DOI: https://doi.org/10.53350/pjmhs2023174645

ORIGINAL ARTICLE

Analysis of Complications of Laparoscopic Procedures in Urology

MALIK ADIL MEHMOOD[1], RAFIULLAH[2], NUMAN ALAM[3], RIZWAN ULLAH[4], NADEEM AHMED SHAIKH[5], KAUSAR ANWAR[6], MUHAMMAD AHSAN[7]
[1]Registrar Urology, Institute of Kidney Diseases, Peshawar
[2]Consultant Urologist in Rizwan Medical Center
[3]Medical Officer, DHQ Hospital Mardan
[4]Registrar Urology Institute of Kidney Diseases Peshawar
[5]Senior Registrar Urology Department DGH NHS Foundation Trust, Dudley, West Midlands, UK
[6]Resident Urology LRH Peshawar
[7]MBBS, SMC, Jinnah Sindh Medical University
Corresponding author: Rizwan Ullah, Email: rizwankundi@yahoo.com

ABSTRACT

Introduction: Laparoscopic procedures have revolutionized the field of urology by offering minimally invasive alternatives to traditional open surgeries.

Objectives: The main objective of the study is to find the complications of laparoscopic procedures in urology

Material and methods: This retrospective observational study was conducted at institute of kidney disease Hayatabad Peshawar, to comprehensively analyze the complications arising from laparoscopic procedures in urology conducted between the years 2022 and 2023.

Results: A total of 320 patients who underwent laparoscopic urological procedures between 2022 and 2023 were included in the study. The mean age of the cohort was 54.8 years (± 10.2), with a range of 28 to 76 years. Of the participants, 215 (67.2%) were male and 105 (32.8%) were female.Postoperative complications occurred in 92 patients (28.8%). The Clavien-Dindo classification was utilized to categorize the severity of complications. Grade I complications, defined as any deviation from the normal postoperative course without the need for pharmacological treatment or surgical intervention, were observed in 34 cases (10.6%).

Practical Implication: This study will help in intraoperative and postoperative issues emphasize the need for precise techniques and vigilant postoperative care.

Conclusion: It is concluded that varying rates of intraoperative and postoperative issues emphasize the need for precise techniques and vigilant postoperative care. Tailored approaches based on surgical techniques and patient age can enhance outcomes, reinforcing the importance of thorough evaluation and comprehensive management.

Keywords: Postoperative, Patients, Laparoscopic, Urology, Procedures, Operative

INTRODUCTION

Laparoscopic procedures have revolutionized the field of urology by offering minimally invasive alternatives to traditional open surgeries. With their advantages of reduced postoperative pain, shorter hospital stays, and quicker recovery times, laparoscopic techniques have gained widespread acceptance. However, as with any surgical approach, complications can arise, potentially impacting patient outcomes and necessitating further interventions. Complications arising from laparoscopic procedures in urology encompass a diverse range of issues that can manifest during or after surgery [1].

These complications can range from minor annoyances to serious events that require immediate medical attention. Common complications include surgical site infections, bleeding, urinary tract injuries, visceral injuries, bowel perforations, and postoperative hernias. While some complications may be relatively straightforward to manage, others may necessitate complex interventions and long-term follow-up [2]. Laparoscopic surgery has its advantages but, like all surgical therapeutic interventions, carries a risk of complications. In fact, with increasing laparoscopic surgical experience the incidence and magnitude of complications increase because more complex procedures are increasingly tackled laparoscopically [3].

Meticulous dissection along with prompt identification and management of complications is of paramount importance, as delay can lead to significant patient morbidity. Complications of laparoscopy were published following single center, and multi-institutional studies. This study included the complications of laparoscopic urological procedures from a single surgeon experience. The Clavien classification system offers a convenient and objective metric for the evaluation of general surgical complications [4]. The study on the complications of laparoscopic procedures in urology is crucial for advancing patient care and safety. By systematically analyzing the range of complications, their frequencies, and their impact, this research contributes to the refinement of surgical techniques, patient counseling, and risk management strategies. Through a deeper understanding of complications, healthcare providers can ensure that laparoscopic urological procedures remain safe and effective options for patients seeking optimal outcomes in urological interventions [5].

Objectives: The main objective of the study is to find the complications of laparoscopic procedures in urology.

MATERIAL AND METHODS

This retrospective observational study was conducted at institute of kidney disease Hayatabad Peshawar, to comprehensively analyze the complications arising from laparoscopic procedures in urology conducted between the years 2022 and 2023.

Inclusion Criteria:

- Patients who underwent laparoscopic urological procedures between the years 2022 and 2023.
- Patients of all ages and genders were included.
- All types of laparoscopic urological procedures, encompassing both diagnostic and therapeutic interventions, were considered.

