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Original Research Article

Incidence of complications in gynaecological laparoscopic surgeries: a prospective study from a single tertiary care centre

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ABSTRACT

Background: Laparoscopy is a widely utilized procedure in gynecology due to its minimally invasive nature, offering numerous benefits such as reduced postoperative pain, quicker recovery, and shorter hospital stays. However, as with all surgical procedures, complications may arise, particularly in more complex surgeries. This study aimed to evaluate the incidence of complications associated with gynecological laparoscopic surgeries performed at a single centre.
Methods: A total 248 patients undergoing laparoscopic gynecological procedures at the centre during the study period were included. Informed consent was obtained from each patient, outlining the risks and the possibility of conversion to laparotomy if necessary. The study evaluated patient demographics, surgical history, body mass index (BMI), types of procedures performed, hospital stay durations, and the incidence of major and minor complications.
Results: Mean age of 31.51±8.79 years. Diagnostic laparoscopy was performed in 39.51% of cases, while advanced procedures accounted for 27.01%. Complications occurred in 21 patients (8.47%), with major complications seen in 2 patients (0.80%) and minor complications in 12 patients (4.84%). Laparoscopic hysterectomy had the highest complication rate at 18.33%, and 6 patients required conversion to laparotomy. No complications were observed in diagnostic or minor surgeries.
Conclusions: Laparoscopic surgery in gynecology is generally safe, with an overall complication rate of 8.47%, which aligns with reported literature. Complications were more frequent in complex procedures and in patients with previous abdominal surgeries. Continued improvements in surgical techniques and patient selection are essential for further reducing complication rates and enhancing surgical outcomes.

Keywords: Complications, Gynecological surgery, Laparoscopy, Minimally invasive surgery

INTRODUCTION

Laparoscopy is among the most frequently performed procedures by gynecologists and is regarded as a revolutionary technique due to its safety and minimally invasive nature.[1] This approach is favoured for its numerous benefits, including quicker recovery, shorter hospital stays, reduced postoperative pain, and minimal blood loss.[2] Over time, laparoscopic surgery has evolved from a diagnostic tool for assessing acute and chronic pelvic pain, amenorrhea, and fertility issues, to a key surgical method for addressing a wide range of gynecological conditions. These include ectopic pregnancies, abdominal masses, hysterectomies for menstrual disorders, and even the staging and treatment of gynaecological cancers.[3,4] Despite its benefits, laparoscopic surgery carries risks, as with any surgical procedure. In gynecology, where patients are often young and otherwise healthy, the consequences of significant complications, though rare, can be severe.[5] Reported overall complication rates vary from 0.2% to 10.3%, with the risks being influenced by the complexity of the procedure and the surgeon's level of experience.[6,7] This study aimed to assess the incidence of complications

associated with laparoscopic gynaecological surgeries performed at our centre in the department of obstetrics and gynecology over the course of one year.

METHODS

This single-centre, prospective, descriptive, and observational study was conducted over a period of one year, from October 2017 to September 2018, after obtaining approval from the hospital ethical committee. The study included all patients undergoing gynaecological laparoscopic procedures at our centre in the department of obstetrics and gynecology. Prior to the procedures, informed consent was obtained from each patient, ensuring they were aware of the risks and potential complications associated with laparoscopic surgeries, as well as the possibility of conversion to laparotomy if the procedure could not be completed laparoscopically.

The inclusion criteria encompassed a range of laparoscopic surgeries. Diagnostic laparoscopic procedures were performed for conditions such as pelvic pain, infertility, pelvic inflammatory disease (PID), and adnexal masses, provided no further surgical interventions were required. Minor laparoscopic surgeries included minimal adhesiolysis, treatment of minimal endometriosis, ovarian biopsies, and ovarian punctures. Major laparoscopic surgeries involved well-established procedures such as treatment for ectopic pregnancies, PID, polycystic ovaries, benign ovarian cysts, distal tubal plasty, uterine suspension, extended adhesiolysis, and management of moderate to severe endometriosis. Advanced laparoscopic surgeries included more complex operations like hysterectomies, myomectomies, lymphadenectomies, colposuspension, tubal recanalization, surgeries for genital prolapse, and procedures for gynaecological cancers. The study excluded laparoscopic tubal sterilizations from the analysis.

