

รายงานการศึกษาเบื้องต้น เรื่อง การผ่าตัดเฉพาะเนื้องอกมดลูกโดยใช้กล้องส่องช่วย ในผู้ป่วยจำนวน 6 ราย

โกวิท คำพิทักษ์¹, ปภาดา แสนสง², กนก สีจร¹

¹ภาควิชาสูติศาสตร์ และนรีเวชวิทยา คณะแพทยศาสตร์ มหาวิทยาลัยขอนแก่น

²โรงพยาบาลศรีนครินทร์ คณะแพทยศาสตร์ มหาวิทยาลัยขอนแก่น

Preliminary Study of Laparoscopically Assisted Myomectomy: 6 Case-reports

Kovit Khampitak¹, Papada Sansong², Kanok Seejorn¹

¹Department of Obstetrics and Gynecology, Faculty of Medicine, Khon Kaen University.

²Srinagarind Hospital, Faculty of Medicine, Khon Kaen University.

หลักการและวัตถุประสงค์: การผ่าตัดเฉพาะเนื้องอกมดลูกโดยใช้กล้องส่องช่วย เป็นการผ่าตัดแบบทำลายเนื้อเยื่อน้อยซึ่งทำได้ง่ายและสามารถเย็บซ่อมรอยแผลที่มดลูกได้ดี ทั้งนี้ยังคงสามารถลดระยะเวลาพักรักษาตัวภายในโรงพยาบาลได้เช่นเดียวกับการผ่าตัดผ่านกล้องทั่วไป จึงได้ทำการรายงานผู้ป่วย 6 รายแรก ที่ได้รับการผ่าตัดโดยวิธีนี้ ในโรงพยาบาลศรีนครินทร์ มหาวิทยาลัยขอนแก่น

วิธีการศึกษา: รายงานผู้ป่วยจำนวน 6 ราย

ผลการศึกษา: ผู้ป่วยทั้งหมดมีข้อบ่งชี้ในการผ่าตัดเนื้องอกมดลูกและยังต้องการมีบุตร มีอายุนานอายุผู้ป่วย 36 ปี (ช่วง 33-41 ปี) ข้อบ่งชี้ คือ มีเนื้องอกมดลูกร่วมกับ มีเลือดออกผิดปกติ 2 ราย ปวดท้องน้อยและปวดประจำเดือน 2 ราย มีบุตรยาก 2 ราย และกดเบียดอวัยวะข้างเคียง 1 ราย มีผู้ป่วยหนึ่งรายที่มีสองข้อบ่งชี้ มีอายุนานของจำนวนก้อน 1.5 ก้อน (ช่วง 1-2 ก้อน) มีก้อนเนื้องอกทั้งหมด 9 ก้อน 7 ก้อนเป็นชนิด intramural และ 2 ก้อนเป็นชนิด subserosal มีอายุนานของแผลที่หน้าท้อง 4 ซม. (ช่วง 4-5 ซม.) ขนาดของก้อนเนื้องอกมดลูกอยู่ในช่วง 4-8 ซม. (มีอายุนาน 5 ซม.) และน้ำหนักของก้อนมีช่วงระหว่าง 120-250 กรัม (มีอายุนาน 170 กรัม). มีอายุนานของระยะเวลาผ่าตัด 95 นาที (ช่วง 80-110 นาที) และประมาณมีอายุนานการเสียเลือด 50 มล. (ช่วง 20-300 มล.) ไม่พบภาวะแทรกซ้อนระหว่างและหลังผ่าตัด มีอายุนานของระยะเวลาพักรักษาตัวในโรงพยาบาล 2 วัน (ช่วง 2-3 วัน)

สรุป: การผ่าตัดเฉพาะเนื้องอกมดลูกโดยใช้กล้องส่องช่วยเป็นวิธีการผ่าตัดปลอดภัย และอาจใช้ทดแทนการผ่าตัด

Background and Objective: Myomectomy is a treatment option for women who have symptomatic uterine leiomyomas and wish to preserve their childbearing capabilities. Laparoscopically assisted myomectomy (LAM) is a minimally invasive myomectomy which is technically less difficult and allows better closure of the uterine defect and requires a shorter hospital stay. This study was to report the first six nulliparous women who schedule for LAM operations in Srinagarind hospital.

