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CASE REPORT

Place of Minimally Invasive Surgery in the Urology Department of the University Hospital Pr Bocar Sidy Sall in Kati

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Abstract

Introduction: Minimally invasive surgery represents all endoscopic, laparoscopic, or laparoscopic techniques, and robot-assisted surgery. The objective is to assess the role of minimally invasive surgery in the department's surgical activities. Materials and Methods: Cross-sectional, descriptive, and retrospective study spanning from January 1, 2021, to December 31, 2023, i.e., a period of three years. Our study included all patients who underwent endoscopic and laparoscopic surgery. Results: Minimally invasive surgery was performed in 346 patients, representing 67.57% of our surgical activities. Males were the most prevalent, representing 81.50%, with a sex ratio of 4.40. The age group of 61-80 years was the most represented, representing 48.55%. The majority of our patients presented with lower urinary tract symptoms, representing 50.82%, followed by hematuria, representing 18.78%. The urine culture was positive in 110 patients (32.2%). The isolated organism was Escherichia coli in 45.4%. Cystoscopy was performed in 41 patients (12%). TURP was the most commonly performed endoscopic procedure (44.67%). We performed 8 cases of laparoscopic surgery. The outcome was favorable in 97.66% of cases at 72 hours postoperatively. The main complication was renal failure (2.16%), the cause of which was anemia. Ionic disturbances such as hyperkalemia accounted for 10%. These ionic disturbances were normalized 48 hours after the procedure. Conclusion: Minimally invasive surgery is progressing in our urology department. It has revolutionized the management of urological pathologies. This technique must be encouraged to improve the quality of care as well as the comfort of urologists.

Keywords: Surgery, minimally invasive, endoscopy, laparoscopy.

1. Introduction

Minimally invasive surgery represents all endoscopic and laparoscopic techniques. Born in the late 1990s, robot-assisted laparoscopic surgery is experiencing exponential growth [1]. Minimally invasive surgery can be divided into: endoscopic surgery; laparoscopic surgery; robot-assisted laparoscopic surgery. Urological endoscopic surgery is a surgical technique that uses cameras to operate inside the urinary tract through natural orifices. These are mainly interventions on the prostate, urethra, bladder, ureter, and kidney. In recent years, the minimally invasive approach has become widespread in urology, driven by the multiple advantages it offers over open surgery in terms of reducing morbidity and mortality in general, including shorter operating times, the possibility of outpatient care, and a faster return to activities [2, 3, 4]. Standard laparoscopy (laparosurgery) or robot-assisted laparoscopy allows for an intervention to be performed without opening, but by making small

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holes of a few centimeters. Minimally invasive surgery has been widely used for several decades in developed countries [2]. It began to develop in sub-Saharan Africa at the beginning of the 21st century [2]. We started this minimally invasive surgery in the department in the 2018s with the acquisition of the first endoscopy equipment. The objective is to evaluate the place of minimally invasive surgery in the surgical activities of the department.

2. Materials and Methods

Study Site: The study was conducted in the Urology Department of the Pr Bocar Sidy Sall University Hospital in Kati.

2.1 Study Type and Period

We conducted a cross-sectional, descriptive study with retrospective and prospective data collection over a 3-year period from January 1, 2021, to December 31, 2023.

2.2 Study Population

Our study included all patients who had undergone endoscopic and laparoscopic surgery.

2.3 Inclusion Criteria

All patients, regardless of pathology, who underwent endoscopic and laparoscopic surgery. Data Collection: Data were collected from the inpatient registry, inpatient records, and surgical report registers.

2.4 Parameters Studied Were

Parameters Studied Were type of pathology, type of minimally invasive surgery, length of hospital stay, duration of urinary drainage, and postoperative outcome. Once discharged, patients were seen by appointment in an outpatient clinic within one week at the latest.

2.5 Data Analysis

Data analysis was performed using Word 2016, Excel 2016, and SPSS version 23.0 after data verification.

2.6 Ethical Considerations

Patient anonymity was guaranteed with their consent for the use of personal data.

3. Results

Minimally invasive surgery was performed in 346 patients, or 67.57% of our surgical activities (Table 1). The male sex was the most dominant, or 81.50%; with a sex ratio of 4.40. The age group of 61-80 years was the most represented, or 48.55% (Table 2). The majority of our patients presented lower urinary tract symptoms, or 50.82%, followed by hematuria 18.78% (Table 3). The urine culture was positive in 110 patients, or 32.2%. The isolated germ was dominated by Escherichia coli in 45.4% (Table 4). TURP was the most performed endoscopic procedure, or 44.67 (Table 5). The outcome was favorable in 97.66% of cases at 72 hours post-operatively. We performed 8 cases of laparoscopic surgery (Table 6). Figures 1 and 2 show endoscopic views of laser ureteroscopy and an impacted stone in a ureteral meatus. The main complication was renal failure (2.16%), the cause of which was anemia. Ionic disorders of the order of hyperkalemia represented 10%. These ionic disorders were normalized 48 hours after the intervention.

