

Hysterectomies for benign pathology: seven-year experience of a single tertiary care institution

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Summary

Purpose of investigation: To assess three different types of hysterectomies for benign pathology at Vilnius University Hospital Santaros Klinikos (VUH SK). **Materials and Methods:** The medical records of 1361 patients who underwent hysterectomy for benign pathology at the Centre of Obstetrics and Gynecology Vilnius University Hospital Santaros Klinikos between January 1, 2010 and December 31, 2016 were retrospectively reviewed. The comparison was made by evaluating the following data: patients' age, indications of surgery, operating time, blood loss, hospital stay, uterine size, histological analysis, and complications. Data was considered statistically significant when p -value was less than 0.05. **Results:** During the study period, 1,361 hysterectomies were performed (vaginal hysterectomy - 41% ($n=552$), laparoscopic hysterectomy - 30% ($n=413$), and abdominal hysterectomy - 29% ($n=396$). Mean age of the patients was 55 ± 12 years. In vaginal hysterectomy group patients were significantly older. Uterine size was larger in abdominal and laparoscopic hysterectomy groups. Operating time was longer using the laparoscopic route than the abdominal or vaginal. The mean blood loss was lowest in laparoscopic hysterectomy group compared with the other groups. The shortest hospital stay was also in the laparoscopic group. **Conclusion:** The laparoscopic hysterectomies have the shortest hospital stays and the lowest blood loss in comparison with abdominal and vaginal groups. Abdominal and vaginal hysterectomies are shorter, however, the duration of laparoscopic hysterectomies is becoming shorter annually. The complications' rates between groups do not differ significantly.

Key words: Laparoscopic hysterectomy; Abdominal hysterectomy; Vaginal hysterectomy.

Introduction

Hysterectomy is one of the most common gynecological surgeries in the world [1]. Every year, 600,000 hysterectomies are performed in the United States [2], 72,000 in France, and about 80,000 in the United Kingdom [3].

For a long time only abdominal and vaginal hysterectomies were performed. In 1988 Harry Reich brought a revolution in gynecology by performing the first laparoscopic hysterectomy [4]. There are currently four main types of hysterectomies: abdominal, vaginal, laparoscopic, and laparoscopically-assisted vaginal hysterectomies (LAVH). So far, there is no generally accepted algorithm in the European Medical Association, which could be followed when choosing the type of surgery [3, 5, 6]. Doctors choose the type of surgery according to their training, experience, skills, and taking the patient desires into account [7].

In Obstetrics and Gynecology Center of Vilnius University Hospital Santaros Klinikos (VUH SK) laparoscopic hysterectomies began to be performed in the 2010. Since then, all four types of hysterectomies have been performed in VUH SK. The aim of this research is to overview tendencies of three main methods (abdominal, vaginal, and laparoscopic hysterectomies) in VUH SK and to compare them.

Materials and Methods

A retrospective study was carried out in Gynaecology Department of VUH SK. Ethical approval was obtained from the Hospital Ethics and Medical Research Committee.

Data was collected from the medical records of the operated patients. The study enrolled patients who underwent hysterectomy for benign pathology from January 1, 2010 until December 31, 2016.

The primary analysis included 1,511 patients, 88 of them did not pass for further study due to inaccurate or incomplete information in patients' medical records. Furthermore, LAVH group was withdrawn from further analysis, because of insufficient amount of patients (62). The final analysis included 1,361 women. The study evaluated the following data: age, indications of surgery, type of surgery, operating time, blood loss, uterine size, histological analysis, and complications.

Statistical analysis of data was conducted in Excel 2010 and SPSS v17 software. The data was considered to be statistically significant at p -value less than 0.05.

Results

The average age of patients who underwent hysterectomy due to benign pathology, was 55 ± 12 years; minimal age: 24 years, maximum age: 90 years. Patients, who belonged to vaginal hysterectomies group, statistically, were significantly older than patients in laparoscopic hysterectomy group ($p < 0.05$). The main indications of hysterectomies

