ORIGINAL RESEARCH

Utility of Surgical Glove made for Various Gynecologic Laparoscopic Surgery

Phornsawan Wasinghon[1], Auttaya Ratanakaew[2], Duangporn Panpeng[3]

Abstract

Aim: Laparoscopic surgery has more benefits of less blood loss, shorter hospital length of stay, and less postoperative pain when compared to open surgery. The purpose of this study is to elucidate the benefit of surgical gloves made for various gynecologic diseases in laparoscopy and technical skills in the patients.

Materials and methods: The study was an observational study at Buddhachnaraj Hospital, Phitsanulok, Thailand. The eligible 347 patients were diagnosed gynecologic conditions for laparoscopy between January 2019 and January 2022. The patients were informed and consented to the operations. The closed technique and open technique had designed to create the pneumoperitoneum owing to the diagnosis. The patients were observed for the outcomes after the laparoscopy within 1 month.

Results: The 347 patients were surgery by laparoscopy. The mean age was 44.89 ± 14.627, and the mean BMI was 22.68 ± 1.94 kg/m^2. The mean blood loss and operative time were 89.26 ± 126.87 mL and 107.57 ± 26.07 minutes, respectively. The five most frequent diseases were leiomyoma in 83 patients (23.9%), endometrial carcinoma in 48 patients (13.8%), serous cystedenoma in 45 patients (13%), endometrioma in 33 patients (9.5%), and cervical carcinoma in 28 patients (8.1%). One hundred and sixty patients (46.1%) had undergone a hysterectomy. However, 69 patients (19.9%) had undergone complete surgical staging to diagnose ovarian and endometrial cancer. Fifty-one patients had undergone ovarian cystectomy (14.7%). The number of patients with salpingo–oophorectomy (SO), radical hysterectomy, and myomectomy were 23 (6.6%), 22 (6.3%), and 13 (3.7%), respectively. The patients got the benefit of various gynecologic laparoscopy free of charge on the universal health coverage project.

Conclusion: A feasible handmade cylinder glove with gauzes was inserted transvaginally to accumulate the pneumoperitoneum. Also, the 12-mm trocar was prepared at the middle finger of a surgical glove to accommodate the 10-mm 0°-laparoscope.

Clinical significance: Surgical glove is the advantage of laparoscopic gynecologic surgery.

Keywords: Hysterectomy, Laparoscopic staging, Laparoscopic surgery, Ovarian cystectomy.

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Introduction

Laparoscopic procedures have been proven to have many benefits, including shorter hospital stays, lower intraoperative blood loss, less postoperative pain, lower mortality, fewer wound complications, fewer febrile episodes, and a faster return to activities when compared with the abdominal approach.[1,2] However, laparoscopy can be used to operate on benign and malignant gynecological diseases.[1–5] Nowadays, laparoscopic surgery is an expensive procedure for patients in some institutions. Unfortunately, though, accessibility to laparoscopy is limited in low-income patients. Therefore, an experienced surgeon developed helping instruments for feasible low-cost operations. Also, the Ministry of Public Health in Thailand has developed minimally invasive surgery which is supported by health insurance, the universal health coverage project at the Tertiary Care Referral Centre, Thailand. Hence, laparoscopic surgery for gynecologic diseases is free of charge. The study aims to observe the usefulness of surgical gloves made for various gynecologic laparoscopic surgeries at the Tertiary Care Centre, Thailand.

Materials and Methods

The 347 eligible patients had undergone laparoscopic surgery between January 2019 and January 2022. The study obtained approval from the institutional review board (IRB) of Buddhachinaraj Hospital, Phitsanulok, Thailand; No. 043/64. The study design was an observational retrospective study. Also, informed consent was used routinely before the operation. Flowchart 1 depicts the procedure consisting of ovarian cystectomy, SO, hysterectomy, bilateral pelvic nodes dissection (BPND) and partial omentectomy, depending on the diagnosis. In addition, the patients have given prophylaxis antibiotics (Cefazolin 1,000 mg) intravenously 15 minutes before skin incision. The umbilicus was cleaned, and the bladder was drained using Foleys' catheterization. The laparoscopic procedures were undertaken by general endotracheal anesthesia (GA) followed by lithotomy. Likewise, a uterine manipulator was inserted to afford exposure to the uterus and both adnexae. Afterward, an antiemetic agent was prescribed to all patients for nausea postoperatively.