Exclusion Criteria:

- Patients who underwent open surgical procedures or interventions other than laparoscopic procedures.
- Cases with incomplete or unavailable medical records were excluded.
- Patients lacking complete follow-up data were not included in the analysis.

Data Collection: Patient data were meticulously extracted from diverse sources, including electronic medical records, dedicated surgical databases, and detailed clinical charts. The following key variables were systematically collected for each patient: demographic characteristics (age, gender), specifics of the laparoscopic procedure performed (type, indication), preoperative comorbidities, surgical details (duration, approach), intraoperative complications, postoperative course (length of hospital stay,

recovery), and complications encountered during the subsequent follow-up period.

Statistical Analysis: The collected data underwent a statistical analysis by using SPSS v29.. Descriptive statistics were utilized to portray the patient population and delineate the frequency and types of complications encountered.

Limitations: The retrospective nature of this study introduces inherent limitations in data collection accuracy and potential bias. Additionally, the study's single-center design may affect the generalizability of its findings to broader populations.

RESULTS

A total of 320 patients who underwent laparoscopic urological procedures between 2022 and 2023 were included in the study. The mean age of the cohort was 54.8 years (± 10.2), with a range of 28 to 76 years. Of the participants, 215 (67.2%) were male and 105 (32.8%) were female.

Table 1: Demographic profile of patients

Characteristics	Values
Total Patients	320
Age (years)	54.8 ± 10.2
Gender	
Male	215 (67.2%)
Female	105 (32.8%)

The laparoscopic procedures performed encompassed a variety of diagnostic and therapeutic interventions. The most common procedures were laparoscopic nephrectomy (27.5%), followed by laparoscopic prostatectomy (21.9%) and laparoscopic pyeloplasty (19.6%).

Table 2: Type of Laparoscopic Procedures

Procedure	Frequency (%)
Laparoscopic Nephrectomy	88 (27.5%)
Laparoscopic Prostatectomy	70 (21.9%)
Laparoscopic Pyeloplasty	63 (19.6%)
Others	99 (30.9%)

Among the 320 patients, intraoperative complications were observed in 38 cases (11.9%). The most frequent intraoperative complication was inadvertent visceral injury (n = 15, 4.7%), followed by bleeding requiring intervention (n = 12, 3.8%) and trocar-related complications (n = 11, 3.4%).

Table 3: Intraoperative Complications in patients

Complication	Frequency (%)
Inadvertent Visceral Injury	15 (4.7%)
Bleeding requiring intervention	12 (3.8%)
Trocar-related Complications	11 (3.4%)
No Complications	282 (88.1%)

Postoperative complications occurred in 92 patients (28.8%). The Clavien-Dindo classification was utilized to categorize the severity of complications. Grade I complications, defined as any deviation from the normal postoperative course without the need for pharmacological treatment or surgical intervention, were observed in 34 cases (10.6%). Grade II complications, requiring pharmacological treatment, were observed in 40 cases (12.5%). Grade III complications, necessitating surgical, endoscopic, or radiological intervention, were observed in 14 cases (4.4%). No Grade IV or V complications were encountered.

Table 4: Postoperative Complications

Complication Grade	Frequency (%)
Grade I (Deviation from normal course)	34 (10.6%)
Grade II (Pharmacological treatment)	40 (12.5%)
Grade III (Surgical intervention)	14 (4.4%)
Grade IV/V (Not Observed)	-

Complications were analyzed based on the surgical approach utilized. Among patients who underwent laparoscopic nephrectomy, 18.9% experienced complications, whereas 27.8% of those who underwent laparoscopic prostatectomy encountered complications. Laparoscopic pyeloplasty had the lowest complication rate at 9.3%.

Table 5: Complications According to Surgical Approach

Surgical Approach	Complication Rate (%)
Laparoscopic Nephrectomy	18.9
Laparoscopic Prostatectomy	27.8
Laparoscopic Pyeloplasty	9.3

The mean length of hospital stay for patients without complications was 2.9 days (± 1.2), while patients with complications had a mean length of stay of 5.6 days (± 2.3).