Table 1. — *Indications of hysterectomies by type.*

	Vaginal	Laparoscopic	Abdominal
Symptomatic myomas	30% (n=166)	76% (n=314)	86% (n=342)
Abnormal bleeding from the uterus	19% (n=106)	21% (n=85)	43% (n=170)
Adenomyosis	13% (n=73)	21% (n=85)	25% (n=98)
Benign adnexal tumor	1% (n=5)	11% (n=45)	23% (n=92)
Endometriosis	1% (n=7)	5% (n=19)	7% (n=26)
Endometrial hyperplasia	3% (n=14)	8% (n=31)	4% (n=14)
Genital prolapse	54% (n=296)	6% (n=24)	3% (n=10)
Chronic pelvic pain	1% (n=6)	2% (n=8)	8% (n=31)
Endometritis	0% (n=0)	1% (n=2)	1% (n=3)

Table 2. — *Characteristics of hysterectomies by type.*

	Vaginal	Laparoscopic	Abdominal	<i>p</i> -value
Age (\pm SD)	60 \pm 12	51 \pm 9	50 \pm 9	<0.05
The mean operating time (min)(\pm SD)	78 \pm 32	104 \pm 37	91 \pm 30	<0.05
Blood loss (ml)(\pm SD)	187 \pm 171	116 \pm 116	290 \pm 225	<0.05
Hospital stay (days)	5 \pm 2	4 \pm 2	7 \pm 4	<0.05
Size of uterus (weeks) (\pm SD)	4 \pm 6	10 \pm 6	12 \pm 7	= 0.001
Other gynaecological pathology	136 (24.6%)	152 (36.7%)	171 (42.8%)	<0.05

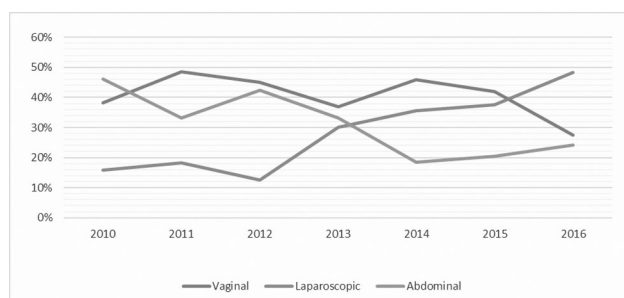


Figure 1. — Rates of hysterectomies by type each year.

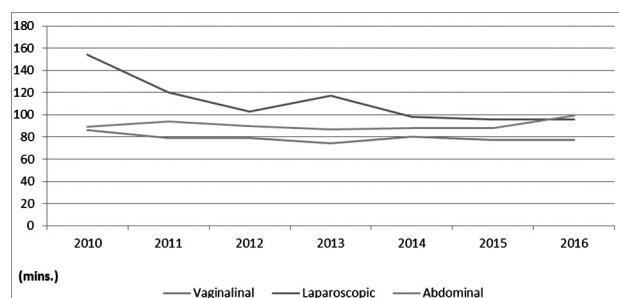


Figure 2. — Rates of hysterectomies duration each year.

due to benign pathology were distinguished: symptomatic myomas, abnormal bleeding from the uterus, adenomyosis, benign adnexal tumors, endometriosis, endometrial hyperplasia, genital prolapse, chronic pelvic pain, and endometritis. The most frequent indications were uterine myomas: 60.1% (n=818), abnormal uterine bleeding: 26.3% (n=358), genital prolapse: 24.2% (n=330), adenomyosis: 18.8% (n=256), and adnexal tumor: 10.4% (n=142) (Table 1). More than one gynaecological pathology included 38.1% (n=519) of women. Women in abdominal hysterectomy group had other gynaecological pathologies more often than in vaginal and laparoscopic hysterectomy groups ($p < 0.05$) (Table 2).

According to the type of hysterectomy patients were divided into 3 groups: patients, who had laparoscopic, abdominal and vaginal hysterectomy. The major part of all performed 1361 surgeries composed vaginal - 41% (n=552) and laparoscopic - 30% (n=413) hysterectomies. Fewer abdominal hysterectomies (29%; n=396) were performed (Figure 1).

Conversion to laparotomy was defined as a laparotomy procedure performed for some reason in the vaginal and laparoscopic groups. In total 19 (1%) conversions to laparotomy were performed, 70% (n=14) of which in the laparoscopic hysterectomies group, and 25% (n=5) in the vaginal hysterectomies group. The most conversions were performed due to poor accessibility - 49 (79%) and bleeding - 5 (8%).