Methods: Six case-reports

Results: All were diagnosed at a median age of 36 years (range 33-41 years). Indications for surgery were abnormal uterine bleeding (2), pelvic pain and dysmenorrhea (2), infertility (2), and pressure effect (1). One patient was diagnosed with two indications. The median number of leiomyomas per patient was 1.5 (range 1-2). Seven of them were intramural type and two were subserosal type. The median length of abdominal skin incision was 4 cm (range 4-5 cm). Leiomyoma diameter ranged from 4 cm to 8 cm (median 5 cm) and weight ranged from 120 g to 250 g (median 170 g). The median operating time was 95 min. (range 80-110 min.). Blood loss was estimated at 50 mL (range 20-300 mL). There were no intra- and postoperative complications. The median postoperative hospital stay was 2 days (range 2-3 days).

Conclusions: The authors recommend LAM technique a safe and technically less difficult procedure when

เฉพาะเนื้องอกมดลูกโดยวิธีเปิดแผลผ่าตัดผ่านผนังหน้าท้อง หรือการผ่าตัดเฉพาะเนื้องอกมดลูกผ่านกล้องได้

คำสำคัญ: การผ่าตัดเฉพาะเนื้องอกมดลูก, การผ่าตัดเฉพาะเนื้องอกมดลูกผ่านกล้อง, การผ่าตัดเฉพาะเนื้องอกมดลูกโดยใช้กล้องส่องช่วย

operating to carefully selected patients instead of using conventional abdominal or laparoscopic myomectomy.

Keywords: Myomectomy, Laparoscopic myomectomy, Laparoscopically assisted myomectomy

ศรีนครินทร์เวชสาร 2554; 26(2): 151-7 • Srinagarind Med J 2011; 26(2): 151-7

Introduction

Leiomyoma is the most frequent benign, hormone sensitive, tumor of the uterus, affecting approximately 25-40% of women of reproductive age¹. Although the majority of women with uterine leiomyomas are asymptomatic, 15% of them require hysterectomy because of the rapid growing of leiomyoma, causing infertility/recurrent abortion, abnormal uterine bleeding, pressure effect or pelvic pain^{2,3}.

Recently gonadotropin-releasing hormone agonist, a non-surgical management of uterine leiomyoma, has been introduced⁴. However, the suppressive effect is mainly temporary and the leiomyoma will regain to initial size and volume in a few months after the treatment⁵. Uterine artery embolization (UAE) is a new vascular intervention technique for non-surgical uterine leiomyoma management which is introduced by interventional radiologists⁶. However, the post UAE high re-admission rates and long term complications are the stressful situation and need for intensive post-procedural follow-up^{7,8}.

Standard treatment for woman with large or symptomatic uterine leiomyoma is total abdominal hysterectomy. Myomectomy via abdomen or laparoscopy is an alternative treatment option in a woman who desires to preserve her fertility. Abdominal myomectomy (AM) was first described by Bonney in 1931⁹. Apart from the conventional AM, laparoscopic myomectomy (LM) and laparoscopically assisted myomectomy (LAM), been introduced and practiced worldwide with the benefits of less postoperative pain, short hospital stay and early recovery.

LAM, a procedure that combines operative laparoscopy and minilaparotomy, was first described

by Nezhat in 1994¹⁰. While LM requires advanced laparoscopic skill and expertise in suturing and tissue removal, LAM is technically less difficult, allows better closure of the uterine defect, and requires less time to perform^{11,12}. Furthermore, LAM offers the same advantages as to LM in removing single and multiple large leiomyomas¹³.