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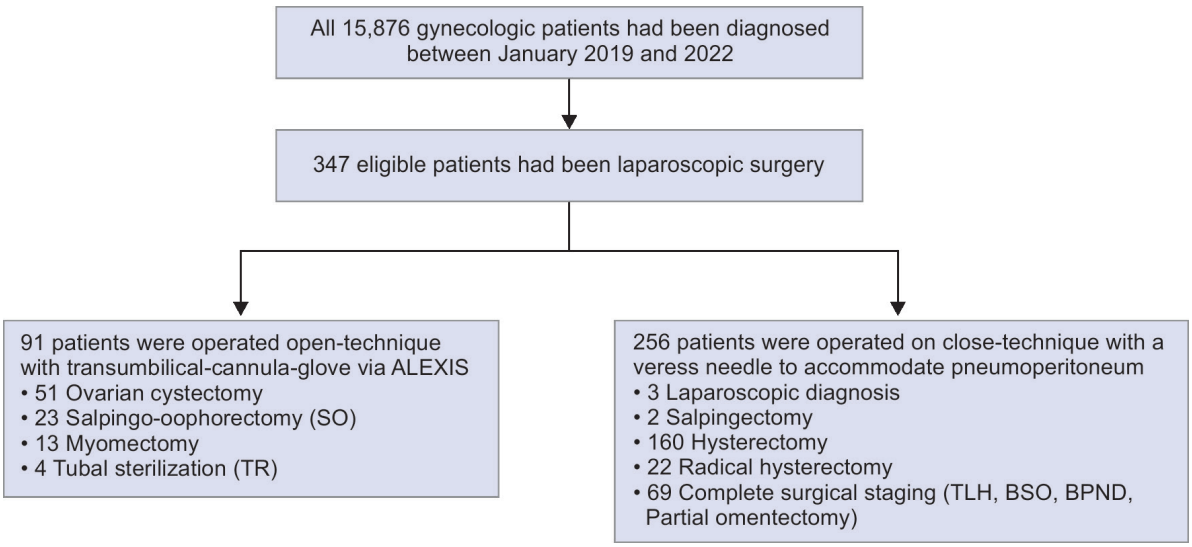
Flowchart 1: The flowchart of the eligible patients



There were two methods to create the pneumoperitoneum in the first laparoscopy step, a closed technique and an open technique. A 1.2-cm vertical skin incision at the umbilicus was used in the closed technique. Moreover, a pneumoperitoneum was created using a veress needle. Finally, a 12-mm trocar was placed through the umbilicus followed by a 10-mm 0°-laparoscope. Two 5-mm trocars were placed under direct vision at the level of the lower abdominal quadrants, which is lateral to the rectus abdominis muscles. Another 5-mm cannula was inserted about 10-cm parallel to the left lower quadrant trocar. In the open technique, the skin was incised at the umbilicus approximately 2.5-cm. Then, the wound retractor (Alexis®) was inserted through the peritoneum into the abdominal cavity. A 12-mm trocar was prepared at the middle finger of a surgical glove to accommodate the 10-mm 0°-laparoscope, as shown in Figure 1. Three 5-mm trocars were placed in the abdominal cavity, similar to the closed technique design. However, 345 patients were in Trendelenburg position except for two pregnant patients with ovarian neoplasm. Two pregnant were neutral lithotomy during the operation. The uterus and both adnexae were identified and dissected step-by-step manner, owing to the operative design. The specimens underwent transvaginal removal after the colpotomy in the hysterectomy procedure. Afterward, a handmade cylinder glove with gauzes was inserted transvaginally. As shown in Figure 2, the glove with gauzes process was a handmade cylinder to maintain the pneumoperitoneum. Total laparoscopic hysterectomy (TLH) is suturing the vaginal vault laparoscopically by barbed suture No. 0 (1,030 baht). Also, the free of charge polyglactin-910 absorbable sutures No.1–0 were sutured at the vagina. Henceforth, the barbed suture is a wound closure device and innovative technology that closes wounds securely without tying knots (V-Loc™). However, the International Federation of Gynecology and Obstetrics (FIGO) determines the FIGO staging systems. The complete surgical staging was performed to diagnose the endometrium and ovarian cancer, consisting of TLH, Bilateral salpingo-oophorectomy (BSO), BPND, and partial omentectomy. In addition, peritoneal washing (PW) was performed to diagnose ovarian cancer. The radical hysterectomy with BPND had been operated on to diagnose cervical cancer.

