Major complication of Gynaecological Laparoscopy in Police General Hospital: A 4-Year Experience

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Objective: *To determine the major-complication rate of gynecological laparoscopy in Police General Hospital.*
Material and Method: *A retrospective and descriptive analysis of medical records from 423 women who underwent gynecological laparoscopy in Police General Hospital was conducted.*
Results: *Four hundred twenty three women were recruited between January 2007 and December 2010. One-third of subjects had history of previous gynecological surgery. Major complication rate was 2.84% (12/423). Urinary bladder, ureter, bowel, and vesico-vaginal fistula injury were 0.95% (4), 0.71% (3), 0.95% (4), and 0.23% (1), respectively. The conversion rate to exploratory laparotomy was 4.7% (20). There was no death in subject who had serious complication in this study. The operative time trended to decline in minor operation but not changed in major and advanced operation. Two-third of major complication was intraoperative diagnosed and repaired.*
Conclusion: *The major complication rate was 2.84%. The urologic and bowel injury are the common complications.*

Keywords: *Complication, Gynecological laparoscopy*

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Laparoscopic surgery has been developed over the past 20 years. It has been well accepted worldwide as a treatment for many gynecological and infertility problems. During the past decade, laparoscopic surgery was shown to have a high benefit for many reasons, for the cosmetic purpose, lesser the postoperative pain, intraoperative blood loss, intraabdominal adhesion, and shorter recovery period compared to conventional surgery[1]. However, laparoscopic studies in many gynecological publications showed different complication rates, depending on the type of complicated operative procedures.

Laparoscopic surgery in gynecology was introduced in Thailand in 1995. It was introduced to Police General Hospital in Bangkok, Thailand in 2007. Complications were found to be of similar types as reported in studies worldwide[2]. These studies reported different complication rates, depending on the complicated operative procedure.

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The present study retrospective was performed to collect the information on laparoscopic gynecological complications in Police General Hospital between January 2007 and December 2010. The purpose of the present study was to report complications found in laparoscopic procedures, and discuss possible ways of further reduction of complication.

Material and Method

The present study retrospective was based on review of medical records in Police General Hospital, Bangkok between January 2007 and December 2010. The present study was approved by Police General Hospital Administration Ethics committee for research involving human subjects. The medical records of 423 subjects who underwent gynecological laparoscopy in Police General Hospital during the period were reviewed and analyzed. The collected data composed of demographic data, medical data, operative data, complications and treatment, and postoperative assessment. Four gynecologists performed these procedures under random assignment. All cases were supervised by expert gynecological laparoscopists with more than 10 years experience.

All operative procedures were performed using standard techniques. The closed technique for abdominal entry (trocar insertion after pneumoperitoneum creation) was used in all cases. After recovery from operation, all patients were discharged when their conditions were uneventful. All cases were followed up at least six weeks after surgery. If complications occurred then additional follow-up was performed and the result followed. Evaluation of operational complication was performed at six months postoperation.

Operational definitions

Gynecological Laparoscopy is composed of many different operations where the laparoscope is used as an aid to gynecological surgery, for example hysterectomy, adnexectomy, adhesiolysis, and diagnostic purpose. The closed technique of laparoscopy is performed by trocar insertion after pneumoperitoneum creation by gas insufflation via Veress needle.

Major complication is used when there is major organ injury resulting from gynecological laparoscopy *i.e.* procedure involving great vessels, urological, and intestinal injury.

LAVH (laparoscopic assisted vaginal hysterectomy) refers to vaginal hysterectomy after laparoscopic sacrificed of the upper uterine ligaments (*e.g.* round, infundibulopelvic or uteroovarian ligaments) with bipolar desiccation and cut by endoscopic scissors. Four ports technique was performed in the present study.

TLH (total laparoscopic hysterectomy) refers to that the laparoscopic dissection and cutting of uterus using bipolar dissector and endoscopic scissors. When the uterus is free of all attachments in the peritoneal cavity then it is removed through the vagina, with morcellation if necessary. The vaginal stump is then sutured via laparoscope. Four ports technique was also performed.

