

# Minilaparotomy Hysterectomy in the Management of Benign Gynecologic Diseases

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## Abstract

Considering the advantages of minimally invasive surgery, an attempt to explore less invasive trans-abdominal incisions could represent an alternative to laparoscopic gynecologic surgery. The aim of this prospective descriptive study was to assess the feasibility and clinical outcomes of minilaparotomy hysterectomy in a consecutive series of patients. Data were collected on all patients who underwent hysterectomy by means of minilaparotomy in Nopparat Rajathanee Hospital from January 1 to May 31, 2009. Minilaparotomy was defined as a skin incision  $\leq 6$  cm in length.

During the study, a total of 65 hysterectomies were performed. Twenty of those cases were performed by means of minilaparotomy hysterectomy. The mean age of the patients was 44.35 years. The mean operative time was 89 minutes (range 60-120). No intraoperative complications or perioperative blood transfusions were reported. Mean days of Foley catheter removal and mean days of ambulation, regular diet, and discharge were 1 day, 1.2 days, 2 days and 3 days respectively. No severe early post-operative morbidity was observed.

The results showed that minilaparotomy hysterectomy was safe and feasible surgical approach in women undergoing hysterectomy for benign gynecological diseases. Because of the emerging good outcome, it should be considered as a valid alternative to the conventional abdominal hysterectomy.

**Key words:** minilaparotomy, hysterectomy, benign gynecologic diseases

## Introduction

Hysterectomy is the most common gynecologic surgery performed for benign conditions worldwide, most of which were done through large abdominal incisions. More recently, operative gynecological endoscopy has disclosed new attractive horizons of minimally invasive surgery, offering both surgeons and

patients excellent advantages in terms of intra- and postoperative results. Patients undergoing operative laparoscopy have shown good surgical outcomes, shorter hospitalization, less-painful postoperative recovery time and an improved quality of life as compared to open surgery.<sup>(1,2)</sup>

However, laparoscopy has some limits, such as

the induction of pneumoperitoneum which can cause serious intra-operative complications in patients with severe obesity or with critical physical status<sup>(3)</sup>. It also needs extensive training and expensive equipments.<sup>(4,5)</sup>

Use of minilaparotomy in surgery for benign gynecologic diseases has been well established with encouraging results.<sup>(6)</sup> Hoffman et al<sup>(3)</sup> reporting good results as safe and effective in term of operative time, cost, intra and post-operative complications and discharge. Benedetti Panici et al<sup>(6,7)</sup> also have used minilaparotomy successfully in benign gynecologic diseases and hysterectomy.

In Nopparat Rajathanee Hospital, 90 percent of hysterectomies were performed through abdominal incisions more than 6 cm in length. The remaining 10 percent were performed trans-vaginally or laparoscopically. Minilaparotomies were originally used in some gynecologic operations, such as sterilization and ectopic pregnancy. Minilaparotomy hysterectomy, however, has never been explored. The principle of the technique was to move a particular operated tissue toward the restricted surgical incision rather than to retract widely opened incision to see the whole operated organ like in traditional abdominal hysterectomy. There is a need to know whether minilaparotomy hysterectomy is safe and cost effective in contrast to standard abdominal hysterectomy. The aim of this study was to evaluate experiences with minilaparotomy hysterectomy, analyzing feasibility and outcome of minilaparotomy hysterectomy in a consecutive series of patients.

### **Methodology**

This study was prospectively conducted on 20 patients undergoing surgery by minilaparotomy hysterectomy in Nopparat Rajathanee Hospital from January to May 31, 2009. The indications for hysterectomy were: myomas with abnormal uterine bleeding, myomas with the presence of adnexal mass, enlarg-

ing uterus with myoma (asymptomatic myoma).

Data concerning the patients were obtained from medical records and analyzed to represent the end point of this paper. Age of patients, body mass index (BMI), concomitant systemic diseases, parity, length of incision, operative time, uterine weight, estimated blood loss, duration of postoperative ileus, intra and post-operative complications, postoperative hospitalization were all considered.

Operative complications were defined as bowel, bladder, ureteral or vascular injuries and estimated blood loss exceeding 500 ml. Early post-operative complications were defined as any adverse events that occurred within 30 days of surgery and considered severe if they resulted in unplanned admission, blood transfusion, or secondary surgical procedure. Anemia was considered in the case of hemoglobin levels lower than 8 g/dl and fever in the case of body temperature at least 38°C in two consecutive measurements at least 6 hr apart, excluding the first day after surgery.