RESULTS

The study included 248 patients with a mean age of 31.51±8.79 years. Of these, 51.83% were nulliparous and presented to the hospital due to infertility. The majority of patients had a normal BMI, ranging from 18.5 to 24.9 (58.06%), with a mean BMI of 24.01±3.58 kg/m^2 and a range of 18 to 33 kg/m^2. Most patients had no prior surgical history, with 231 (93.14%) reporting no previous surgeries. The most frequently performed laparoscopic procedure was diagnostic laparoscopy, carried out in 87 patients (35.08%). This was followed by laparoscopic hysterectomy in 60 patients (24.2%), laparoscopic cystectomy in 46 patients (18.55%), salpingectomy in 17 patients (6.85%), adhesiolysis in 16 patients (6.45%), and hysteroscopy in 11 patients (4.44%). Other less common procedures included single cases of ovarian drilling, recanalization, colposuspension, vaginoplasty, and Wertheim's hysterectomy. Laparoscopic procedures were categorized according to the complexity of the procedures (Table 1).

Table 1: Distribution of patients according to the complexity of procedures.

Laparoscopic procedure	Total cases	Rate
Diagnostic procedure	98	39.51
Minor laparoscopic surgery	20	8.06
Major laparoscopic surgery	63	25.40
Advanced laparoscopic surgery	67	27.01
Total	248	100

Table 2: Complications during gynecological laparoscopies.

Complications during laparoscopy	Number of patients	Rate
Major complications	2	0.80
Rectal injury	1	0.40
Serious bleeding complication	1	0.40
Minor complication	12	4.84
Anemia (transfusion)	7	2.82
Secondary hemorrhage	1	0.40
Fever	2	0.80
Abdominal distension	2	0.80
Failed laparoscopy	7	2.823
Total	21	8.47

Complex laparoscopic surgeries, such as Wertheim's hysterectomy, vaginoplasty, colposuspension, and recanalization, were successfully performed. The majority of patients had a hospital stay of ≤2 days, observed in 72.18% of cases. Overall, complications were observed in 21 patients (8.47%). Complications were classified into major, minor, and failed laparoscopy (Table 2).

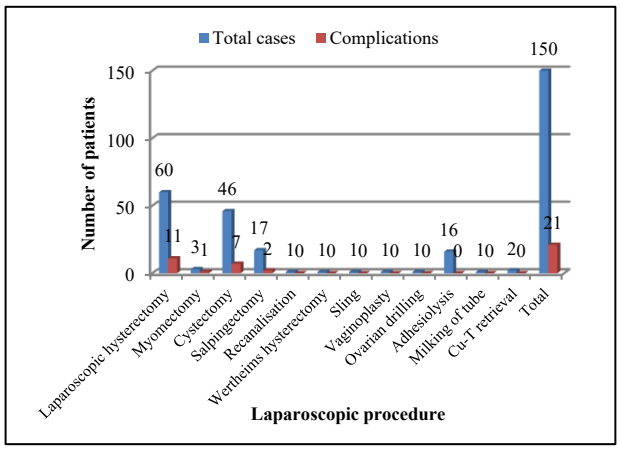

Figure 1: Rate of complications occurring during operative laparoscopy procedures

Major complications occurred in 2 patients (0.80%) and included one rectal injury (0.40%) and one instance of

serious bleeding (0.40%). Minor complications were seen in 12 patients (4.84%) and included anaemia in 7 patients (2.82%), abdominal distension and fever in 2 patients each (0.80%), and secondary haemorrhage in 1 patient (0.40%). Laparoscopy failed (conversion to laparotomy without complications) in 7 patients (2.82%). Laparoscopic hysterectomy had the highest complication rate, with 11 out of 60 patients (18.33%) experienced complications (Figure 1).

Table 3: Rates of complication occurring during operative laparoscopy procedures.

Operation	Complications	Rate (%)	Laparotomy (rate)
Laparoscopic hysterectomy	11/60	18.33	6 (54.5)
Myomectomy	1/3	33.33	0
Cystectomy	7/46	15.22	3 (42.86)
Salpingectomy	2/17	11.8	0
Adhesiolysis	0/16	-	-
Wertheim's hysterectomy	0/1	-	-
Sling	0/1	-	-
Vaginoplasty	0/1	-	-
Ovarian drilling	0/1	-	-
Recanalisation	0/1	-	-
Cu-T retrieval	0/2	-	-
Total	21/150	14	42.86

Table 4: Complication of gynecological laparoscopic procedure according to the level of complexity of procedure.

Laparoscopic procedure	Total cases	Complication	Rate
Diagnostic procedure	98	-	-
Minor laparoscopic surgery	20	_	-
Major laparoscopic surgery	63	9	42.86
Advanced laparoscopic surgery	67	12	57.14
Total	248	21	100

Of these, 6 patients (54.5%) required laparotomy. No complications were reported for the Cu-T retrieval, adhesiolysis, milking of tube, ovarian drilling, recanalization, Wertheim's hysterectomy, or vaginoplasty procedures. The complications according to the level of complexity of the procedure has been shown in the Table 3.