Major operative laparoscopy denotes LAVH, TLH and myomectomy.

Advanced operative laparoscopy denotes ovarian cystectomy, salpingectomy, oophorectomy, salpingo-oophorectomy.

Minor operative laparoscopy refers to minor procedure such as tubal ligation, electric cauterization, and adhesiolysis.

Descriptive statistics for data analysis used use SPSS version 15.

Results

Table 1 shows the medical history of participating subjects. Four hundred twenty three subjects who underwent laparoscopic gynecological surgery in Police General Hospital were included in the present study. The average age of patients was 38 years (range 12 to 69 years) with average BMI was 22.14 kg/m^2 (range 10.95 to 44.62 kg/m^2). Forty-five percent of patients had at least one child. Twenty-eight percent of the subjects had underlying disease namely hypertension, diabetes mellitus and thyroid disease at 7.1, 1.9, and 0.9%, respectively. Thirty-two percent had previous abdominal surgery namely appendectomy, caesarian section, laparotomy at 14.66, 8.27, and 4.73%, respectively. The majority of the subjects were diagnosed with benign uterine mass (myoma uteri and adenomyosis) and endometriotic cyst at 41.1 and 26.5%, respectively (Table 2).

Table 2 shows indication and main procedure at gynecological laparoscopic cases. Myoma uteri and adenomyosis were major finding at 41%. Endometriotic cyst, other ovarian cysts, and tubal pregnancy were found at 26.5, 10.9, and 5.7%, respectively. Diagnostic laparoscopy, minor, major and advanced operation were 1.4, 10.4, 44.7, and 38.8%, respectively. The average uterine weight was 247g (range 85 to 1,342 g) in laparoscopic hysterectomy cases. Overall blood loss was average 184 ml (range 50 to 2,000 ml). TLH and LAVH were 31%. The postoperative hospital stay was three days in average (Table 1).

Average operative time data is shown in Table 3. Average operational time was presented as an average per each type of procedure in each executive year (Fig. 1).

Table 4 shows rate of individual type of complication. In the present study, overall laparoscopic complications were 8.98%. The major complication rate was 2.84%, whereas urologic injury (1.66%) was

Table 1. Medical history of participating cases at Police General Hospital (January 2007 to December 2010)

Data	Total (n = 423)	Range
Age (yr)	38.38 ± 8.95	12-69
BMI (kg/m^2)	22.14 ± 4.35	10.95-44.62
Underlying disease*	27.7%	-
Previous abdominal surgery	32.4%	-
Uterine weight (g)	246.74 ± 155.03	85-1,342
EBL (ml)	183.67 ± 185.45	50-2,000
Hospital stay (day)	3.20 ± 1.9	1-16

Data present as mean ± SD
BMI = body mass index; EBL = estimate blood loss
* Hypertension, diabetes mellitus, and thyroid disease

Table 2. Indication and main procedure of gynaecological laparoscopic cases at Police General Hospital (January 2007 to December 2010) (n = 423)

Data	No. (%)
Indication*	
Myoma uteri & adenomyosis	174 (41.1)
Endometriotic cysts	112 (26.5)
Other ovarian cyst	46 (10.9)
Tubal pregnancy	24 (5.7)
Others	67 (15.8)
Main procedure	
Diagnostic laparoscopy	6 (1.4)
Minor operative laparoscopy	44 (10.4)
Major operative laparoscopy	
Ovarian cystectomy	115 (27.2)
Salpingectomy, oophorectomy, salpingo-oophorectomy	74 (17.5)
Advanced operative laparoscopy	
LAVH	101 (23.9)
TLH	30 (7.1)
Myomectomy	33 (7.8)
Conversion to open abdominal surgery	20 (4.7)

* Pathological diagnosis
** Dermoid cyst, serous cystadenoma, mucinous cystadenoma and ruptured corpus luteal cyst
LAVH = laparoscopic assisted vaginal hysterectomy; TLH = total laparoscopic hysterectomy

found in most cases. The injury of urinary bladder and urethra were 0.95 and 0.71%, respectively. There was only one case of vesico-vaginal fistula at 0.23%. The percentage of bowel injury was 0.95%.

