Research Article

# A COMPREHENSIVE ANALYSIS OF UROLOGICAL SURGICAL PROCEDURES AT DOW UNIVERSITY HOSPITAL IN KARACHI- A RETROSPECTIVE STUDY

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## ABSTRACT

The objective of this study was to investigate the indications and the variety of urological surgical procedures conducted at DOW University Hospital in Karachi, Pakistan over a two-year period. This retrospective observational study was conducted from April 2021 to April 2023 including 1773 patients, recruited by using non-probability consecutive sampling technique. Information was obtained from the clinical notes of patients, records of emergency department, and the main electronic database of the hospital. A total of 1773 patients fulfilling the inclusion criteria were included in the present study, with a mean age of 38.73±16.09 years. The majority of the participants were males. The most frequently detected diagnosis in this study was Renal Calculi (28.3%), followed by BPH (11%), and ureteral stones (8%). Among the day-case surgeries, DJ removal was the most common procedure (19%). The most often encountered diagnoses and indications for surgery were renal and ureteral calculi and benign prostatic hyperplasia (BPH). Implementing a dedicated day surgery center and hiring additional specialized healthcare personnel, would improve the caliber and volume of urological services offered at Dow University Hospital.

**Key words: Urology, cystoscopy, emergency, stenting**

## INTRODUCTION

The emergence of endo-urology and its subsequent use two centuries ago has brought about numerous technological advancements and global acceptability. Enormous and poorly designed machinery has been replaced by small, high-quality tools that are specifically designed to carry out complex treatments with fewer incisions and a faster patient recovery time (1). Minimal access procedures have become universally accepted and preferred method of urological practice worldwide. These techniques have had a significant rise in popularity and adoption in Pakistan during the past years. Several endo-urological treatments can be conducted with minimum anesthesia and as outpatient operations. Although there has been progress in the field of endo-urology practice in Pakistan in the past ten years, the available facilities are still insufficient to meet the demands of the enormous number of Pakistani patients seeking these services. Emergency services are crucial components of every hospital, playing a vital role in its operations. Emergency circumstances are prevalent, and they affect all specialties universally. While not uncommon in the field of Urology, they are relatively less prevalent compared to certain other surgical specialties (2). Fortunately, the majority of these conditions are not life-threatening. However, it is crucial to respond promptly and efficiently in order to prevent long-term difficulties and achieve good results. The majority of cases necessitate surgical intervention as the most effective means of treatment. The initial point of contact is either the primary care physician or the emergency physician. Certain disorders, such as severe urine retention, are particularly noticeable, while others can provide difficulties in diagnosis. It is crucial to maintain a high level of suspicion and promptly refer the patient to a Urologist to avert potentially severe complications. Thorough examination of patients and the use of suitable equipment enable prompt identification of medical conditions, leading to favorable results. Common urological crises encountered in emergency departments encompass priapism, acute renal colic, acute urine retention, massive macroscopic hematuria, acute scrotal disorders, urinary tract infection, genitourinary trauma, and paraphimosis (3). In a retrospective assessment conducted by Fall et al. over a period of 20 months, it was discovered that urine retention was the most frequent urological emergency reported in 53% of patients hospitalized in Aristide-Le-Dantec University Teaching Hospital in Dakar (4). The most commonly performed technique in these cases was the insertion of a suprapubic catheter. In prospective research

conducted by Talreja et al. at SMS Hospital Jaipur, renal colic was identified as the most prevalent urological emergency, accounting for 24.2% of cases (5). Urologic injuries caused by trauma are frequently observed in connection with car accidents, and urinary tract involvement is responsible for less than 1% of the multiple injuries (6). The urology department of Dow University Hospital was established in 2018 with two consultant Urologists. Before then only the transplant Urology team existed with their own department and focused primarily on transplant patients. The Urology department now has grown to include minor and major spectrum of Urological procedures to provide the best care possible to patients and make affordable options available to patients. A surgical audit to determine the number of procedures from April 2021 to April 2023 aims to bring forward procedures being commonly performed, determine the flow of patients, and improve department working conditions by establishing teams in areas of high patient flow. The objective of this study was to investigate the indications and the variety of urological surgical procedures conducted at DOW University Hospital, Karachi over a two-year period. The study aimed to identify the most common procedures, and their indications, and share our institutional experience in performing these procedures, providing recommendations for future improvements.

