them had diabetes. Majority of patients who got Double J stents presented with kidney stones 86(89.5%) followed by urethral stricture 10(10.4%). Among various clinical conditions following stenting, frequent urination 77(80%) was most commonly observed followed by fever 73(76%), discomfort 24(25%) and burning sensation 10(10.8%) during urination. Among these patients 65(67.7%) presented with bacteriuria and positive microbial growth on culture in comparison to pre-stenting samples with a significant value of 0.002 [p<0.005] indicating a strong correlation between the Double J stent and urinary tract infection.*

Conclusion: *Double J stent can be potential source of urinary tract infection, removing it timely can be effective in preventing the infection.*

INTRODUCTION

Urinary tract infections and bacteriuria following insertion of medical devices like stents in the urinary tract has become one of the major concerns in the urology prolonging the patient stay in hospital and costs expensive treatments [1,2] . With the advancement in the endo-urology fields many types of stents have been developed because of their significant role in the ease of patient suffering with urinary tract blockage [3] . Double J stent is one of these devices which is J shaped and used for the

urine drainage from kidney to bladder in patients suffering with obstructive conditions like kidney stones, urethral stricture, or tumors [4–6] . The Double J stent implantation in patients not only open the blockage, it also plays a significant role in the pain reduction by releasing the urine pressure in kidney, promote healing by opening the ureter following post-surgery and allows the passage of small stones [7–9] . However, despite of its many benefits for the patients suffering with acute to chronic blockage. Many complications have been reported in patients indwelling with Double J stent which range from minor clinical conditions like discomfort, pain during urination and frequent urination to some life-threatening urinary tract infections requiring longer medical attention and antibiotic treatments [10–12]. Many studies have been done in this regard to check the prevalence of urinary tract infection in Double J stent indwelling patients and observe their relationship in receptive patients in an effort to trace its etiology to mitigate this issue [13,14] . This study was also aimed to check the prevalence of urinary tract infection in patients with Double J stent and its association with the Double J stent in a hospital setting of Lahore.

Material and Methodology:

This cross-sectional study was conducted in Ihsan Mumtaz Hospital Lahore over a period of six months. All the patients admitted for Double J stent implantation during August 2024-January 2025 were included in this study. Data from these patients was collected using a well-designed questionnaire containing research objectives-oriented questions. It included data from patient basic demographic like age, gender, indication of Double J stenting like kidney stones, urethral stricture, or malignancy for which patient got the stent implant, any post-implant symptoms developed like frequent urination, discomfort or burning sensation during urination, urine obstruction and fever and risk factors for development of any complication post stenting like diabetes mellitus. Laboratory test findings like urine culture reports were also accessed for any positive microbial growth as one of the main objectives of this research to check for any infection. Data obtained was statistical analyzed using SPSS 26.

Results:

A total of 96 patient who underwent Double J stenting were included in this study among which 61 (63.5%) were male and 35(36.5%) were female as shown in Figure 1.

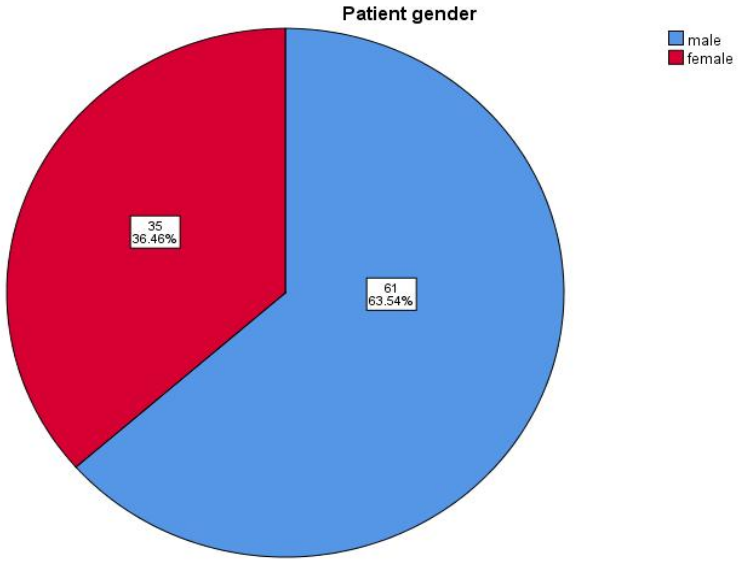

Figure 1 Gender wise Distribution of Patient Requiring Stent.

Majority of patient who admitted at hospital for Double J stent implant surgery presented with kidney stones 86 (89.5%) followed by urethral stricture 10(10.4%) as shown in Figure 2.