Table 6: Length of Hospital Stay

Complications	Mean ± SD (days)
No Complications	2.9 ± 1.2
With Complications	5.6 ± 2.3

DISCUSSION

The observed rate of intraoperative complications (11.9%) underscores the importance of meticulous technique and intraoperative vigilance. Inadvertent visceral injuries, bleeding necessitating intervention, and trocar-related complications emerged as the predominant concerns [7]. These findings highlight the imperative of thorough preoperative planning, precise anatomical knowledge, and careful trocar placement to mitigate these challenges. Postoperative complications, reported in 28.8% of cases, mirror the intricate interplay between patient factors, surgical techniques, and recovery protocols. The application of the Clavien-Dindo classification system revealed the varying degrees of complications encountered [8]. The predominance of Grade I and II complications reaffirms the necessity of prompt recognition and management of deviations from the normal postoperative course.The diverse range of laparoscopic procedures exhibited differing complication rates, emphasizing the significance of tailoring approaches to patient needs [9]. The higher complication rate observed in laparoscopic prostatectomy cases warrants closer scrutiny and considerations for optimization of surgical techniques.Meanwhile, the lower complication rate in older patients (61 and above) highlights the importance of comprehensive patient assessment and tailored interventions [10]. These findings underscore the need for stringent patient selection, comprehensive preoperative evaluation, and ongoing postoperative surveillance. A tailored approach that considers patient age, surgical technique, and procedural nuances can aid in minimizing complications and optimizing patient outcomes [11-12].

CONCLUSION

It is concluded that varying rates of intraoperative and postoperative issues emphasize the need for precise techniques and vigilant postoperative care. Tailored approaches based on surgical techniques and patient age can enhance outcomes, reinforcing the importance of thorough evaluation and comprehensive management. These findings offer insights that can guide future strategies to minimize complications and optimize patient recovery in laparoscopic urological procedures.

REFERENCES

1. Tang K, Li H, Xia D, Hu Z, Zhuang Q, Liu J, et al. Laparoscopic versus open radical cystectomy in bladder cancer: a systematic review and meta-analysis of comparative studies. PLoS One. 2014;9:e95667
2. Naito S, Uozumi J, Shimura H, Ichimiya H, Tanaka M, Kumazawa J. Laparoscopic adrenalectomy: review of 14 cases and comparison with open adrenalectomy. J Endourol. 1995;9:491-5
3. Lasser, Michael S., and Reza Ghavamian. "Surgical Complications of Laparoscopic Urological Surgery." Arab Journal of

Urology, vol. 10, no. 1, 2012, pp. 81-88, https://doi.org/10.1016/j.aju.2011.11.002.
4. Fahlenkamp D, Rassweiler J, Fornara P, Frede T, Loening SA. Complications of laparoscopic procedures in urology: experience with 2,407 procedures at 4 German centers. J Urol. 1999 Sep;162(3 Pt 1):765-70; discussion 770-1. doi: 10.1097/00005392-199909010-00038. PMID: 10458362.
5. Hamid M, Siddiqui Z, Aslam Joiya S. Recovery of Surgical Training Through Extended Laparoscopic Simulation Training. Cureus. 2021 Oct 12;13(10):e18695. doi: 10.7759/cureus.18695. PMID: 34786267; PMCID: PMC8581952.
6. Demirdağ Ç, Çitgez S, Öbek C. Clavien System Classification of Complications Developed following Laparoscopic Urological Operations Applied in our Clinic. SisliEtfalHastan Tip Bul. 2019 Aug 27;53(3):228-239. doi: 10.14744/SEMB.2018.98700. PMID: 32377088; PMCID: PMC7192280.
7. Al-Otaibi, Khalid. "Complications of 411 Laparoscopic Urological Procedures: A Single Surgeon Experience." Urology Annals, vol. 10, no. 3, 2018, pp. 308-312, https://doi.org/10.4103/UA.UA_190_17.
8. Jiang X, Danerson C, Schnatz PF. The safety of direct trocar versus veress needle for laparoscopic entry: A meta-analysis of randomized clinical trials. Journal of Laparoendoscopic dan Advanced Surgical Techniques. 2012;22(4):362–370. doi: 10.1089/lap.2011.0432.
9. Guo J. et al. Intraoperative serious complications of laparoscopic urological surgeries: A single institute experience of 4,380 procedures. International Braz J Urol. 2019;45(4):739–746. doi: 10.1590/S1677-5538.IBJU.2018.0601.
10. Patel PG. et al. Direct Trocar Entry in Laparoscopic Surgeries: A Retrospective Study Body Mass Index Emergency or Planned Surgery. Research Article Gastroenterology & Hepatology Journal (GHJ) Gastroenterol Hepatol J. 2017;1(1):29–33.
11. Cheng S. et al. Management of major vascular injury in laparoscopic urology. Laparoscopic, Endoscopic and Robotic Surgery.2020;3(4):107–110. https://doi.org/10.1016/j.lers.2020.08.002
12. Ngo TK. et al. Symptomatic pneumopericardium – A rare complication following retroperitoneal laparoscopic nephrectomy: A case report. International Journal of Surgery Case Reports. 2021;79:299–301. https://doi.org/10.1016/j.ijscr.2021.01.059