## METHOD

After the ethical approval from the institutional review board, this retrospective observational study was conducted at DOW University Hospital, Karachi Pakistan. Through non-probability consecutive sampling, 1773 patients, between the age range of 11-95 years including both genders, who underwent urological surgical procedures at Dow University Hospital between April 2021 and April 2023 were included. Patients admitted under the renal transplant services were excluded from the analysis due to the specialized nature of their procedures and distinct clinical considerations. Information was obtained from the clinical notes of the patients, records of the emergency department admissions, and the main electronic database of the hospital. The acquired information included the demographic features of the patients, the preoperative diagnoses or indications for the surgeries (whether they were emergency or elective), and the urological procedures performed (both open and endo-urology). The data analysis was conducted using the Statistical Package for the Social Sciences (SPSS), version 20.0.

## RESULT

A total of 1773 patients fulfilling the inclusion criteria were included in the present study, with a mean age of 38.73±16.09 years. The majority of the participants were males in the present study, accounting for (73%) (Table 1). Among females, the majority of the participants were in the age range of 30-39 years (23%), while in the case of males, majority of the participants were in the age range of 20-29 years (22%). The most frequently detected diagnosis in this study was Renal Calculi (28.3%), followed by BPH (11%), and ureteral stones (8%) (Figure 1). Among the day-case surgeries, DJ removal was the most common procedure (19%) (Figure 2). Table 2 shows the total number and types of urological procedures performed at Dow University Hospital Karachi. Table 3 shows the endo-urological procedure frequency distribution in the 2-year study period with the most common procedure is TURP of BPH (27%).

**Table1. Age distribution of the study participants (females versus males)**

| Age range | Female | Male | Total |
|---|---|---|---|
| 10-19 | 52 (11%) | 160 (12%) | 212 (12%) |
| 20-29 | 106 (22%) | 283 (22%) | 389 (22%) |
| 30-39 | 110 (23%) | 280 (21%) | 390 (22%) |
| 40-49 | 97 (21%) | 254 (20%) | 351 (20%) |
| 50-59 | 52 (11%) | 161(12%) | 213 (12%) |
| 60-69 | 21 (4%) | 61 (5%) | 82 (5%) |
| 70-79 | 27 (6%) | 73 (6%) | 100 (6%) |
| 80-89 | 5 (11%) | 20 (2%) | 25 (2%) |
| 90-99 | 2 (11%) | 9 (0.6%) | 11 (0.6%) |
| **Total** | 472 (27%) | 1301 (73%) | 1773 |