In the adnexal surgery, on the other hand, the specimens were removed *via* a sterile–plastic bag trans-umbilicus. Hence, the specimen was placed inside a sterile–plastic bag under direct visualization. The tail thread of a sterile–plastic bag was outside the abdominal cavity to close the bag (Figure 3). The physician cut the finger of the glove to withdraw the bag and then pulled out the specimen-containing bag from the umbilical wound. Likewise, adnexal surgery included salpingectomy, SO, and ovarian cystectomy. Finally, the specimens were sent to a pathologist. All patients had no complications postoperatively.

Results

Three hundred and forty-seven patients were operated on laparoscopy. The mean age was 44.89 ± 14.627, and the mean BMI was 22.68 ± 1.94 kg/m^2. The mean blood loss and operative time were 89.26 ± 126.87 mL and 107.57 ± 26.07 minutes, respectively. The five most frequent diseases were leiomyoma in 83 patients (23.9%), endometrial carcinoma in 48 patients (13.8%), serous cystedenoma in 45 patients (13%), endometrioma in 33 patients (9.5%), and cervical carcinoma in 28 patients (8.1%). One hundred sixty patients (46.1%) had undergone a hysterectomy. However, 69 patients (19.9%) had undergone complete surgical staging to diagnose ovarian and endometrial cancer, the remaining one patient was tuberculosis peritoneum. Fifty-one patients had undergone ovarian cystectomy (14.7%). The number of patients with SO, radical hysterectomy, and myomectomy were 23 (6.6%), 22 (6.3%), and 13 (3.7%), respectively. As shown in Flowchart 1 and Table 1, four patients were tubal sterilized. Likewise, two patients had salpingectomies and three remaining laparoscopic diagnoses with tissue biopsy. Nowadays, all gynecological cancer patients have no recurrence. The cervical cancer patients were in 27 early stages, and one patient was in the advanced stage of pelvic node metastasis. The histopathology showed 18 squamous cell carcinomas, seven adenocarcinomas, two adenosquamous carcinomas, and one neuroendocrine. Mostly, histopathology grading was 16 well differentiated, 7 moderately differentiated, and five poorly differentiated. The endometrial cancer patients were 48 endometrioid carcinomas; among these, 40 patients were well-differentiated, 5 patients were moderately differentiated, and 3 patients were poorly differentiated. Thirty-eight patients were in early-stage endometrial cancer, and 10 patients were in stages II–IIIC1. In epithelial ovarian cancer, 18 were serous

