

Assessment of selected perioperative parameters in patients undergoing laparoscopic and abdominal supracervical hysterectomy

Jakub Sokołowski¹, Joanna Skręt-Magierło^{1,2}, Tomasz Kluz^{1,2}, Edyta Barnaś², Marek Sobolewski³, Renata Raś¹, Andrzej Skręt¹

¹Provincial Clinical Hospital No. 1, Rzeszów, Poland

²Institute of Obstetrics and Emergency Medicine, University of Rzeszów, Rzeszów, Poland

³Institute of Quantitative Methods, Rzeszów University of Technology, Rzeszów, Poland

Abstract

Introduction: Subtotal hysterectomy is a method of treatment of patients with mild changes in the uterine body. Laparoscopic methods are increasingly used in surgical gynaecology. One of the limitations of laparoscopy is the proper level of operating surgeon's training, which may be assessed with the use of the learning curve. The aim of the study was to compare data regarding the perioperative period in patients who underwent subtotal hysterectomy with the two methods, and to establish a learning curve for laparoscopic subtotal hysterectomy.

Material and methods: One hundred and twenty-seven patients qualified for subtotal hysterectomy due to mild disturbances in the uterine body participated in the study. The study was conducted at the Clinical Department of Gynaecology and Obstetrics of Fryderyk Chopin Provincial Specialist Hospital in Rzeszów in 2012-2013.

Results: The time of laparoscopic subtotal hysterectomy is longer than that of the classical surgical procedure. Uterine myomas are the main indication for subtotal hysterectomy. Laparoscopic operation results in lower blood loss compared to the classical surgical method. The mean age of the patients operated due to mild changes in the uterine body is similar in both groups. Patients who are obese or have undergone Caesarean sections are more frequently qualified for the classical surgery. The study revealed a reduction in time of laparoscopic subtotal hysterectomy by ca. 31 minutes (33%).

Conclusions: Laparoscopic subtotal hysterectomy is a method chosen by operating surgeons for patients with a lower perioperative risk. The period of the study made it possible to determine a learning curve for laparoscopic subtotal hysterectomy.

Key words: subtotal hysterectomy, laparoscopic surgical procedure, classical surgical procedure.

Introduction

Laparoscopy, previously a rare procedure, is becoming a standard access technique in gynaecological surgery. It is due to the development of instruments and increasing number of specialists able to use this method.

Hysterectomy is the second most common surgical procedure performed in women, after the Caesarean section. In the United States the chances of undergoing this operation at some point in life are estimated at 45%. Approximately 600 thousand hysterectomies are performed there per year [1]. Until the mid-eighties, abdominal or vaginal access was available to the surgeon performing hysterectomy. In the late 80s, Reich was the first one to conduct laparoscopic removal of the uterus [2-4]. In 1991, Semm described laparoscopic removal of the uterine body, which he referred to as the classic intrafascial supracervical hysterectomy [5].

As any surgical procedure, laparoscopic operations require experience. It has been estimated that the learning curve requires performing ca. 25 procedures.

During the period of introducing the laparoscopic technique, it coexists with abdominal hysterectomy. This period allows to conduct a study comparing both methods.

The aim of the study was to: 1) compare data regarding the perioperative period in patients who underwent subtotal hysterectomy with the two methods, and to 2) establish a learning curve for laparoscopic subtotal hysterectomy.

Material and methods

The study was started after permission from the Bioethical Committee of the University of Rzeszów (no. 7/04/2012) of 18 April 2012 had been granted. It in-

Corresponding author:

Jakub Sokołowski, Provincial Clinical Hospital No. 1 in Rzeszów, 2 Szopena St., 35-055 Rzeszów, Poland, e-mail: kubok4@op.pl

Submitted: 19.05.2015

Accepted: 26.11.2015

volved 127 patients of the Clinical Department of Gynaecology and Obstetrics of Fryderyk Chopin Provincial Specialist Hospital in Rzeszów in the period between January 2012 and July 2013. The patients were referred to the department due to mild changes in the uterine body. They were qualified for a surgical procedure by the Head of the Department. The decision regarding the surgical method was made by the operating surgeon. Patients underwent subtotal hysterectomy performed with a classical or laparoscopic technique. In all the patients, preoperative fractional curettage was conducted. Patients who underwent laparoscopic subtotal hysterectomy received standard prophylactic treatment with antibiotics. Following catheterisation of the urinary bladder and placing the patient in a lithotomy position, pneumoperitoneum was induced using a Veress needle. The intraperitoneal pressure was ca. 15 mm Hg. Visual tracking and two work tools were inserted on each side. The first one at the level of anterior superior iliac spine, and the other one 4 cm above. The laparoscopic subtotal hysterectomy technique used was based on Jenkins' classical work [6]. Its main stages include preparation with the use of precise dissecting forceps, and haemostasis with bipolar forceps. Using graspers and bipolar forceps, the round ligament and proper ovarian ligament were coagulated and bilaterally cut. If removal of appendages was required, the infundibulopelvic ligament was coagulated and cut. After cutting of the anterior lamina of the broad ligament of the uterus, the ascending branch of the uterine artery was presented. Preparation for excision of the uterine body involved careful coagulation and cutting of all the branches of uterine arteries. The uterine body was cut off the cervix with the use of monopolar loop, and extracted with a morcellator.