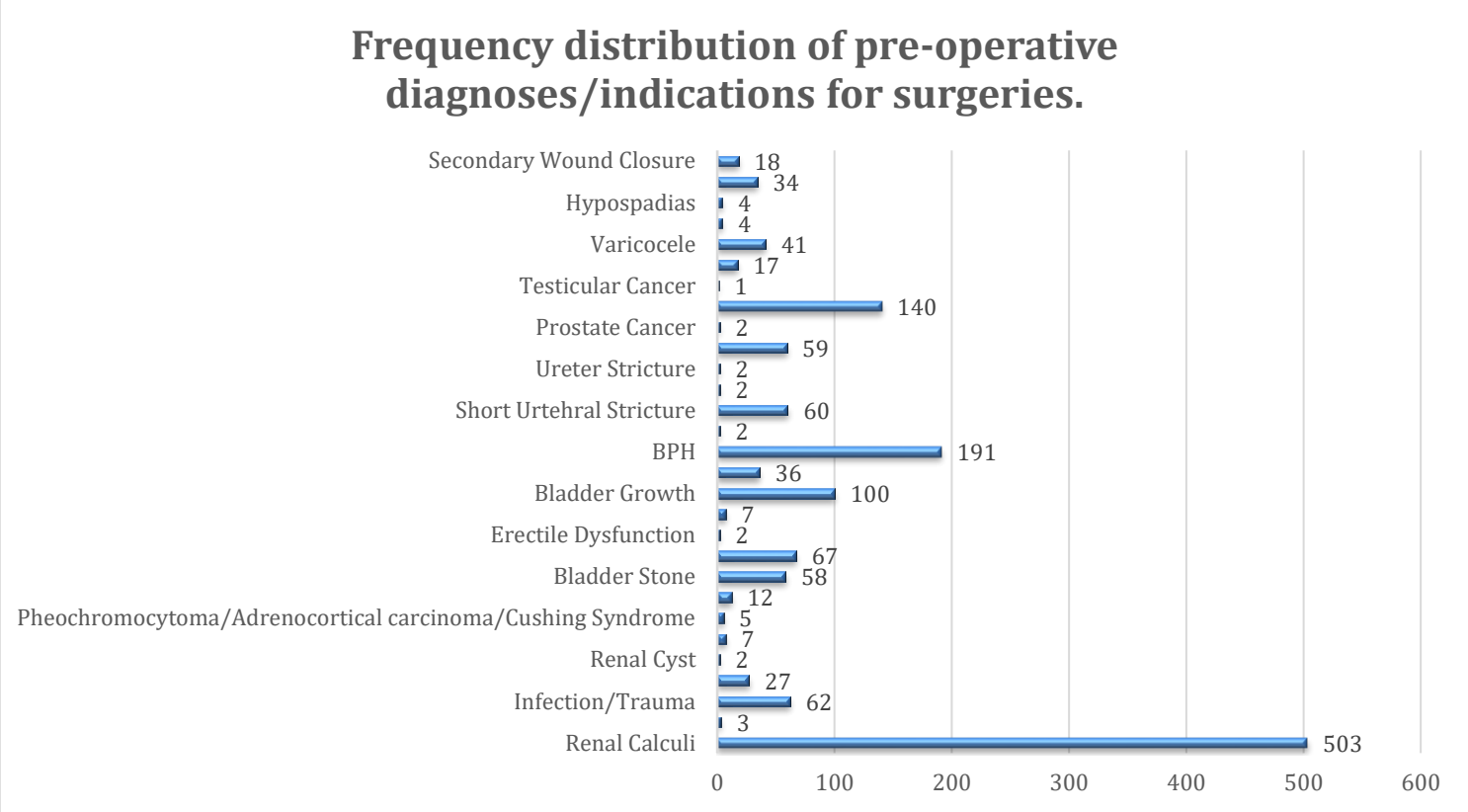


**Figure 1. Pattern of pre-operative diagnosis/ indicators for surgeries**

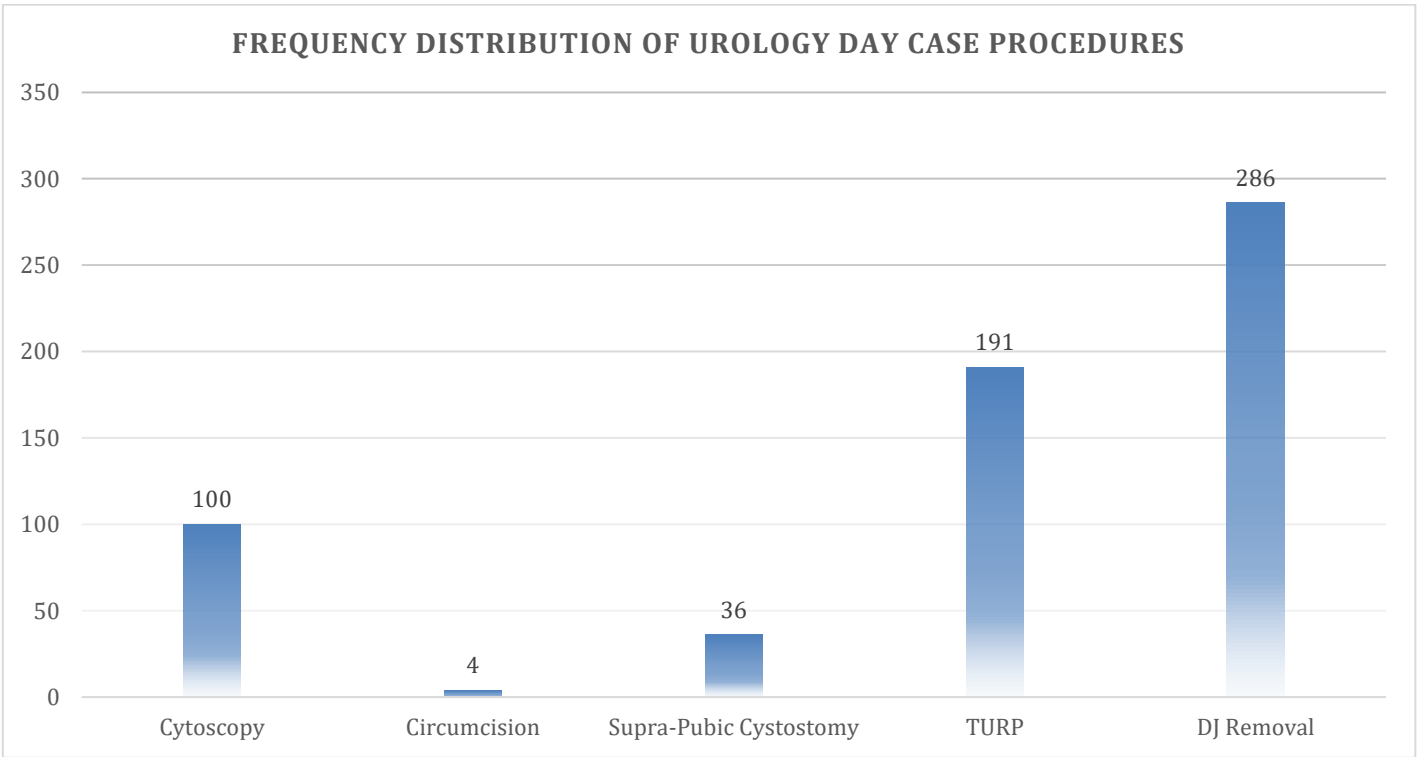


**Figure 2. Frequency distribution of urology day case procedures**

*Table 2: Frequency of all urological procedures*

| PROCEDURE | Frequency (%) (n=1773) |
|---|---|
| PCNL (Percutaneous Nephrolithotomy) | 144 (8%) |
| Pyelolithotomy | 3 (0.1%) |
| Simple Nephrectomy & Partial Nephrectomy | 63 (3%) |
| Radical nephrectomy | 28 (1%) |
| Cyst Ablation | 2 (0.1%) |
| Pyeloplasty | 7 (0.3%) |
| Adrenalectomy | 5 (0.2%) |
| DJ Stenting (placement) | 12 (0.6%) |
| Ureterorenoscopy (URS) with lithotripsy (+/- DJ stent placement) | 365 (21%) |
| Cystolithotomy | 4 (0.2%) |
| Cystolitholapaxy | 54 (3%) |
| Trans urethral resection of bladder tumor (TURBT) | 67 (4%) |
| Cystoscopy for bladder tumors | 100 (7%) |
| cystoscopy for DJ removal | 286 (16%) |
| Epididymal cyst excision | 7 (0.3%) |
| Penile Implant | 2 (0.1%) |
| SPC (supra pubic catheterization) | 36 (2%) |
| Transurethral Resection of Prostate (TURP) | 191 (11%) |
| Channel TURP | 2 (0.1%) |
| Direct vision internal urethrotomy (DVIU), OIU, IU | 60 (3%) |
| Urethroplasty | 3 (0.1%) |
| Ureteroplasty | 2 (0.1%) |
| Extracorporeal shock wave lithotripsy (ESWL) (or Lithotripsy) | 140 (8%) |
| Orchidectomy | 44 (2%) |
| Radical Orchidectomy | 1 (0.05%) |
| Subcapsular Orchidectomy | 2 (0.1%) |
| Orchidopexy | 15 (0.8%) |
| Hydrocelectomy | 17 (0.9%) |
| Circumcision | 4 (0.2%) |
| Varicocelectomy | 41 (2%) |
| Meatoplasty, Meatotomy | 4 (0.2%) |
| Debridement | 34 (2%) |
| Miscellaneous | 28 (1%) |