The highest complication rates were observed in advanced laparoscopic surgeries, with 12 complications out of 67 procedures (57.14%). No complications were reported for diagnostic procedures or minor laparoscopic surgeries.

DISCUSSION

Laparoscopy is generally considered a safe procedure, but it is not without risks of serious complications, which surgeons must be aware of. While numerous studies have investigated the complications associated with laparoscopy, many are retrospective and may underreport certain complications. In our study, complications occurred in 21 patients, representing 8.47% of the total cohort. Complications were categorized into major, minor, and failed laparoscopy, as detailed in Table 2. Failed laparoscopy was recorded when procedures could not be completed due to technical difficulties or dense adhesions, such as those encountered with endometriosis or prior surgeries.

Major complications were observed in 2 patients (0.80%), including one rectal injury and one instance of serious bleeding. The rectal injury occurred during a laparoscopic hysterectomy due to dense adhesions between the rectum and uterus, while the serious bleeding resulted from an injury to a major vessel. Both major complications were managed through laparotomy. These findings are consistent with studies by Fuentes et al and Johnston et al which reported major complication rates of 1.93%, 1.9%, and 0.6%, respectively.[8,9]

Minor complications were found in 12 patients (4.84%), similar to Fuentes et al, who reported minor complications in 4.29% of their patients. These minor complications included anaemia, managed with blood transfusions, as well as abdominal distension, fever, and secondary haemorrhage.[8] Failed laparoscopy occurred in 7 patients (2.82%). This rate is comparable to Fuentes et al, who reported a failed laparoscopy rate of 3.57%.[8] Failures included 3 cases during cystectomy for endometriotic cysts, where dense adhesions necessitated conversion to laparotomy, and 4 cases during laparoscopic hysterectomy, including one with a history of two previous

caesarean sections and dense intraoperative adhesions. The remaining three cases were converted due to technical difficulties.

The overall complication rate of 8.47% in our study is encouraging and falls within the range reported in various studies, from 0.1% to 10.3%. This rate aligns with findings from Emile et al, Nazik et al, and Attiya et al, which reported complication rates of 5.9%, 7.7%, and 5.8%, respectively.[10-12] In contrast, studies by Tarik et al, Qung et al reported lower complication rates of 3%, 1.88%, and 1.29%, respectively, which may be attributed to the higher experience levels of surgeons in these studies.[13,14]

Laparoscopic hysterectomy had the highest complication rate, with 11 out of 60 patients (18.33%) experiencing complications. This finding is consistent with Jensen et al, who also reported the highest complication rates associated with laparoscopic hysterectomy.[15]

Risk factors such as obesity, being underweight, and a history of previous surgery are correlated with increased complication rates. Although the mean BMI of patients with and without complications was similar in our study, the presence of prior abdominal surgery was a significant risk factor. Patients with a history of abdominal surgery had a complication rate of 11.7%, compared to 8.6% in those without prior surgeries. Increased conversion rates to laparotomy in patients with previous surgeries can be attributed to the presence of abdominal and pelvic adhesions, which complicate the procedure. Fuentes et al also found that prior abdominal surgery significantly increased the risk of serious complications and failed laparoscopy attempts.[8]

Our study also indicates that complication rates are closely related to the complexity of the procedure. No complications were reported during diagnostic or minor procedures. However, as the procedural complexity increased, so did the complication rate. Shiota et al.16 similarly found that higher levels of surgical difficulty were associated with increased overall complication rates and a higher likelihood of conversion to laparotomy or failed laparoscopy.

The mean hospital stay for patients in our study was 2.2 days, which is consistent with findings from Mboudou et al, who reported a mean stay of 3.4 days, and Fuentes et al., who reported a mean of 1.42 days.[8]

The size and duration of our study limited our ability to detect the role of learning curve in laparoscopic surgery. Large number of surgeons were included in the study which may have resulted in wide variety of technique and skill level.

CONCLUSION

Our study demonstrated that laparoscopic surgery is a generally safe procedure, with no reported mortality during the study period. The overall complication rate was 8.47%, which falls within the range reported in the literature (0.1% to 10.3). Complications were more frequent in complex procedures and those involving prior abdominal surgery highlighting the need for careful patient evaluation and tailored surgical approaches. Despite these challenges, laparoscopic surgery offers significant benefits, including shorter hospital stays, reduced blood loss, and faster recovery. As surgical experience and techniques improve, the complication rate is expected to decrease further. Continued attention to surgical technique and patient factors is crucial for further reducing complications and improving patient outcomes in laparoscopic gynaecological surgery.

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