Table 1. *Distribution by type of surgery*

Type of surgery	Number	Percentage (%)
Minimally invasive	346	67.57
Open surgery	166	32.43
Total	512	100

Minimally invasive surgery was performed on 346 patients, representing 67.57% of our surgical activities.

Table 2. *Distribution by age group*

Age group	Number	Percentage (%)
Under 20	10	2.89
[20 - 40]	54	15.60
[41 - 60]	88	25.43
[61 - 80]	168	48.55
Over 80	26	7.51
Total	346	100

The 61-80 age group was the most represented.

Table 3. *Distribution by Functional Signs*

Functional Signs	Number	Percentage (%)
LUTS	207	50.82
Hematuria	65	18.78
Low Back Pain	38	10.9
Acute urinary retention	33	9.53
Pelvic Pain	01	0.28
Urine Leakage	01	0.28
Anuria	01	0.28
Total	346	100

The majority of our patients presented with LUTS, i.e., 50.82%.

Table 4. *Distribution of patients according to the organism identified in the urine culture*

Urine culture	Number	Percentage (%)
Escherichia Coli	50	45.4
Klebsiella pneumonie	14	12.8
Enterococcus faecalis	11	10.0
Citrobacter freundii	08	7.2
Staphylococcus aureus	08	7.2
Enterobacter cloacae	07	6.3
Candida albican	05	4.5
Staphylococus spp	03	2,8
Pseudomonas aeruginosa	03	1,9
Citrobacter koseri	01	0.9
Staphylococcus haemolyticus	01	0.9
Total	110	100

The urine culture was positive in 110 patients and Escherichia Coli accounted for 45.4%.

Table 5. *Distribution by Endoscopic Technique*

Endoscopic Technique	Number	Percentage (%)
TURP	151	44.67
TURB	96	28.40
Endoscopic Internal Urethrotomy (EIU)	26	7.69
Double-J catheter insertion	16	4.73
Flexible laser ureteroscopy	10	2.95
Endoscopic Internal Urethrotomy + TURP	08	2.36
TURP + TURB	07	2.07
Semi rigid laser ureteroscopy	07	2.07
Prostate vaporisation	06	1.77
Cervical TURP	03	0.88
EIU + Cervicoprostatic incision	03	0.88
Cervicoprostatic incision	02	0.59
Endoscopic Internal Urethrotomy + TURB	02	0.59
Endoscopic Internal Urethrotomy + vaporisation	01	0.29
Total	338	100

TURP was the most common endoscopic procedure, i.e. 44.67%.

Table 6. *Patient Distribution by Laparoscopic Technique*

Laparoscopic Technique	Number	Percentage (%)
Nephrectomy	02	25.00
Varicocelectomy	02	25.00
Exploratory laparoscopic surgery	02	25.00
Ureterolithotomy	01	12.5
Kidney kystectomy	01	12.5
Total	08	100

Nephrectomy and varicocele repair under laparoscopic surgery were performed in 2 cases each.

Figure 1. *Endoscopic view of flexible laser ureteroscopy of a pyelic stone. Urology Department, Kati Pr Bocar Sidy Sall University Hospital .*

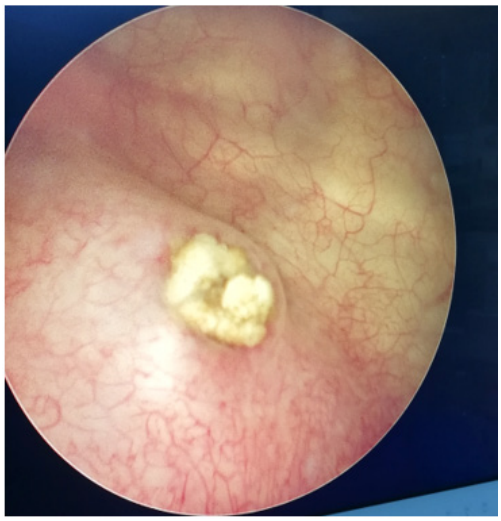

Figure 2. *Endoscopic view of a stone embedded in the right ureteral meatus. Urology Department, Kati Pr Bocar Sidy Sall University Hospital*

4. Discussion

Out of a total of 512 patients operated on during this study period, 346 patients underwent minimally invasive surgery, representing 67.57% of the department's surgical activity. The frequency of minimally invasive surgery is increasing in the urology department. Minimally invasive surgery accounted for 28% in 2021, 32% in 2022, and 40% in 2023. The most represented age group in our study was 61-80 years old, with a mean age of 59.