The only divergence from Jenkins' technique was abstaining from coagulation of the endocervix.

The classical technique applied in the study was based on the premises presented in The Linde's Operative Gynaecology textbook [7]. Patients who underwent classical subtotal hysterectomy received standard prophylactic treatment with antibiotics. The catheter was left in the urinary bladder. The abdominal cavity was opened with a scalpel, by Pfannenstiel incision. Follow-

ing inspection of the organs, cloths were placed in the abdominal cavity to improve the visibility of the surgical field. Heaney clamps were placed bilaterally on the parametrium in order to facilitate manipulation of the uterine body. The round ligament and proper ovarian ligament were suspended and cut. If removal of appendages was required, the infundibulopelvic ligament was ligated and cut. Using preparation scissors, the broad ligament of the uterus was cut until the ascending branches of the uterine artery were presented. Bilateral absorbable sutures were placed, and the uterine body was excised with a scalpel. To obtain haemostasis, haemostatic "figure-of-eight" sutures were placed on the cervical stump.

The collected data were statistically analysed using the Statistica 8.0 software. The assumed statistical significance level was $p < 0.05$.

Results

Table I presents clinical characteristics of the patients qualified for the study. Patients treated with laparoscopic surgery (group I, $n = 61$), treated with classical surgery (group II, $n = 66$).

Patients who underwent laparoscopic subtotal hysterectomy had a lower body mass index, less often had previous Caesarean sections or laparotomies; however, their age and indications for the surgical procedure did not differ.

Table II presents data regarding the patients' perioperative period. Patients treated with laparoscopic surgery (group I, $n = 61$), treated with classical surgery (group II, $n = 66$).

The laparoscopic procedure was longer (79.4 min), whereas duration of laparotomy was 71.1 min. However, laparoscopy was associated with lower blood loss and shorter postoperative hospitalisation.

The learning curve according to the period of the study, i.e. 18 months, is presented in Figure 1.

The presented linear model demonstrates a correlation between the study period and duration of the surgical procedure. The correlation coefficient is statistically significant, and mean duration of the surgical procedure was decreasing by ca. 2 minutes with each month of the study.

Tab. I. Characteristics of the study group

Clinical characteristics	Group I ($n = 61$)	Group II ($n = 66$)	Statistical significance
Age	47.4	48.8	0.4092
Body mass index (BMI)	26.0	28.0	0.0171
Previous Caesarean sections	8 (13.1%)	24 (36.4%)	0.019
Previous laparotomies	3 (4.9%)	10 (15.2%)	0.0398
Indications for the surgical procedure:			
1 – uterine myomas	54 (88.5%)	59 (89.4%)	0.8758
2 – adenomyosis	7 (11.5%)	7 (10.6%)	

Tab. II. Clinical data regarding the perioperative period

Perioperative period data	Group I (n = 61)	Group II (n = 66)	Statistical significance
Duration of the surgical procedure (minutes)	79.4; 50-145	71.1; 40-125	0.0222
Blood loss assessed by the difference between haemoglobin concentrations in blood (Δ Hb g%)	0.97; 0.1-3.5	1.79; 2.9-5.0	0.0000
Postoperative hospitalisation time (days)	2.1; 1-4	4.5; 3-7	0.0000

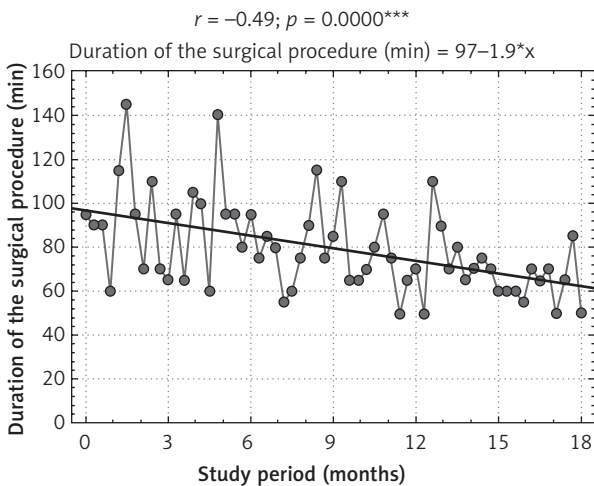


Fig. 1. Correlation between the study period and duration of the surgical procedure

Mean duration of the surgical procedure in 3-month periods is presented in Figure 2.