**Table 3: Frequency of endo-urological procedures**

| Endo-urological procedures | Frequency (%) (n=719) |
|---|---|
| **Ureterorenoscopy with pneumatic lithotripsy** | 140 (19.4%) |
| **TURP for BPH** | 191 (27%) |
| **Channel TURP in prostate cancers** | 2 (0.2%) |
| **Cystoscopy for bladder tumors** | 100 (14%) |
| **Cystoscopy for Double J Stents removal** | 286 (40%) |

## DISCUSSION

In the present study, the mean age observed was 38.73±16.09 years with a median range between 30-39 years, which was different from the median age range of 0-9 years observed by Eke et al (7). This difference can be attributed to the fact that Eke et al primarily focused on pediatric patients (39.1% of their cases), whereas our study had a much smaller proportion of pediatric patients (12%). The most frequently detected diagnosis in this study was Renal Calculi (28.3%), followed by BPH (11%), which aligns with previous studies conducted in Nigeria and the most recent one in Ethiopia. It also aligns with a study conducted in India that reported renal colic as the most prevalent emergency. However, it differs from the study conducted in Malawi, where urethral strictures were more prevalent (5, 8-10). Prostatectomies, which include both open prostatectomy and TURP, were the most frequently performed elective procedures for BPH, accounting for 191 (11%) cases of the total. This finding aligns with the most common diagnosis in our study and a previous study in Zaria. However, it differs from the report in Port Harcourt, where circumcisions were the dominant procedure in a study primarily involving children under 9 years of age (734 cases or 39.1%). The prevalence of urine retention as the most frequent emergency was found to be consistent with other studies conducted in Nigeria and Senegal (11-13). Out of all the procedures conducted in our study, 1517 of them, accounting for 85% of the total, were carried out as day cases, as illustrated in Figure 2. The majority of endo-urological operations performed were cystoscopy and stent removal. This occurrence is expected, as DJ stents are regularly retained after stone extraction to prevent strictures and must be extracted during cystoscopy after symptoms subside and urine is passed freely by patient. Cystoscopy and DJ stenting are used as an interim treatment for individuals who have declining kidney function due to obstructive nephropathy caused by kidney stones. All diagnostic and therapeutic cystoscopies were performed mainly as outpatient procedures (14). The cystoscopies conducted for the removal of DJ stents and for diagnostic purposes were performed under regional anesthesia. Regional anesthesia is the most commonly employed type of anesthesia in this series. This is because a larger number of endourological cases had cystoscopies for stent removal in post stone extraction of patients. The retrospective nature of the data collection is considered as a limitation. However larger scale study with evaluation of clinical outcome of the patients' needs to be conducted.

## CONCLUSION

The most often observed diagnoses and reasons for surgery were renal calculi, BPH, and ureteral stones. The establishment of a specialized day surgery unit and the recruitment of permanent and additional healthcare workers specializing in urology, would enhance both the quality and quantity of urological treatments provided at Dow University Hospital.

**Conflict of Interest:**

Authors declared no conflict of interest.

## Ethical Approval:

The study was approved by the Institutional review board/Ethical review board

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