

# Complications of gynecological laparoscopy: experience of a single center

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## Summary

**Background:** The purpose of this study was to describe the prevalence and type of laparoscopic complications seen in a teaching hospital. **Materials and Methods:** Four hundred and forty-one diagnostic and operative laparoscopic procedures were performed by the same senior resident/resident surgical team. Direct entry technique was used for all procedures. **Results:** The procedures included 74 (16.8%) diagnostic and 367 (83.2%) operative laparoscopies. The overall complication rate was 7.7% (34 cases). Conversion to laparotomy occurred in 16 cases (3.6%). **Conclusions:** The complication rate was found to be slightly higher than the rates quoted in the literature. This rate of 7.7% is still an acceptable one.

**Key words:** Laparoscopy; Complication; Gynecology; Conversion to laparotomy.

## Introduction

Minimally invasive surgery, like modern laparoscopic surgery, is commonly used throughout the world because it is more advantageous than open procedures. The incidence of major and minor complications from laparoscopic procedures ranges from 0.1%-10% [1-5]. The rapid increase in the number of procedures being performed, the introduction of new equipment, and variability in the training of surgeons all contribute to the complication rate. It is well known that there is a strong correlation between the complication rate and the surgeon's level of experience. The more experience a surgeon has, the lower the complication rate.

The aim of this study was to describe the prevalence and types of gynecological laparoscopic complications based on the 441 diagnostic and operative laparoscopies that were performed.

## Materials and Methods

Medical records of patients undergoing laparoscopies were reviewed in a retrospective study between the dates of October 1, 2010 and February 29, 2012. The setting was a tertiary regional teaching hospital with 606 beds. The laparoscopic procedures were divided into the following: minor procedures (sterilization, minimal adhesiolysis, and minimal endometriosis), major procedures (drainage of abscesses, uterine and colposuspension, ectopic pregnancies, and severe endometriosis) and advanced laparoscopic surgery (hysterectomy, myomectomy, tubal reanastomosis, and pelvic/para-aortic lymphadenectomies). All of these procedures were usually performed by the same senior resident/resident surgical team.

### Operative techniques

Patients were placed in the lithotomy position and underwent general anesthesia. A manipulator was placed into the uterine

cavity when appropriate and necessary and a urinary catheter was routinely inserted. Direct entry technique was used in all procedures. The video recorder began to record prior to trocar placement for all laparoscopic procedures. If the patient had a history of prior abdominal surgery, a ten- mm trocar was placed in the left upper quadrant or just below the epigastric region after orogastric tube placement was performed. Intraperitoneal insufflation was performed with an intraabdominal pressure of < 15 mmHg. Two additional five- mm satellite trocars were placed in each ileoinguinal area, and if necessary a third satellite trocar was placed in the left upper quadrant. Hemostasis was established with both monopolar/bipolar cautery, clips or sutures. Intraabdominal suturing was the modality of choice for hemostasis in the area of the vaginal cuff during a hysterectomy, for ovarian detortion sutures or myomectomies. The duration of hospital stay was determined by the type of procedure and the patient's rate of recovery.

Chi Square testing was used to determine the relationship between nominal variables and gynecological laparoscopic complications;  $p < 0.05$  was considered statistically significant.

## Results

A total of 441 gynecologic laparoscopic procedures were enrolled in the study. The median age was 34 years (range, 14-71) and Body mass index (BMI) 26 kg/m<sup>2</sup> (range, 17-40). The procedures included 74 (16.8%) diagnostic scopes and 367 (83.2%) operative scopes. The most commonly performed operations were ovarian cystectomies 30.4% (134 cases) and sterilizations 19% (Figure 1). The other advanced laparoscopic procedures that were performed were hysterectomies (9.3%), utero colposuspensions (2.5%), myomectomies (2.5%), tubal reanastomosis (0.9%), and endometrial cancer staging (0.7%).