In 18 months, mean duration of the surgical procedure was reduced by approx. 31.3 minutes (from 94 mins in the first month of the study to 62.7 mins in the last month of the study). Standard deviation also decreased (from 25 mins in the first month of the study to ca. 10 mins in the last month of the study). It may indicate a better surgical technique presented in further patients.

Discussion

The comparison of two subtotal hysterectomy techniques, i.e. laparoscopic and abdominal method, demonstrated in the study was conducted in the period of introducing the laparoscopic technique. The study was not randomised. Randomised studies available in the literature of the subject refer only to the classical method [8-10]. A similar study was conducted in the authors' centre in a transitional period during introduction of nerve sparing radical hysterectomy [11].

Application of one or the other technique was determined by operating surgeons – as in the above study. It is interesting that they qualified for the laparoscopic procedure patients with a lower body mass index and women who less often had undergone Caesarean sections or laparotomies. This is due to the fact that, according to classical standards, obesity and postopera-

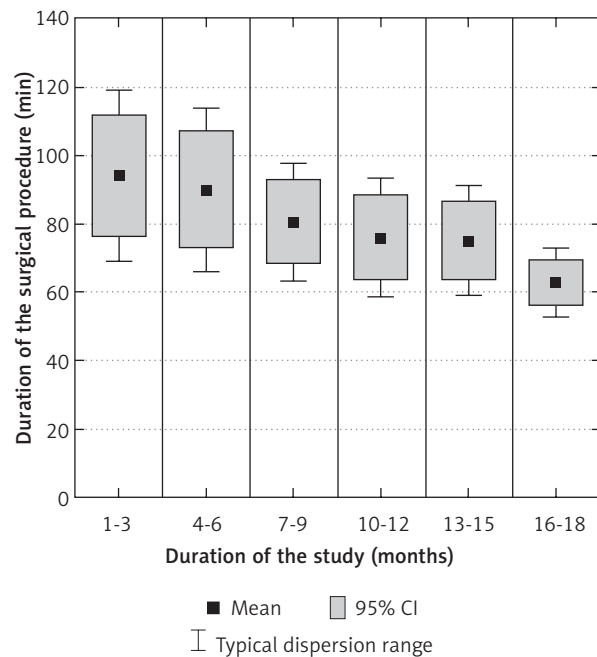


Fig. 2. Mean duration of the surgical procedure

tive adhesions were contraindications for laparoscopy, whereas presently adhesions and obesity not only are not contraindications, but have become indications for laparoscopy. Laparoscopic access is increasingly used not only in mild changes of the uterine body, but also in endometrial cancer operations [12, 13]. In the author's centre total laparoscopic hysterectomies have also been performed for a few years, particularly in oncological cases, including endometrial cancer. Subtotal hysterectomy was performed for non-oncological reasons, and it is in compliance with current principles where subtotal hysterectomy enables preservation of the tendon ring around the cervix, and it prevents stasis disorders.

Recently there have been studies performed to identify the risk of unexpected malignancies during morcellation. It is worth stating that uterine leiomyomas (ULMS) and endometrial cancer are not often found in patients who undergo morcellation [14, 15]. But on the other hand, the morcellation increases the overall and intra-abdominal recurrence rate as well as the death rate [16].

Bogani *et al.* suggest that transvaginal extraction (TVE) may be an alternative to morcellator application which brings limitation of unexpected ULMS spread. In this study TVE appeared to bring a shorter surgery time

and hospital stay [17]. The risk of tissue dissemination can be reduced by using in-bag power morcellation but it prolongs the surgery time [18].

Selecting the appropriate route of hysterectomy is an important decision in elderly women. In this group of patients, most common indication is endometrial, ovarian and vulvar cancer as well as benign indication such as pelvic organ prolapse [19]. The literature supports the opinion that, when feasible, vaginal hysterectomy is the safest and most cost-effective route to remove the uterus. Women with benign indications for hysterectomy presenting pelvic organ prolapse can be candidates for vaginal hysterectomy. This approach is related with a shorter hospital stay, faster return to normal activity and fewer febrile episodes or unexpected infections [20].