Inclusion criteria were any patient requiring hysterectomy with mobile uterus regardless of the uterine size. The presence of fixed uterus due to severe pelvic endometriosis or dense pelvic adhesions was always evaluated before patient enrollment. A body mass index (BMI) higher than 32, the presence of large sized adnexal mass were considered relative contraindications to minilaparotomy.

The patients were counseled regarding the potential need to enlarge the incision in case of technical difficulties. Written informed consents were taken from all the patients and the departmental ethical committee approved the study.

All patients received complete bowel preparation and antibiotics prophylaxis (cefazolin 1 gm iv.) A minilaparotomy hysterectomy was performed in all cases. Minilaparotomy was defined as a transverse skin incision about the pubic hair line <6 cm long.

General anesthesia was used in all patients.

The Foley catheter (no. 16 Fr) was removed on the first day morning following surgery. Analgesics (pethidine) were given on the first 24 hours, depending on the patients' call. Patients were encouraged to start oral fluid from the next morning when bowel sound appeared. Discharge criteria were the following: no fever, tolerance to semi-solid diet, ability to ambulate, spontaneous micturition and pain controlled with oral medication.

### **Surgical technique**

The position of the patient was adjusted according to the size of the uterus. In case the uterus was expected to be delivered through the abdominal incision without morcellation, the patient was placed in Trendelenburg position. If the uterus was exceedingly large relative to the abdominal incision, in which case the process of hysterectomy must be performed entirely intra-abdominally and morcellation was needed, the patient was placed in Trendelenburg low lithotomy position. Bladder catheterization was done. The uterine manipulator was applied in case of large uterus or relatively small incision in order to mobilize the uterus to facilitate exposure of the adnexa as well as elevation/rotation of the uterus and the uterine attachments. It allowed the procedure to be carried out with the best tissue exposure and a significant reduction in surgical risks. A minilaparotomy Pfannenstiel incision 4-6 cm in length, depending on the thickness and distensibility of the abdominal wall as well as the uterine size, was performed. Subcutaneous fat was separated and rectus fascia opened transversely 1-2 cm larger than the skin incision. The peritoneum was opened vertically. If necessary, the bowel was packed upward with small, warm, wet abdominal swab.

Self-retaining retractor was never used and it was replaced by one or two Richardson and one Deaver retractors. To optimize the intraoperative view with-

out overstretching, the retractors had to be continually moved, thus allowing the operative window to be focused exclusively on the anatomic structure on which the surgeon is working. The surgical technique was basically the same as in laparotomy but the surgeon had to perfect the skill working with the instrument in a vertical position, because their wide inclination was not possible. Moreover, given the small dimension of the operative window, the affected organs were pulled toward or through the abdominal incision. Meticulous and prompt hemostasis by bipolar electro-coagulating forceps allowed the surgeon to keep the operative field bloodless and proceed safely and quickly.

If the patient placed in lithotomy position, after both uterine arteries were transected and uterine manipulator was removed, specially designed vaginal fornices delineator was routinely used. This device was made from thin-walled PVC water pipe of diameter 34 mm. and 20 cm. long. One end of the pipe was semicircularly and obliquely cut to make an angle of 45 degrees. The other end was closed with same-sized cap. A landmark was made at the closed end exactly at the line drawn longitudinally from the midpoint of the non-cut semicircular rim of the opened end.

The opened end of the device was inserted deeply into the vagina, and pushed strongly cephalad from the closed end by the assistant. By pointing the landmark anteriorly, the anterior vaginal fornix was clearly demonstrated and the vagina could be cut precisely at the fornix with pinpoint monopolar cutting current. Both lateral fornices were identified and the vagina was cut after simultaneous rotation of the device. At this stage the device was removed. The vagina at the posterior fornix was clearly visible and elevated into view with the use of Army Navy retractor inserted under the uterosacral ligaments which was then cut with scissors.

By using the device, the vaginal fornices were

easily identified and vaginal length was preserved. The vaginal cuff was closed continuously in two layers by 2-0 Vicryl suture. The second layer incorporated pubocervical fascia and uterosacral - cardinal ligament complex which helped restore the pericervical ring and make good vaginal support.

In case of large-sized uterus, after all uterine pedicles were transected, morcellation by blade or scissors was required to remove the tissue via the incision. A scar measurement was made at the end of surgery, in order to check any possible lengthening due to the traction on the skin.