Presence of extra-uterine factors (endometriosis, benign adnexal tumor, presence of adhesions in pelvis, etc.) were taken into account, which could affect the conversion to laparotomy. Forty-five percent of patients in whom conversion to laparotomy was performed had these risk factors.

Uterine size by weeks was statistically significantly larger in the abdominal and laparoscopic groups ($p = 0.001$) compared with vaginal hysterectomies (Table 2).

The mean durations of surgery in minutes in laparoscopic hysterectomies groups were statistically significantly longer than in abdominal ($p = 0.007$) and vaginal ($p = 0.001$) groups (Table 2). The duration of laparoscopic hys-

Table 3. — *Complications of hysterectomies by type.*

Complication	Vaginal, n (%)	Laparoscopic, n (%)	Abdominal, n (%)
Fever > 38°C	2 (0.4%)	8 (1.9%)	8 (2.0%)
Wound infection	0 (0%)	10 (2.4%)	5 (1.2%)
Blood transfusion	3 (0.5%)	1 (0.2%)	3 (0.8%)
Pelvic haematoma	2 (0.4%)	2 (0.5%)	2 (0.5%)
Vesicovaginal fistula	0 (0%)	1 (0.2%)	1 (0.3%)
Ureterovaginal fistula	0 (0%)	1 (0.2%)	0 (0%)
Pelvic abscess	3 (0.5%)	0 (0%)	1 (0.3%)
Bladder injury	3 (0.5%)	2 (0.5%)	2 (0.5%)
Ureteral injury	1 (0.2%)	2 (0.5%)	1 (0.3%)
Urethral injury	1 (0.2%)	0 (0%)	0 (0%)
Intestinal injury	0 (0%)	1 (0.2%)	0 (0%)
Vaginal cuff bleeding	0 (0%)	0 (0%)	1 (0.3%)

terectomies is becoming shorter annually. The durations of surgeries were statistically significantly shorter in 2016 than in 2010 ($p < 0.001$).

As with all types of surgery, a hysterectomy can sometimes lead to complications. Although their incidence is low, it is important to be aware of the complications that can result from hysterectomies. In the present study postoperative fever was considered to be a febrile fever of (38.5°C), by measuring at least two times every six hours, excluding the first postoperative day. Bleeding was evaluated according to clinical signs and the need for transfusions. The most common complications were fever and wound infection. No significant difference between the groups was observed (Table 3).

Statistically significantly lower mean blood loss (ml) was in laparoscopic hysterectomies group compared to the other groups ($p < 0.05$) (Table 2). Comparing blood loss (ml) during laparoscopic hysterectomies in 2010 and 2016, at 202 ± 160 ml and 86 ± 116 ml, respectively, blood loss was significantly lower in 2016 ($p < 0.001$). During the postoperative period, 1% of patients needed transfusion, however, no significant difference in groups was observed.

The average number of bed-days in laparoscopic hysterectomies group was statistically significantly lower than in abdominal hysterectomy group ($p < 0.05$) (Table 2). Patients, who had conversion to laparotomy, remained in hospital on average for 6 ± 3 days.

Discussion

Hysterectomy is the second most often performed gynecological surgery in the world [3]. Despite the fact that more than 30 studies were published, which compare different methods of surgeries, there is still no universally accepted agreement which surgery method to choose in a specific clinical case [4-6]. The choice of method in practice usually depends on the surgeon's experience, skills, and specific hospital practice [4, 7].

Most studies compare only two or three of the four meth-

ods of hysterectomy. Only one research was found, which included all four types of hysterectomy: abdominal, vaginal, laparoscopic, and laparoscopically-assisted vaginal hysterectomies [3]. The reason is that there are controversial opinions on how to define and assign laparoscopically-assisted vaginal hysterectomy. Some authors distinguish it as laparoscopic [8], while others as strain of vaginal hysterectomy [9], and third ones distinguish it as a separate method [7]. Also, based on literary data, these surgeries on their parameters are often distinguished from other methods [7, 10]. We consider LAVH to be a separate hysterectomy method, although had to withdraw it from our study, because of lack of patients in that group.

Harry Reich, the author of the first laparoscopic hysterectomy, pursued to replace abdominal hysterectomies with new method. However, the new method began to change not only abdominal, but also vaginal hysterectomies [9]. In the present research the authors also had noticed this trend: the number of laparoscopic hysterectomies grew while abdominal hysterectomies decreased by 23% and vaginal hysterectomies decreased by 10% (Figure 2).

