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

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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-
volved 127 patients of the Clinical Department of Gy- 
aecology 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 con-
ducted. Patients who underwent laparoscopic subto-
tal hysterectomy received standard prophylactic treat-
ment with antibiotics. Following catheterisation of 
the urinary bladder and placing the patient in a 
lithotomy position, pneumoperitoneum was induced using a Veress 
noodle. 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 lapa-
roscopic 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 bilater-
ally cut. If removal of appendages was required, the in-
fundibulopelvic 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 ex-
tracted 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 Opera-
tive Gynaecology textbook [7]. Patients who underwent 
classical subtotal hysterectomy received standard pro-
phyllactic 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 para-
metrium 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 “fig-
ure-of-eight” sutures were placed on the cervical stump.

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

**Results**

Table I presents clinical characteristics of the pa-
tients qualified for the study. Patients treated with lapa-
roscopic surgery (group I, $n = 61$), treated with classical 
surgery (group II, $n = 66$).

Patients who underwent laparoscopic subtotal hys-
terectomy 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’ peri-
operative 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. How-
ever, 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 correla-
tion between the study period and duration of the 
surgical procedure. The correlation coefficient is sta-
tistically significant, and mean duration of the surgical 
procedure was decreasing by ca. 2 minutes with each 
month of the study.

| 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%)          |                        |
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 postoperative 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 leiomyosarcomas (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.

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