## Results

From January to May 2009, 65 hysterectomies for benign gynecologic diseases were performed at the Department of Obstetrics and Gynecology, Nopparat Rajathanee Hospital. Out of the 65 cases, twenty of these were performed by minilaparotomy route (30.8 %). Indications for minilaparotomy hysterectomy were: myoma uteri, myoma uteri with endometriotic cyst, adenomyosis, dysfunctional uterine bleeding resistant to medical therapy, and CIN III.

Clinical characteristics of patients who underwent minilaparotomy hysterectomy were shown in table 1. The mean age of the patients was 44.35 years (range 37 - 51) and the mean parity was 1.35 (range 0 - 5). Two had significant medical underlying diseases that was hypertension and diabetes mellitus, which place them in high risk group for the surgery. One patient was moderately obese (BMI 31.7), three had previously undergone pelvic or abdominal surgery (2 prior cesarean section and 1 appendectomy). The intra-operative findings always confirmed the preoperative diagnosis.

Operative and post-operative data were shown in table 2. Eight patients had 6 cm incision, seven patients had 5 cm incision, and the remaining five had 4 cm. The length of the fascial incision was usually

larger than that of the skin incision, although that was not measured (approximately 1-2 cm beyond each corner). Two of the incisions were through a prior scar. General anesthesia was used in all cases. No case had to be converted to conventional large incision. The adnexae were removed with the uterus in 14 cases.

The median operative time was 89 minutes (range 70 - 120). The median uterine weight was 415.5 gm (range 140 - 900), The largest uterus removed using this technique weighed 900 gm and was removed through an 6 cm incision. The estimated median blood

**Table 1** Characteristics of the patients and indications for surgery (n = 20 patients)

		range
Median age (years)	44.35	37-51
Median BMI (kg/m <sup>2</sup> )	24.75	17.3-31.7
Parity (n) median	1.35	0-5
Underlying diseases (%)		
Hypertension	1 (5)	
Diabetes mellitus	1 (5)	

**Table 2** Operative data

		range
Operative time (min)	89	70-120
Uterine weight (gm)	415.5	140-900
Blood loss (ml)	300	100-700
Conversion to laparotomy	0	
Intraoperative complications	0	

**Table 3** Early postoperative outcomes

	days
Foley catheter removal median	1
Ambulation mean	1.2
Regular diet mean	2
Postoperative hospitalization	3

loss was 300 ml (range 100 - 700), none of the patient needed blood transfusion. No patient had intraoperative complications. Minor postoperative complications consisted of fever in one patient (5 %). In all cases bowel function returned to normal within 24 hours, the median bladder drainage was one day. The median postoperative hospitalization was three days. (Table 3)

All patients came to follow up within 1 and 6 weeks after the operation. The outcome of treatment was declared to be good in all cases, and the median number of days it took them to return to normal activity was 20 days.

## Discussion

In the last decade, under the competitive pressure of minimally invasive techniques, laparotomic surgery has been making remarkable improvement<sup>(3,6,8)</sup>. Safety and efficacy of minilaparotomy for benign gynecologic pathology have been validated in various publications<sup>(9,10)</sup>, demonstrating that it is feasible to perform a hysterectomy through a small incision, benefiting the patient with a less invasive surgery and good cosmetic result.

The results of this study have shown that it was possible to improve the quality of abdominal scar and to reduce hospital stay after abdominal hysterectomy by some improvement of surgical techniques. Pre-emptive analgesia, reduction of the incision length and omission of self-retaining retractor by decreasing nociceptive stimuli and abdominal trauma contributed to contain postoperative stay.

Hoffman and Lynch have reported their initial experiences with minilaparotomy hysterectomy: 26 abdominal hysterectomies were carrying out by this route, with a mean operative time of 84 minutes and postoperative stay of 3.4 days<sup>(3)</sup>. Despite the mean length of their incision was not different from this report, but the mean operative time was lesser because

the mean uterine weight was smaller (the biggest uterus weighed 275 gm) and in some cases of this study, more time was spent to apply the uterine manipulator to mobilize the uterus. Moreover, the difference from this study, only 30.8 percent of the abdominal hysterectomies were performed by minilaparotomy. Furthermore, the inclusion criteria of this study did not limit the size of uterus (The largest uterus weighed 900 gm), the BMI of the patients ( BMI of the most obese patient was 31.7), the history of previous surgery like in some studies.<sup>(2,6,9,10)</sup> Even in the learning process, it is believed that the procedural feasibility may be significantly expanded after gaining experience.