This study aims to report first six successful cases of LAM in Srinagarind hospital, Khon Kaen university.

Surgical procedure

According to timing, the operation should be performed during mid-cycle phase (day 7 to 20) of menstruation. Abdominal and transvaginal ultrasonography or, if necessary, magnetic resonance imaging (MRI) were used to accurately detect the positions and number of leiomyomas. The exact leiomyoma mapping was necessary for the success of surgery. Pre-operative laboratory examination and 2-day bowel preparation were performed in all patients. The procedure first started with the patient under general anesthesia and then in Trendelenburg position. An uterotonic agent, misoprostol (600 µg), was administered by rectal suppository to prevent an excessive blood loss. Foley catheter was inserted and the uterine manipulator was placed through the uterine cervix.

After creating a pneumoperitoneum, the laparoscopic camera was administered through a 12-mm umbilical cannula. The uterine visible morphology was evaluated and compared to ultrasonographic images. After that, the leiomyoma manipulating screw was introduced through the 5-mm left lateral cannula and the leiomyoma was then screwed and lifted upward for the better

exposition of the whole uterus. Laparoscopic injection device with 20 mL dilute epinephrine (1:100,000) was introduced through the 5-mm right lateral cannula and then injected into the uterine surface close to the mass. After that the injected surface was incised 3-4 cm vertically by laparoscopic scalpel until the capsule began to enucleate.

A transverse suprapubic minilaparotomy of about 4-5 cm in length was made. At this stage, the surgeon is required to be careful about carbon dioxide expulsion while incising into the peritoneal cavity. Modified soft plastic abdominal retractor (Fig 1) and Army-Navy were inserted through the incision and retracted for adequate exposure. After that the leiomyoma was moved up towards the abdominal incision by manipulating screw and uterine manipulator. The leiomyoma was then grasped with a towel clip while inserting the surgeon's index finger into the cleavage plane between the tumor and the myometrium, then separating until complete the enucleation. After checking for the active bleeding and suturing with chromic catgut 2-0 interrupted stitches,

the myometrial wound was then closed interrupted or continuous stitches with the same suture material. The oxidized regenerated cellulose barrier was used to cover uterine serosa to prevent postoperative adhesions. As in the case of a large number of leiomyomas, multiple myomectomies must be done under the same operation. For this reason, all of these steps must be well planned before the operation for the best result. The enucleated leiomyoma was then removed from the abdominal cavity (Fig 2) and the abdominal incision was sutured layer by layer. In completing the surgery, the laparoscopy was re-performed to access for bleeding and abdominal cleaning.

After the operation, 7 dosages of cefotaxime were administered every 12 hours during and after the operation. The patients were allowed for ambulation in the next morning and could eat and drink after the occurring of bowel peristalsis. Postoperative analgesic drug (Tramadol 500 mg, intramuscularly) was given if necessary. The patients were discharged after active bowel peristalsis, apyrexia, and easy ambulation.



Figure 1 (Left) Modified soft plastic abdominal retractor, using inner ring of the female condom, was one of an essential equipment for operation through a small incision. It helped to clearly soft tissue identify between abdominal wall and intra-abdominal organ as well as to reduce the abdominal wall trauma from the traction force. (Right) LAM can facilitate multilayer uterine closure in cases of very large or multiple leiomyomas. This technique also avoids the use of thermal energy to achieve hemostasis.