In our department, minimally invasive surgery was introduced in 2018 through lower urinary tract endoscopy. Our main activities are transurethral resection of the prostate, transurethral resection of the bladder, endoscopic internal urethrotomy, and laser ureteroscopy.

In this study, functional signs were dominated by lower urinary tract symptoms in 56.4% of cases, hematuria in 18.7% of cases, low back pain and nephrotic colic in 11.1% of cases. Minimally invasive surgery was dominated by lower urinary tract endoscopy. Transurethral resection of the prostate (TURP) represented 44.08% of cases in our study, it was also the most frequent in the study of Sikpa KH and al. [5]. In Chad in 2015, Mahamat and al. [6] found 26.1% in their study. In Ivory Coast in 2023, it represented 22.92% in the study of Avion and al. [7]. Transurethral resection of the bladder (TURB) represented 28% of surgical endoscopy activities in our study. It was 6.36% in the study by Avion and al. [7], as well as in the study by Mahamat and al. [6] in Chad, i.e., 7%. TURP and TURB were also the most common endoscopic surgical activities in the study by Halidou and al. [8] in Niger.

Delongchamps NB and al. [9] emphasized that the electrical endoscopic alternatives are monopolar or bipolar vaporization, as well as bipolar resection, which seemed to provide functional results close to those of TURP and adenomectomy, with the advantage in terms of reducing the risk of bleeding. Our prostate and bladder resections were bipolar resections, and

we performed a few cases of bipolar vaporization of the prostate. Endoscopic internal urethrotomy (EUI) represented 7.7% of cases in our study, it was 9.55% in the study of Avion [7] and 28.7% in Mahamat [6]. EUI has an important place in the management of short strictures of the male urethra, Dje K and al [10] reported 140 cases in their study.

Laser ureteroscopy is currently the gold standard in the management of upper urinary tract stones in our department. Laser ureteroscopy and percutaneous nephrolithotomy (PCNL) are currently the standard treatment for upper urinary tract stones [11, 12, 13, 14, 15, 16]. Laser ureteroscopy accounted for 2.95% of surgical endoscopy activities in our study. Doizi, S and al. [17], reported ureteroscopy as the most commonly performed surgical treatment for urinary stones in their institution along with PCNL. PCNL was not performed in our department due to a lack of equipment. Ryan, O.K. and al. [18], reported that minimally invasive surgery had reduced postoperative hospital stay and decreased blood loss in their work.

Minimally invasive laparoscopic surgery is also becoming increasingly performed in different centers. It allows for accurate diagnosis of intra-abdominal testicular ectopy [19], and cryptorchidism [20]. These authors [19, 20], suggest the usefulness of laparoscopic surgery in urology. Minimally invasive laparoscopic surgery has just been started in our center and we have performed 8 cases in our study.

Treuthardt C [21], reports that the laparoscopic approach appears to be a valid option for the treatment of kidney cancer, as well as for certain benign renal pathologies. That the immediate benefits of laparoscopy are well established: less blood loss, reduced postoperative pain, shortened convalescence time, and better cosmetic results. We have successfully performed 2 cases of laparoscopic nephrectomy. According to Bentani N and al. [22], laparoscopic pyeloplasty is an effective technique with very good short- and medium-term results. The insertion of the jj catheter by antegrade approach and the pyeloureteral anastomosis by 2 hemi-overstitches were for them the key to success in reducing the operating time. Minimally invasive surgery in urology is increasingly becoming the standard treatment for surgical activities in urology. Our prospects for improving the quality of care are the acquisition of PCNL equipment and strengthening laparoscopic surgery.

5. Conclusion

Minimally invasive surgery is progressing in our urology department. It has revolutionized the management of urological pathologies. This technique must be encouraged to improve the quality of patient care as well as the comfort of practitioners. It represents a significant part of our surgical activity, reaching up to 80% of surgical activities in urology.

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Approval of the Research Protocol

The study received approval from the Kati University Hospital Scientific and Evaluation Committee.

Informed Consent

All patients provided informed consent before the study began.

Conflicts of interest

The authors declare no conflicts of interest.

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