According to a universal agreement the vaginal hysterectomy is a gold standard for the definitive treatment of benign uterine conditions, but less than a quarter of hysterectomies were performed by the vaginal route<sup>(11)</sup>. This tendency is probably due to the fact that not all surgeons feel comfortable in performing vaginal hysterectomy.

In many aspects, the surgical techniques of minilaparotomy hysterectomy are similar to the approach of vaginal hysterectomy. Since anatomical accessibility is limited with both techniques, similar criteria for obtaining a good operative window should be performed. So minilaparotomy is an excellent alternative for surgeon who is not expert in vaginal technique and for the institutions that have the limitation for laparoscopic surgery. An experienced gynecologist who wishes to perform a hysterectomy or any gynecologic surgery with the benefits of minimally invasive surgery can use this technique, which is easy to learn and incorporate.

Minilaparotomy hysterectomy is substantially more cost-effective than prolonged laparoscopic hysterectomy. The operative time is apparently shorter than that of laparoscopy performed for similar disease. It is believed that the value of minilaparotomy in gy-

necology, surgical techniques is based fundamentally in four preparatory components

- position
- incision
- retraction
- mobilization

**All are critical to a successful minilaparotomy hysterectomy**

This report gives preliminary observation on a small number of patients. Comparing these data with other hysterectomy routes or drawing conclusions about specific indications would not be appropriate. A preliminary conclusion drawn from this study is that minilaparotomy is a safe and feasible route for hysterectomy for selected group of patients.

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**บทคัดย่อ** การตัดมดลูกทางหน้าท้องผ่านแผลผ่าตัดขนาดเล็กในการรักษาโรคทางนรีเวชที่ไม่ใช่เนื้อร้าย  
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การทำผ่าตัดแผลเล็กมีประโยชน์แก่ผู้ป่วยหลายประการ ดังที่ทราบกันดีในการทำผ่าตัดผ่านกล้อง วัตถุประสงค์ของการศึกษานี้เป็นการศึกษาเชิงพรรณนาเบื้องต้น เพื่อประเมินความเป็นไปได้ในการผ่าตัดมดลูกผ่านแผลผ่าตัดทางหน้าท้องขนาดเล็กไม่เกิน 6 เซนติเมตร (minilaparotomy hysterectomy) โดยทำผ่าตัดในผู้ป่วยที่จำเป็นต้องตัดมดลูกในการรักษาโรคทางนรีเวชที่ไม่ใช่เนื้อร้ายและเข้าอยู่ในเกณฑ์การศึกษา ในโรงพยาบาลนพรัตนราชธานี ตั้งแต่เดือนมกราคมถึงเดือนพฤษภาคม 2552 พบว่ามีผู้ป่วยที่มีความจำเป็นต้องตัดมดลูกทั้งหมด 65 ราย มีผู้ป่วยที่เข้าอยู่ในเกณฑ์การศึกษาและได้รับการผ่าตัด minilaparotomy hysterectomy 20 ราย (30.8%) ได้ผลสำเร็จทุกราย อายุผู้ป่วยเฉลี่ย 44.35 ปี ใช้เวลาในการทำผ่าตัดเฉลี่ย 89 นาที (ตั้งแต่ 60 - 120 นาที) ไม่มีภาวะแทรกซ้อนระหว่างการผ่าตัด ไม่มีผลข้างเคียงให้เลือด สามารถเอาสายสวนปัสสาวะออก ลูกเดิน กินอาหารปรกติ จำหน่ายออกจากโรงพยาบาลได้ เฉลี่ยในวันที่ 1, 1.2, 2, 3 หลังผ่าตัดตามลำดับ ผลการศึกษานี้แสดงว่า minilaparotomy hysterectomy เป็นวิธีการผ่าตัดที่สามารถทำได้ และมีความปลอดภัย เป็นอีกทางเลือกหนึ่งสำหรับการผ่าตัดมดลูกในการรักษาโรคทางนรีเวชที่ไม่ใช่เนื้อร้าย นอกเหนือจากการตัดมดลูกทางหน้าท้องโดยวิธีดั้งเดิม

**คำสำคัญ:** ผ่าตัดแผลเล็ก, ตัดมดลูก, โรคทางนรีเวชที่ไม่ใช่เนื้อร้าย