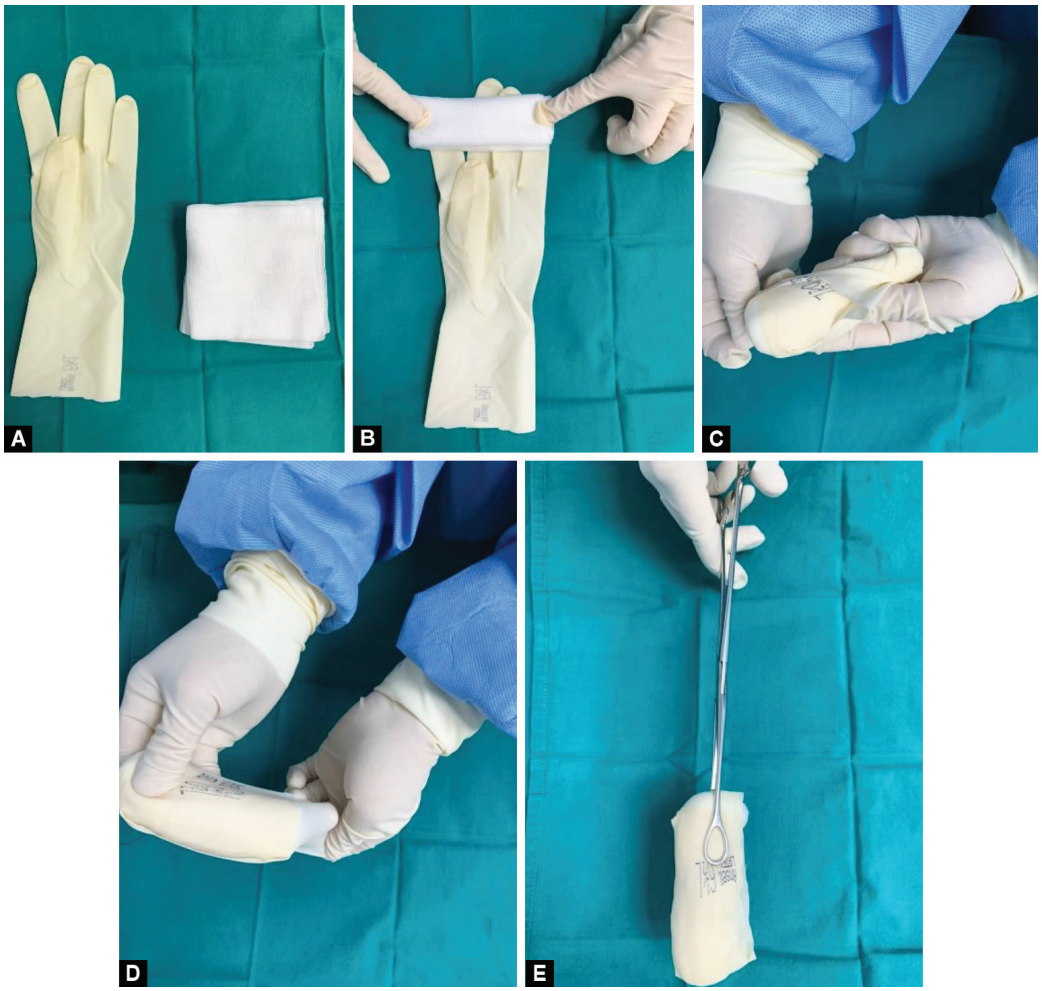
Figs 1A to J: The surgical glove with a 12-mm cannula port had applied with a wound retractor (Alexis®)

cystadenocarcinoma, and 2 were mucinous cystadenocarcinoma. Nevertheless, 16 patients were in stages IA–IB, and two patients were in stage IC1 by surgical spillage intraoperatively. Also, two patients were in stage IIIC1 as pelvic node metastasis. All specimens were removed by retrieval bag, as shown in Figure 2.

Two pregnant patients of 14 and 16 weeks of gestational age were diagnosed with a unilateral endometriotic cyst of approximately 6 and 8 cm at the age of 14- and 20-years-old, respectively. The patients were of ovarian cystectomy with the open technique of laparoscopy approach without complication.

Discussion

This study aims to observe the advantage of the surgical glove in various gynecologic laparoscopic surgery. Hysterectomy is the most frequent gynecological surgical procedure worldwide. The hysterectomy has been performed in benign conditions, approximately 90%.[1] Also, laparoscopic surgery has operated on malignant conditions.[2–6] In this study, the operative time was less than 180 minutes, and the blood loss was less than 1,000 mL. The primary outcomes return to normal activities, satisfaction, and quality of life. Also, intraoperative visceral injury included bladder, ureter, bowel, and vascular injury, the patients had no adverse events intraoperative and postoperatively. Laparoscopic hysterectomy significantly morbidity in cases more than 240 minutes.[2] Notably, laparoscopic surgery had the complete surgery within 180 minutes in all operations. In the open technique of minimally invasive, the adnexal mass can be extracted from the abdominal cavity *via* the umbilicus within the endo-bag.[3] The variety of surgery designs proceed the handmade glove with a trocar, a cylinder-glove with gauzes, and a sterile–plastic bag, as shown in Figures 1 to 3. The minimally invasive surgery is free of charge in the Tertiary Care Center, Buddhachinaraj Hospital, Phitsanulok, Thailand owing to