Minor complication rate was 6.14%. The percentage of blood transfusion, port site infection, vaginal stump infection, and bleeding were 3.55, 1.65, 0.71, and 0.23%, respectively.

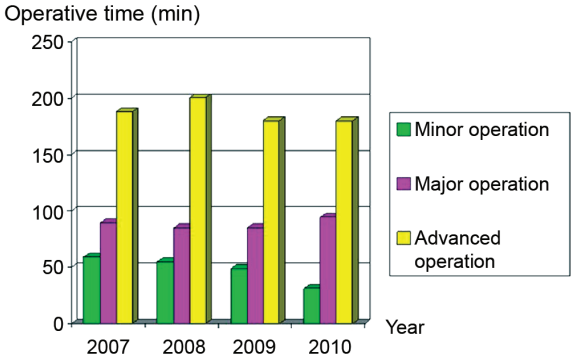

Fig. 1 Time spent in gynaecological laparoscopy operation

Most of the major complications were found intraoperatively in advanced operative laparoscopy. Half of them were repaired by laparoscopic suturing technique. All the injury urinary bladder site located at dome of the urinary bladder. Three cases of urinary bladder injuries were intraoperative detected and only one case was postoperative detected (seventh day). All of them were the LAVH cases. The late detected urinary bladder injury case was repaired via exploratory laparotomy. The intraoperative detected cases were repaired via laparoscopy (2 cases) and transvaginal approach (1 case).

All three ureteric injury cases were found at the distal part of the ureter. All of them were LAVH cases. Only one case was detected during the operation and ureterocystostomy was performed for correction. While two cases caused by thermal burn were postoperative detected at the third and eighth day and eighth week of operation. Double J stent placing was retained until six and seven months, respectively.

All bowel injuries were found intraoperatively. There were two large bowel injury cases. The first case was serosal tear of rectum at the middle part. It was caused by needle injury. Another case was perforated of transverse colon injury caused by Veress needle puncture during gas insufflation step. The immediate primary suture was performed via exploratory laparotomy in one subject. Laparotomy repair with loop transverse colostomy was performed in another subject (close colostomy was done four months later).

Small bowel was torn at serosa and sutured by laparoscopy. Two occurred in ovarian cystectomy and repaired by laparotomy. Laparoscopic suture was done for another subjects.

Nevertheless, vesico-vaginal fistula was found in one case. The detection was the seventeenth day after operation. The fistulectomy was the repair procedure in the fourth month after LAVH procedure as Table 3. Overall rate of conversion to exploratory laparotomy was 4.7% (20 cases). Rate of complication in our institution between 2007 and 2010 was shown in Table 3. It is significantly reduced from the 4.1% in 2008 (year one of technique introduction) to 1.3% in 2010.

Table 5 shows information from laparoscopic surgery in gynecology reports in Thailand. Our time spent in each case is within the range of other institutes. Length of stay and blood loss show no significant difference from reports from other local institutes.

Table 3. Time spent in gynaecological laparoscopy operation

	2007		2008		2009		2010	
	n	Time (min*)	n	Time (min*)	n	Time (min*)	n	Time (min*)
Minor**	22	63.1 ± 36.0	7	53.4 ± 28.9	15	48.7 ± 21.1	6	36.8 ± 15.2
Major	53	88.1 ± 39.8	62	88.4 ± 55.6	31	84.6 ± 26.2	43	99.5 ± 41.2
Advanced***	45	188.1 ± 72.5	54	197.8 ± 62.2	53	180.1 ± 57.4	32	176.5 ± 64.6

* Mean ± SD
** Included diagnostic laparoscopy
*** Included cases conversion to abdominal surgery