The overall complication rate was 7.7% (34 cases) (Figure 2). There were no significant differences between cases with complications and without complications with respect to age and BMI ( $p > 0.05$ ). The types of complications that occurred were: intestinal injury 1.6% (seven cases), urinary

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Types of Gynecologic Laparoscopic Procedures

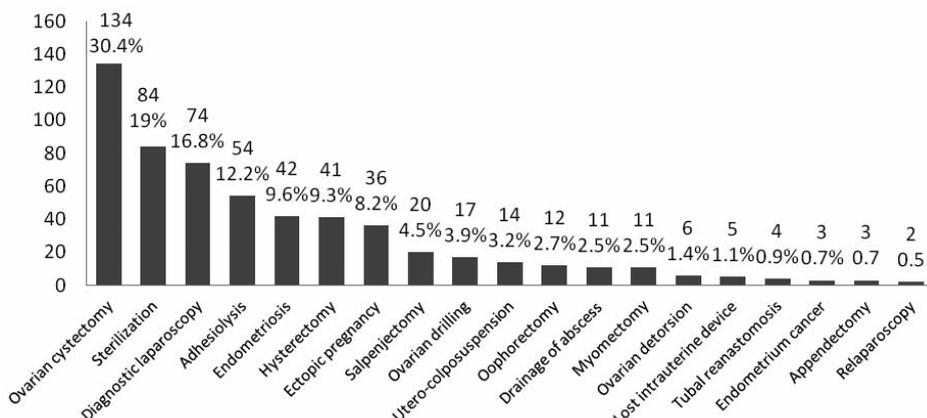


Figure 1. — Types of gynecologic laparoscopic procedures.

The Distribution of Complications (34 Cases)

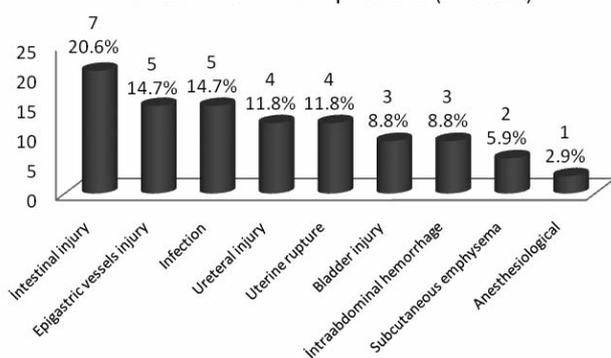


Figure 2. — Frequency of laparoscopic complications.

Conversion to Laparotomy

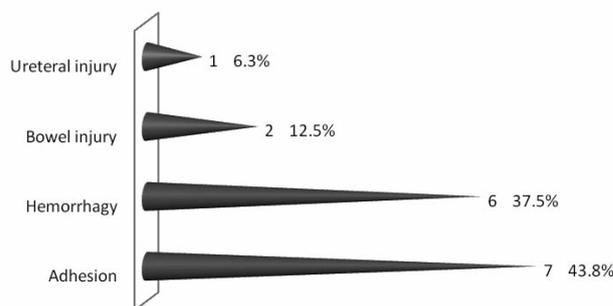


Figure 3. — Reasons for conversion to laparotomy.

tract injuries 1.6% (seven cases), epigastric vessel injury 1.1% (five cases), postoperative infection 1.1% (five cases), uterine rupture 0.9% (four cases), intraabdominal hemorrhage 0.7% (three cases), subcutaneous emphysema 0.5% (two cases), and postoperative hypoxia 0.2% (one case). The laparoscopic complications occurred in four of the diagnostic cases (0.9%) and 30 (6.8%) of the major/advanced cases. When reviewing the relationship between the complication rate and type of operation, complications associated with hysterectomy were the most common (eight out of 41 cases, 19.5%), followed by ovarian cystectomies (11 out of 134 cases, 8.2%), and adhesiolysis (three out of 54 cases, 5.6%).

Conversion to laparotomy occurred in 16 out of 441 cases, 3.6% (Figure 3). The most common reason for conversion to laparotomy was dense adhesions (seven out of 16 cases, 43.8%) and uncontrolled intraabdominal hemorrhage (six out of 16 cases, 37.5%).