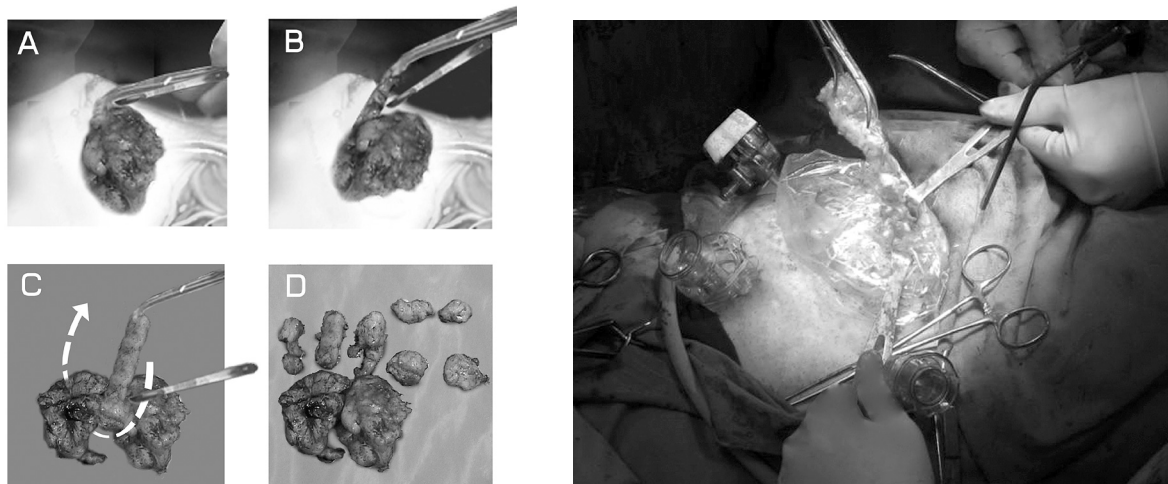


Figure 2 Showed the process of enucleated leiomyoma removal from abdominal cavity through the small incision.

Results

In this study, subjects were six nulliparous women with symptomatic leiomyoma and were indicated for LAM. Their median age was 36 years (range 33-41 years). The indications of surgery were composed of abnormal uterine bleeding (two patients), pelvic pain and dysmenorrhea (two patients), infertility (two patients) and pressure effect (one patient). There was one patient who had two indications. The median number of leiomyomas per patient was 1.5 (range 1-2). Seven of them were intramural type and two were subserosal type. Nearly all were located in uterine fundus, while two of them located in anterior and one in posterior aspect of uterus. The median length of abdominal skin incision was 4 cm (range 4-5 cm). The diameter of leiomyoma ranged from 4 cm to 8 cm (median 5 cm) and weight ranged from 120 g to 250 g (median 170 g). (Table1) The median operating time was 95 min. (range 80-110 min.) and estimate blood loss was 50 mL (range 20-300 mL). There were no intra- and postoperative complications. The median postoperative hospital stay was 2 days (range 2-3 days). (Table 2)

Discussion

Leiomyoma is the most common benign tumor of the uterus, 20-50% of them present with different severity of symptoms, such as abnormal uterine bleeding, pelvic pain, pressure effect or infertility¹. Myomectomy,

a removal of tumor mass procedure without resection of the whole uterus, was first described by Bonney in 1931⁹. It is an important treatment option, especially, for women who wish to preserve their childbearing capabilities. Conventional abdominal myomectomy (AM) is generally considered a standard operation. However, laparoscopic myomectomy (LM) and laparoscopically assisted myomectomy (LAM) are newly alternative methods for the myomectomy procedures.

Laparoscopic myomectomy (LM) was first described in the late 1970 by Semm as a minimal invasive procedure¹⁴. It provides the advantages of small incision, short hospital stay, less postoperative pain, and early return to normal activity¹⁵. However, the operation has been considered as a complicated technique with a high postoperative morbidity rate. It also requires advanced laparoscopic skill, suturing and tissue removal technique¹¹. Many studies indicate that LM may be an appropriate alternative to AM in well-selected patients when is performed by skilled surgeons¹⁶. Parker et al¹⁷ suggested that the criteria for the successfully LM were: 1) uterine size less than or equal to 14 weeks, 2) after 12 weeks of gonadotropin-releasing hormone (GnRH) agonist therapy, 3) no individual leiomyoma larger than 7 cm, 4) no leiomyoma near the uterine artery, 5) no leiomyoma near the tubal cornua if fertility was desired and, 5) at least 50% of the mass placement in the subserosa.