Table 4. The rate of individual types of complication

	No. (%)	Operation			Detection		Repair	
		Minor	Major	Advanced	Intraop	Postop	Open***	Others
Major complication	12 (2.84)	-	2	10	8	4	6	6
Bladder injury	4 (0.95)	-	-	4	3	1	2	2
Ureteric injury	3 (0.71)	-	-	3	1	2	1	2*
Bowel injury	4 (0.95)	-	2	2	4	-	3	1
Rectum	1 (0.23)	-	1	1	1	-	1	-
Transverse colon	1 (0.23)	-	-	1	1	-	1	-
Small bowel	2 (0.47)	-	2	-	2	-	1	1
Vesico-vaginal fistula	1 (0.23)	-	-	1	-	1	-	1**
Minor complication	26 (6.14)	-	6	20	15	11	-	-
Blood transfusion	15 (3.55)	-	1	14	15	-	-	-
Port site infection	7 (1.65)	-	5	2	-	7	-	-
Vaginal stump infection	3 (0.71)	-	-	3	-	3	-	-
Vaginal stump bleeding	1 (0.23)	-	-	1	-	1	-	-

* Double J stent insertion
** Fistulectomy
*** Open laparotomy

Table 5. The laparocopic surgery in gynecology reports in Thailand

Study year	2004[8]	2007[9]	2008[10]	2009[11]	2011[12]	2012[13]	Present
Province	Nonthaburi	Uttaradit	Bangkok	Bangkok	Suphanburi	Bangkok	Bangkok
Surgery	LAVH	LAVH	TLH	TLH	TLH	TLH	LAVH/TLH
Cases (No.)	26	50	125	75	30	115	101/30
Time (min)	147.1 ± 19.8	115.9 ± 40.8	267.8 ± 74.4	299.6 ± 31.8	218.4 ± 79.3	185.1 ± 48.7	192.6 ± 61.5
LOS (day)	3.0 ± 0.95	2.6 ± 0.9	3.9 ± 2.0	3.1 ± 1.0	3.2 ± 1.1	3.5 ± 1.1	3.2 ± 1.9
Blood loss (ml)	369.2 ± 57.0	164.0 ± 153.7	302.7 ± 287.3	270.1 ± 27.1	389.9 ± 125.4	302.6 ± 255.1	307.9 ± 262.0
Complication No. (%)							
Serious	1 (3.8)	6 (12.0)	1 (0.8)	5 (8.5)	18 (30.0)	21 (18.3)	10 (7.6)
Bladder injury	1 (3.8)	1 (2.0)	1 (0.8)	1 (1.3)	1 (3.3)	1 (0.9)	4 (3.1)
Ureteric					2 (6.7)		3 (2.3)
Bowel					2 (6.7)		2 (1.5)
V-V fistula							1 (0.8)
Conversion rate	0	N/A	6 (4.8)	0	0	5 (4.3)	20 (15.3)

LOS = length of stay

Discussion

Laparoscopic surgery in gynecology has been introduced at Police General Hospital in Bangkok, Thailand in 2007. Complications were similar types as reported in studies worldwide, namely urinary bladder injury, ureteric injury, bowel injury, and vesico-vaginal fistula[2,3]. These studies reported different complication rates, depending on the complicated operative procedure.

In the present study, complication rate was 8.98%. In the literature[2-4]. The overall complication ranged from 0.4 to 0.57%. The present study had a higher complication rate than literature reports. Serious complication range is between 0.8 and 18.3%. Our report of 7.6% of serious complication is the low incidence. The incidence of bladder complication in this report is 3.1%. It is within the range with other reports. Our complication in ureteric and bowel injuries is lower than other reports, at 2.3% and 1.5% compared to 6.7% in both injuries from Suphanburi

Our urinary bladder injury rate was 0.95%, mostly found in LAVH case. The urinary bladder injury occurred during dissection urinary bladder from anterior surface of uterus. The common site of injury was dome of urinary bladder especially in previous cesarean section[5].