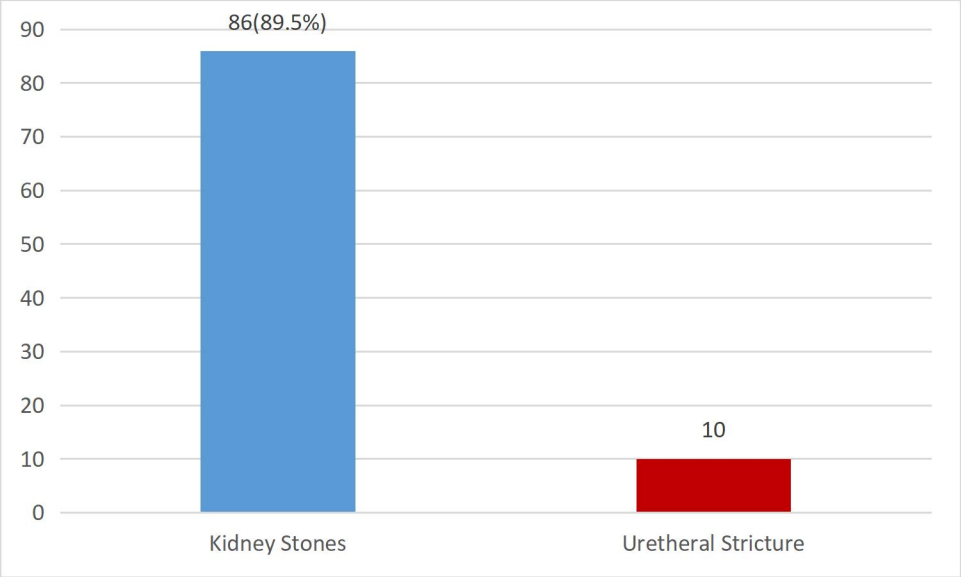

Figure 2 Reasons for DJ Stent Placement in Patients

At the time of admission, while taking medical history it was also observed that 26(27.08%) out of these 96 patients had diabetes mellitus while 70(72.9%) had normal blood sugar levels with no history of diabetes as shown in Figure 3.

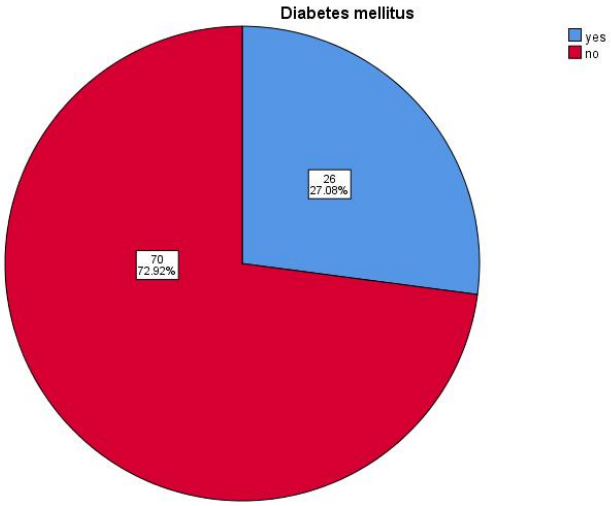

Figure 3 Diabetes Status of Double J Stent Indwelling Patients

Following the placement of Stent, patient was observed as a part of post-surgery follow up to check for any change in the patient clinical condition. It was observed that 77(80%) of the patient complained about frequent urination while 73(76%) patients presented with fever on regular check-up. 24(25%) out of 96 patients felt discomfort and 10(10.8%) experienced burning sensation while urinating. Microbiological reports of pre-stenting and post stenting urine samples were observed for bacteriuria or any urinary tract infection. It was noted that before stenting patient culture report was negative. However, post stenting microbiological analysis revealed significant microbial growth in urine sample of 65(67.7%) patients. Correlation analysis performed provided a significant value of 0.002 ($p<0.005$) between Double J stenting and urinary tract infection suggesting a prominent role of Double J stenting in development of urinary tract Infection.

Discussion:

Urinary tract infections and bacteriuria in patients indwelling Double J stent are major concern among the endo-urologist because of its role in increasing the misery of already suffering patients. Double J

stent is widely used around the globe for the patients suffering with urinary blockage as observed in our study where 96 patient requiring Double J stent had kidney stones and urethral stricture which were mostly prevalent in male than female. This dominant prevalence of male over female in case of upper tract urinary blockage requiring stent placement has been also observed in a study conducted at a teaching hospital[15].

Many studies have reported its significant role in the urinary drainage in patients suffering with kidney stones as a study conducted by clinical research department of endourology reported its placement potential benefits in post-ureteroscopy patients [16]. While another systemic review also reported its prominent role in stone removal before lithotripsy in comparison to those who were not endorsed with stent before procedure [17]. Among all the patients who underwent procedure for Double J stent placement many patients reported of post-stenting side effects which include frequent urination, fever, discomfort and burning sensation during urination. Which can be commonly observed in these patients however intensity may be variable due to health condition [18].

While analyzing the pre- and post-stenting urine culture reports it was observed that 65 out of 96 got positive urine culture suggesting its association with Double J stenting. Furthermore, it was observed that all the diabetic patients had growth in their microbial culture indicating the role of diabetes in the development of infection by weakening the immune system[19]. Many studies have observed the incidence of urinary tract infection in stent indwelling patients as a study conducted in India reported the bacterial growth in urine culture sample post stenting [20] . Another study suggested a significant correlation between the long duration stenting and positive urine culture which might be a contributing factor in our case too suggesting the timely removal of stent to avoid bacterial colonization[21].

Conclusion

It was concluded from the above study that Double J stenting can play a significant role in the development of urinary tract infection. Routine monitoring and timely removal can prevent the bacterial colonization causing this infection.

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Author Contribution:

I. N: (Investigation) acquisition of data, (Writing – Original Draft) Drafting the manuscript, (Formal analysis) analysis and/or interpretation of data

H. J: (Conceptualization) Conception and design of study, (Formal analysis) analysis and/or interpretation of data

W. F (Writing - Review & Editing) revising the manuscript critically for important intellectual content.

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