Table 1 General characteristic of the LAM patients

Case Number	1	2	3	4	5
Age	41	35	37	33	37
Indications for operation					
Abnormal uterine bleeding	✓	✓			
Pelvic pain and dysmenorrhea					✓
Infertility			✓		
Pressure effect				✓	
Number of leiomyoma	1	1	2	1	2
Location of leiomyoma					
Anterior			✓		
Posterior			✓		
Fundal	✓	✓		✓	✓✓
Type of leiomyoma					
Intramural	✓	✓	✓✓		✓
Subserous				✓	✓
Diameter of leiomyomas (cm)	5	8	4, 7	5	6, 7
Weight of leiomyomas (g)	180	250	120, 250	170	150, 200

Table 2 Short-term outcomes of the LAM patients

Short-term outcomes	1	2	3	4	5	6
Suprapubic incision (cm)	5	4	5	4	4	4
Estimated blood loss (mL)	50	300	300	20	50	20
Operation time (min.)	85	110	105	80	105	80
Operative complications	-	-	-	-	-	-
Hospitalization	3	2	2	3	2	2

In 1994, Nezhat et al¹⁰ described laparoscopically assisted myomectomy (LAM), a procedure that combines operative laparoscopy and minilaparotomy, for removal of single and multiple large leiomyomas. LAM makes minimally invasive myomectomy accessible to more practitioners by simplifying the procedure and then can reduce the operative time¹³. In addition, it is able to facilitate multilayer uterine closure^{11, 12}. The uterine incision for leiomyoma enucleation in the LAM procedure is shorter than the corresponding LM uterine

incision¹⁸. Size and location of leiomyoma which are serious limitations of LM are considered less restriction in LAM leading to significantly less operative time compared with LM^{13, 19, 20}. LAM also shows early discharge and early return to normal activity¹³.

Kalogiannidis et al²¹ reported the prospective comparative study between LAM (48 patients) and AM (27 patients). The mean estimated blood loss was significantly less in the LAM compared with AM. Similarly, LAM requires less time in performing the

operation. Intra- and postoperative complications were not different between the two groups. The mean days of the bowel reactivity were faster and the duration of hospitalization was shorter in LAM. They concluded that LAM was an effective alternative to conventional AM in selected group of patients.

For a better result of the operation, pre-operative leiomyoma mapping needs to be done in all cases by abdominal and transvaginal ultrasonography or, if necessary, magnetic resonance imaging (MRI). They can provide precise for numbers and positions of the tumors, especially, in multiple leiomyomas. In addition, magnetic resonance imaging (MRI) is a sensitive investigation in reflecting the pathological difference between leiomyoma or adenomyosis^{22, 23}. The authors recommend that a careful pre-operative leiomyoma mapping is an essential procedure leading to a satisfying result.

The median length of abdominal skin incision of this report was 4 cm (range 4-5 cm) that was enough for enucleation, repairing the uterine defect and mass removal. Malinowski et al²⁴ reported that the 3-6 cm diameter of the abdominal skin incision could remove the lesions with diameter 4.7-20 cm. Modified soft plastic abdominal retractor was one of an essential equipment for operation through a small incision¹⁰. It helped to clearly soft tissue identify between abdominal wall and intra-abdominal organ as well as to reduce the abdominal wall trauma from the traction force. (Fig 1)

This report presented an effectively myomectomy procedure comparing to other studies. In this study, leiomyoma diameter ranged from 4 cm to 8 cm (median 5 cm). The median operating time was 95 min. (range 80-110 min) and median estimated blood loss was 50 mL (range 20-300 mL). Kalogiannidis et al²¹ were study in 48 myomectomy patients with LAM procedure, the mean diameter of leiomyomas was 5.8+/-1.9 cm, estimated blood loss was 246 +/- 161 mL and the operating time was 68 +/- 21 min.