**Discussion**

Despite advanced technology and experience, laparoscopic complications remain a major cause of morbidity. The

complication rate is directly proportional to the complexities of the surgical procedures and the surgeon’s experience level [6]. According to the present 1.5 year data, the complication rate for gynecological laparoscopies performed in this regional teaching hospital in southern Turkey was comparable to that reported in the literature. The present authors found a complication rate of 7.7%, with no deaths. This rate is slightly higher than that quoted in the literature. However, it is still associated with a respectable mortality rate.

Intestinal injuries were the most common major complications in this series. This incidence was reported between 0.06% to 0.65%. In other large studies, bowel injuries accounted for approximately 20% of all complications and almost half of all major complications by laparoscopy [7-9]. In this study, intestinal complications were seen in seven cases, 1.6% of the time. Two of these complications were repaired by laparotomy and four of them during laparoscopic surgery. On the other hand, a bowel injury was noticed two days after surgery and in this patient, a colostomy was performed.

The reported incidence of bladder and ureteral complications varies from 0.03% to 0.13% in all gynecologic laparoscopies [7-9]. Higher rates of urologic injuries are seen

during complex operative procedures with an incidence ranging from 0.2% to 1.6%. Bladder injuries are two to three times more common than ureteral injuries [7,10]. In the authors' experience, there were four bladder injuries and three ureteral injuries. All of the bladder injuries were repaired laparoscopically and one ureteral injury was converted to laparotomy for repair. All others were repaired laparoscopically with a double J catheter.

The inferior epigastric vessels are the most commonly injured vessels often injured at the time of lateral trocar placement. These vessels should be identified laparoscopically and their course should be observed from the inguinal canal up along the anterior abdominal wall [11]. In the authors' experience, there was one deep epigastric and four inferior epigastric vessels injury. Two balloon tamponade is performed by inflation of a Foley catheter inside the trochar site. After two hours, the balloon is deflated and hemostasis is observed. In three patients with vascular injury, suture ligation of the proximal and distal ends of the vessels was performed transabdominally.

Wound infection following gynecologic laparoscopy was rarely reported, making the incidence difficult to estimate. The majority of wound infections are handled successfully with expectant management, drainage or antibiotics [2]. In the authors' experience, postoperative wound infection occurred in five patients and all patients recovered with antibiotic treatment only.

The most dangerous hemorrhagic complications of entry are from injury to the great vessels, they occurred with a reported incidence ranging from 0.01% to 0.64% [12]. The trauma most often occurs secondary to insertion of an insufflation needle, but catastrophic results may result from the tip of a sharp trochar inserted with closed entry technique. In this study, there was no major vascular injury. Three laparoscopic hysterectomies had to be converted to laparotomies secondary to uncontrolled intraabdominal hemorrhage.

Subcutaneous emphysema most commonly resulted from preperitoneal placement of an insufflation needle or trochar. Subcutaneous emphysema is identified when a patient is found to have crepitus under the skin. Subcutaneous emphysema will usually spontaneously regress within two days [2]. In the authors' experience, subcutaneous emphysema occurred in two patients and patients recovered after one day.

Among the potential complications of general anesthetics are hypoventilation, esophageal intubation, gastroesophageal reflux, bronchospasm, hypotension, narcotic overdose, cardiac arrhythmias, and cardiac arrest. The head down (Trendelenburg's) position, in combination with the increased intraperitoneal pressure provided by pneumoperitoneum increase the incidence of complications related to general anesthesia [3]. In this study there was a postoperative hypoxia and this patient awoke with no problems.

In a review of the literature, the overall rate of conversion to laparotomy was 2.1%. The two most common reasons for conversion to laparotomy were major vascular and in-

testinal injuries [13, 14]. In the authors' experience, conversion to laparotomy rate was 3.6% and most common reasons were dense adhesions and uncontrolled intraabdominal hemorrhage.

## Conclusions

The popularity of minimally invasive surgery is increasing as the amount of laparoscopic procedures being performed daily is increasing. During the 1.5 years of this study, the complexity of procedures being performed also increased. The evaluation of the incidence and the type of complications in this series should be beneficial for developing proper skills as laparoscopic surgeons for future procedures performed.

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