Conclusions

Patients with previous Caesarean sections or laparotomies, as well as women with a higher body mass index were less often qualified for laparoscopic subtotal hysterectomy.

The time of laparoscopic subtotal hysterectomy was longer than that of the classical surgical procedure. However, blood loss assessed by the decrease in haemoglobin concentrations was lower, and postoperative hospitalisation time was shorter in the group of patients who underwent the laparoscopic procedure.

The learning curve demonstrated a reduction in duration of laparoscopic subtotal hysterectomy by approx. 31.3 minutes (ca. 33%) in 18 months.

Disclosure

Authors report no conflict of interest.

References

- Buie VC, Owings MF, DeFrances CJ, et al. National Hospital Discharge Survey: 2006 Annual Summary. National Center for Health Statistics. Vital Health Stat 2010; 13(168).
- Farquhar CM, Steiner CA. Hysterectomy rates in the United States 1990-1997. *Obstet Gynecol* 2002; 99: 229-234.
- Lyons TL. Laparoscopic supracervical hysterectomy. *Obstet Gynecol Clin North Am* 2000; 27: 441-449.
- Carlson KJ. Outcomes of hysterectomy. *Clin Obstet Gynecol* 1997; 40: 939-946.
- Semm K. Hysterectomy via laparotomy or pelvicoscopy: A new CASH method without colpotomy. *Geburtshilfe Frauenheilkd* 1991; 51: 996-1003.
- Jenkins TR. Laparoscopic supracervical hysterectomy. *Am J Obstet Gynecol* 2004; 191: 1875-1884.
- Rock JA, Jones HW III (eds.). *TeLinde's Operative Gynecology*. Lippincott Williams & Wilkins, Philadelphia 2003; 732-749.
- Learman LA, Summitt RL Jr, Varner RE, et al. A randomized comparison of total or supracervical hysterectomy: surgical complications and clinical outcomes. Total or Supracervical Hysterectomy (TOSH) Research Group. *Obstet Gynecol* 2003; 102: 453-462.
- Thakar R, Ayers S, Clarkson P, et al. Outcomes after total versus subtotal abdominal hysterectomy. *N Engl J Med* 2002; 347: 1318-1325.
- Gimbel H, Zobbe V, Andersen BM, et al. Randomised controlled trial of total compared with subtotal hysterectomy with one-year follow up results. *BJOG* 2003; 110: 1088-1098.
- Skret-Magierlo J, Naróg M, Kruczek A, et al. Radical hysterectomy during the transition period from traditional to nerve-sparing technique. *Gynecol Oncol* 2010; 116: 502-505.
- Manolitsas TP, McCartney AJ. Total Laparoscopic Hysterectomy in the Management of Endometrial Carcinoma. *Journal of the American Association of Gynecologic Laparoscopists* 2002; 9: 54-62.
- Malinowski A, Makowska J, Antosiak B. Całkowicie laparoskopowe wycięcie macicy – wskazania i powikłania u 158 pacjentek. *Ginekol Pol* 2013; 84: 252-257.
- Theben JU, Shellong AR, Altgassen C. Unexpected malignancies after laparoscopic-assisted supracervical hysterectomies (LASH): an analysis of 1,584 LASH cases. *Arch Gynecol Obstet* 2013; 287: 455-462.
- Bogani G, Serati M, Cromi A. Risk of undiagnosed uterine malignancies at the time of robotic supracervical hysterectomy and sacrocolpopexy. *Eur Urol* 2015; 67: 352.
- Bogani G, Cliby WA, Aletti GD. Impact of morcellation on survival outcomes of patients with unexpected uterine leiomyosarcoma: a systematic review and meta-analysis. *Gynecol Oncol* 2015; 137: 167-172.
- Bogani G, Ucella S, Cromi A. Electric motorized morcellator versus transvaginal extraction for myoma retrieval after laparoscopic myomectomy: a propensity-matched analysis. *J Minim Invasive Gynecol* 2014; 21: 928-934.
- Vargas MV, Cohen SL, Fuchs-Weizman N. Open power morcellation versus contained power morcellation within an insufflated isolation bag: comparison of perioperative outcomes. *J Minim Invasive Gynecol* 2015; 22: 433-438.
- Borsuk A, Skret-Magierlo J, Kluz T, Skret A. Operacje ginekologiczne u kobiet powyżej 70. roku życia. *Prz Menopauzalny* 2008; 6: 308-313.
- Nieboer TE, Johnson N, Lethaby A, et al. Surgical approach to hysterectomy for benign gynaecological disease. *Cochrane Database Syst Rev* 2009; 3: CD003677.