The presented ureteric injury was found in 0.71% of the cases. Review of gynecological laparoscopic surgery in the US found ureteric injury in 1 to 2% while US and China reported between 0.03 and 0.13%[5,6]. Our cases of ureteric complication depended on the difficulty of operation like that reported by Ostrzenski (2003)[6]. Most of the injuries were caused by incidental cut from electric cautery. The ureteric injury was found around day 6 postoperative in 79% of our subjects[6].

The bowel injury was 0.95% in the present study comparing to 0.33% in the literature[7]. The injury of bowel usually occurred during adhesiolysis and Veress needle puncture. All four cases of our bowel injury cases were intraoperative diagnosed. Two cases of rectal injury were repaired via laparoscopy and laparotomy. One case of transverse colon injury was repaired by exploratory laparotomy repairing. One case of small bowel injury was laparoscopic repaired.

Conclusion

There were 423 subjects in the present study, which focused on major complications of laparoscopic gynecological surgeries in Police General Hospital between January 1, 2007 and December 31, 2010. The major complication rate was 2.84% (12/423). Most of the major complications were urologic (1.66%) and bowel injuries (0.95%). The minor complication rate in the present study was 6.15%. The most common was blood transfusion.

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Potential conflicts of interest

None.

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ภาวะแทรกซ้อนรุนแรงของการผ่าตัดส่องกล้องทางนรีเวชในโรงพยาบาลตำรวจ: ประสบการณ์ 4 ปี

เสรี ธีรพงษ์, พรรณอร รุ่งอร่ามศิลป์, ชำนาญ แท่นประเสริฐกุล, กรณ์กาญจน์ ภมรประวัติธนะ, คมสันติ์ สุวรรณฤกษ์

วัตถุประสงค์: *ศึกษาภาวะแทรกซ้อนรุนแรงของการผ่าตัดส่องกล้องทางนรีเวชในโรงพยาบาลตำรวจ*
รูปแบบการศึกษา: *การศึกษาเชิงพรรณนาย้อนหลัง*
วัสดุและวิธีการ: *เก็บข้อมูลย้อนหลังของสตรีที่ได้รับการผ่าตัดส่องกล้องทางนรีเวชของโรงพยาบาลตำรวจ จำนวน 423 ราย*
ผลการศึกษา: *สตรีจำนวน 423 ราย ที่รับการผ่าตัดส่องกล้องทางนรีเวช ระหว่างเดือนมกราคม พ.ศ. 2550 ถึง เดือนธันวาคม พ.ศ. 2553 พบว่าหนึ่งในสามของสตรีมีประวัติการผ่าตัดทางนรีเวช อัตราการเกิดภาวะแทรกซ้อนรุนแรงโดยรวม ร้อยละ 2.84 (12/423) แยกเป็นการบาดเจ็บต่อกระเพาะปัสสาวะ ท่อไต ลำไส้ และการเกิดรูรั่วระหว่างกระเพาะปัสสาวะและช่องคลอด คิดเป็นร้อยละ 0.95 (4/423), 0.71 (3/423), 0.95 (4/423) และ 0.23 (1/423) ตามลำดับ อัตราการเปลี่ยนจากการส่องกล้องเป็นการผ่าตัดเปิดหน้าท้องคิดเป็นร้อยละ 4.7 (20/423) ไม่พบผู้ป่วยเสียชีวิตในการศึกษา เวลาการผ่าตัดมีแนวโน้มลดลงในกรณีการผ่าตัดเล็ก และไม่เปลี่ยนแปลงในกรณีการผ่าตัดใหญ่ สองในสามของผู้ป่วยที่มีภาวะแทรกซ้อนรุนแรงสามารถวินิจฉัยได้ในขณะทำผ่าตัด*
สรุป: *ภาวะแทรกซ้อนที่รุนแรงพบในอัตราร้อยละ 2.84 การบาดเจ็บต่อระบบทางเดินปัสสาวะและลำไส้เป็นภาวะแทรกซ้อนที่พบได้บ่อย*