Figs 2A to E: The glove with gauzes cylinder was handmade creation

Fig. 3: The sterile–plastic bag with a tailed thread was prepared

reimbursement from the public health ministry. Transumbilicus removal of the adnexal mass reduced postoperative pain, avoided vessel injury, allowing faster healing.[3]

In the gynecologic cancer reports, the minimally invasive surgery was operated in endometrial cancer, early-stage cervical cancer, and also an early stage of ovarian cancer.[4–8] This study reviewed the patients with 28 cervical cancer, 48 endometrial cancer, and 20 epithelial ovarian cancer who had operated in minimally invasive surgery (MIS) between 2019 and 2022. All gynecological cancer patients have no recurrence nowadays. In benign ovarian cysts such as endometriotic and dermoid cysts, the mass had been retrieved with a plastic bag. To the review of laparoscopic in pregnant women, laparoscopy is a safe and effective procedure when compared with traditional surgery.[9,10] Also, the leiomyoma which has been myomectomy, the mass had morcellation in a plastic bag when removed the specimens were through the port. The reviews showed in bag morcellation is safe.[11] Although a 14-year old, 16 weeks of gestational age had 8 cm of left endometrioma and underwent laparoscopic left ovarian cystectomy, the operation time was 60 minutes. In addition, a 28-year-old, 14 + 3 weeks of gestational age had a 9 cm left ovarian cyst and underwent left SO, the operation time was 80 minutes. Insufflation at 10 mm Hg was used, and the blood losses were 50 and 10 mL, respectively. Two patients were uneventful postoperatively. Laparoscopic surgery is feasible and safe during pregnancy.[12,13]

The strength of this study showed the benefit of the surgical glove in various operation techniques for benign and malignant gynecologic patients. Despite the retrospective study is limited data on unaccomplished. The additional information regarding

Table 1: Characteristics of the patients

Demographic data	*N = 347*
Age (years), mean ± SD	44.89 ± 14.627
BMI (kg/m^2), mean ± SD	22.68 ± 1.94
Estimated blood loss (mL), mean ± SD	89.26 ± 126.87
Operative time (min), mean ± SD	107.57 ± 26.07
Diagnosis, n (%)	
Leiomyoma	83 (23.9%)
Adenomyosis	19 (5.5%)
Mature teratoma	5 (1.4%)
Endometrioma	33 (9.5%)
Serous cystadenoma	45 (13%)
Mucinous cystadenoma	1 (0.3%)
Endometrial carcinoma	48 (13.8%)
Cervical carcinoma	28 (8.1%)
Epithelial ovarian carcinoma (EOC)	20 (5.8%)
Breast cancer (CA breast)	10 (2.9%)
Delayed development	17 (4.9%)
Ectopic pregnancy	2 (0.6%)
Complete family	4 (1.2%)
Preinvasive of cervix	19 (5.5%)
Endometrial hyperplasia	3 (0.9%)
Endometrial intrepithelial neoplasia (EIN)	3 (0.9%)
Endometrial lesion	5 (1.4%)
Peritoneal tuberculosis (TB)	1 (0.3%)
Pelvic endometriosis	1 (0.3%)
Surgery, n (%)	
Laparoscopic diagnosis	3 (0.9%)
Salpingectomy	2 (0.6%)
Cystectomy	51 (14.7%)
Salpingo-oophorectomy (SO)	23 (6.6%)
Myomectomy	13 (3.7%)
Hysterectomy	160 (46.1%)
Radical hysterectomy	22 (6.3%)
Complete surgical staging	69 (19.9%)
Tubal sterilization	4 (1.2%)

the surgical method compared with the elucidated treatment is provided for future research.

Conclusions

Laparoscopy is feasible and safe for gynecologic diseases. The gynecologic laparoscopic techniques must be skilled in advanced surgery at the practice training center in benign and malignant diseases.

Clinical Significance

A surgical glove is profitable, safe, and effective in gynecologic laparoscopy.

Research involving Human Participants and/or Animals

A retrospective review of medical records was approved by the IRB at Buddhachinaraj Hospital, Phitsanulok (IRB No. 043/64). The procedure performed in this case involving human participants was following the ethical standards of the institutional and/or national research committee and with the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards.

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