Prior to the surgery, the patients need to be advised about the risk of recurrence after myomectomy and the risk of uterine rupture during next pregnancies, as part of decision making. Nezhat et al²⁵ reported a cumulative

risk of recurrence of 10.6% after 1 year, 31.7% after 3 years, and 51.4% after 5 years. The crude rate of recurrence was 27%²⁶. Uterine dehiscence during next pregnancies are a serious complication after myomectomy²⁷. Although it is a rare complication (<1%), the rupture has been commonly occurred before the start of labor²⁸⁻³⁰. There were several reports indicating serious uterine rupture after LM. This might be caused by the complexity of reattaching procedure at the uterine edge, especially, after a surgery of large tumor mass³¹. Pelosi et al.³² reported that electrosurgical dissection could disrupt blood flow to the wound site which might also contribute to suboptimal healing of the myomectomy site and led to dehiscence. LAM technique can facilitate multilayer uterine closure in cases of very large or multiple leiomyomas. This technique also avoids the use of thermal energy to achieve hemostasis.

This report was a preliminary first 6 cases which was small sample size without the controlled group. Then, for the accurate conclusion, we recommend a controlled trial with adequate sample size for the next study.

Conclusion

LAM is a procedure for treatment of symptomatic leiomyoma in women who wish to preserve their childbearing capabilities. LAM is technically less difficult, safe, and applicable to single and multiple large leiomyomas. In addition, it also offers short hospital stay. The authors believe that LAM was a safe and effective technique which is needed for appropriate study design and, then, it might be an alternative to conventional AM or LM in selected patients.

Reference

1. Cramer S. Epidemiology of myomas. *Semin Reprod Endocrinol* 1992; 10:320-4.
2. Stewart EA. Uterine fibroids. *Lancet* 2001; 357:293-8.
3. Vollenhoven BJ, Lawrence AS, Healy DL. Uterine fibroids: a clinical review. *BJOG* 1990; 97:285-98.
4. Lethaby A, Vollenhoven B, Sowter M. Efficacy of pre-operative gonadotrophin hormone releasing analogues for women with uterine fibroids undergoing hysterectomy or myomectomy: a systematic review. *BJOG* 2002; 109:1097-108.

5. Friedman AJ, Daly M, Juneau-Norcross M, Fine C, Rein MS. Recurrence of myomas after myomectomy in women pretreated with leuprolide acetate depot or placebo. *Fertil Steril* 1992; 58:205-8.
6. Walker WJ, Pelage JP. Uterine artery embolisation for symptomatic fibroids: clinical results in 400 women with imaging follow up. *BJOG* 2002; 109:1262-72.
7. Hehenkamp WJ, Volkers NA, Donderwinkel PF, de Blok S, Birnie E, Ankum WM, et al. Uterine artery embolization versus hysterectomy in the treatment of symptomatic uterine fibroids (EMMY trial): peri- and postprocedural results from a randomized controlled trial. *Am J Obstet Gynecol* 2005; 193:1618-29.
8. Spies JB, Spector A, Roth AR, Baker CM, Mauro L, Murphy-Skrzynarz K. Complications after uterine artery embolization for leiomyomas. *Obstet Gynecol* 2002; 100:873-80.
9. Bonney V. The techniques and results of myomectomy. *Lancet* 1931; 220:171-7.
10. Nezhat C, Nezhat F, Bess O, Nezhat CH, Mashlach R. Laparoscopically assisted myomectomy: a report of a new technique in 57 cases. *Int J Fertil Menopausal Stud* 1994; 39(1):39-44.
11. Sinha R, Hegde A, Mahajan C, Dubey N, Sundaram M. Laparoscopic myomectomy: do size, number, and location of the myomas form limiting factors for laparoscopic myomectomy? *J Minim Invasive Gynecol* 2008; 15:292-300.
12. Lee CL, Wang CJ. Laparoscopic myomectomy. *Taiwan J Obstet Gynecol* 2009; 48:335-41.
13. Prapas Y, Kalogiannidis I, Prapas N. Laparoscopy vs laparoscopically assisted myomectomy in the management of uterine myomas: a prospective study. *Am J Obstet Gynecol* 2009; 200:144 e1-6.
14. Semm K. *Atlas of Gynecologic Laparoscopy and Hysteroscopy*. Philadelphia: W.B. Saunders, 1977.
15. Agdi M, Tulandi T. Endoscopic management of uterine fibroids. *Best Pract Res* 2008; 22:707-16.
16. Hurst BS, Matthews ML, Marshburn PB. Laparoscopic myomectomy for symptomatic uterine myomas. *Fertil Steril* 2005; 83:1-23.
17. Parker WH, Rodi IA. Patient selection for laparoscopic myomectomy. *J Am Assoc Gynecol Laparosc* 1994; 2:23-6.
18. Nezhat C, Siegler A, Nezhat F, Seidman D, Luciano A. *Laparoscopic operations on the uterus. Operative gynaecologic laparoscopy (principles and techniques)*. 2nd ed. New York: McGraw-Hill, 2000:267.
19. Glasser MH. Minilaparotomy myomectomy: a minimally invasive alternative for the large fibroid uterus. *J Minim Invasive Gynecol* 2005; 12:275-83.
20. Nezhat C, Nezhat F, Silfen SL, Schaffer N, Evans D. Laparoscopic myomectomy. *Inter J Fertil* 1991; 36:275-80.
21. Kalogiannidis I, Prapas N, Xiromeritis P, Prapas Y. Laparoscopically assisted myomectomy versus abdominal myomectomy in short-term outcomes: a prospective study. *Arch Gynecol Obstet* 2010; 281:865-70.
22. Mitchell DG, Outwater EK. Benign gynecologic disease: applications of magnetic resonance imaging. *Top Magn Reson Imaging* 1995; 7:26-43.
23. Byun JY, Kim SE, Choi BG, Ko GY, Jung SE, Choi KH. Diffuse and focal adenomyosis: MR imaging findings. *Radio Graphics* 1999; 19:S161-70.
24. Malinowski A, Matyszewski A, Bartosiak-Majcher I, Wojciechowski M. [Assesment of selected parameters depending on the size of abdominal wall incision in patients subjected to minilaparotomy due to benign gynaecological diseases]. *Ginekologia polska* 2008; 79:192-7.
25. Nezhat FR, Roemisch M, Nezhat CH, Seidman DS, Nezhat CR. Recurrence rate after laparoscopic myomectomy. *J Am Assoc Gynecol Laparosc* 1998; 5:237-40.
26. Rossetti A, Sizzi O, Soranna L, Cucinelli F, Mancuso S, Lanzone A. Long-term results of laparoscopic myomectomy: recurrence rate in comparison with abdominal myomectomy. *Hum Reprod* 2001; 16:770-4.
27. Harris WJ. Uterine dehiscence following laparoscopic myomectomy. *Obstet Gynecol* 1992; 80:545-6.
28. Oktem O, Gokaslan H, Durmusoglu F. Spontaneous uterine rupture in pregnancy 8 years after laparoscopic myomectomy. *J Am Assoc Gynecol Laparosc* 2001; 8:618-21.
29. Lieng M, Istre O, Langebrekke A. Uterine rupture after laparoscopic myomectomy. *J Am Assoc Gynecol Laparosc* 2004; 11:92-3.
30. Friedmann W, Maier RF, Luttkus A, Schafer AP, Dudenhausen JW. Uterine rupture after laparoscopic myomectomy. *Acta Obstet Gynecol Scand* 1996; 75:683-4.
31. Parker WH. Laparoscopic myomectomy and abdominal myomectomy. *Clin Obstet Gynecol* 2006; 49:789-97.
32. Pelosi MA, 3rd, Pelosi MA. Spontaneous uterine rupture at thirty-three weeks subsequent to previous superficial laparoscopic myomectomy. *Am J Obstet Gynecol* 1997; 177:1547-9.