VUH SK mainly performs vaginal hysterectomies. Similar data is presented in literature. Research conducted in French university hospitals had shown that vaginal hysterectomies reached 48.3%, the second place was taken by abdominal hysterectomies (24.4%), somewhat less were performed laparoscopic (19.1%), and laparoscopically-assisted vaginal hysterectomies (8.2%) [3]. Meanwhile in USA, abdominal hysterectomies prevail and significantly fewer are vaginal (22%) and laparoscopic hysterectomies are being performed (12%) [11], but this trend probably will change due to the overwhelming success of robotic surgery in this country.

The most common indications to perform hysterectomy were symptomatic uterine leiomyoma, uterine adenomyosis, genital prolapse, and menorrhagia [1, 3, 12, 13]. Although indications did not differ significantly between the groups, we can notice a tendency that in presence of genital prolapse vaginal hysterectomy is chosen more often than the other methods. Meanwhile, in presence of uterine

fibroid or adenomyosis uteri, abdominal hysterectomy is chosen more often. Laparoscopic hysterectomies are more often performed in presence of benign adnexal tumors.

The average age of patients, who experience hysterectomy due to benign pathologies, varies from 44 to 54 years. [3, 6, 14]. The average age of patients, who had experienced vaginal hysterectomy, is higher than in other hysterectomy groups. It is assumed that such distribution of the average age between the groups is determined by the most common indication of vaginal hysterectomy, which is genital prolapse, typical for older women.

Uterine size in weeks was larger in abdominal hysterectomies. Controversial opinion is prevailing whether uterine size should determine the choice of the type of surgery. Some authors' state, that in presence of large uterus, laparoscopic hysterectomy should not be the first preferred method. A large uterus interferes with visibility, complicates manipulation in the abdominal cavity, which extends the duration of surgery, increases the risk of damage and bleeding of the adjacent organs [1]. Other authors argue that choice of hysterectomy method depends on surgeon's experience, therefore in the presence of a large uterus, it is possible to choose any operator-friendly method of hysterectomy [7].

The mean duration of surgery is longer in the laparoscopic hysterectomy group compared with the abdominal hysterectomies. In presence of large uterus, when uterine size reduction is applied during laparoscopy, duration of surgery is prolonged [10]. VUH SK comply with tactics, that older patients with large uterus, should choose a method of abdominal hysterectomy, due to shorter duration of the surgery, lower risk of thrombosis, better visibility, and lower risk of spread of undiagnosed uterine sarcoma or adenocarcinoma through abdominal cavity. It was noticed that the duration of laparoscopic surgery has been decreasing each year; it is associated with increasing surgical experience. It is also important to emphasize that studies, which include hysterectomies performed only by experienced surgeons, do not show the difference between the duration of surgeries of the laparoscopic and abdominal hysterectomies [7].

Laparoscopic hysterectomy from other types of hysterectomies is distinguished by lower blood loss during surgery and the number of bed-days. Blood loss during surgery annually decreased. This was due to the gained experience [13]. The lowest number of bed-days remains in laparoscopic hysterectomy group. Often, because of this advantage, laparoscopic hysterectomy outweighs vaginal hysterectomy [3], however, in this research it did not differ significantly.

The overall total hysterectomy rate has remained relatively stable but the proportion of hysterectomy types has changed. The shortest hospital stays, the lowest blood loss, shorten operating time, and better operating technic explains why the number of laparoscopic hysterectomies has been growing annually and the other types of hysterectomy

have been decreasing. With advances in technology and more emphasis on laparoscopy training, it will be interesting to assess whether the rate of laparoscopic hysterectomy will continue to increase in the future.

Conclusion

The laparoscopic hysterectomies have the shortest hospital stays and the lowest blood loss in comparison with abdominal and vaginal groups. Abdominal and vaginal hysterectomies are shorter, however, the duration of laparoscopic hysterectomies is becoming shorter annually. The complications' rates between groups do not differ significantly.

References

- [1] Drahonovsky J., Haakova L., Otcenasek M., Krofta L., Kucera E., Feyereisl J.: "A prospective randomized comparison of vaginal hysterectomy, laparoscopically assisted vaginal hysterectomy, and total laparoscopic hysterectomy in women with benign uterine disease". *Eur. J. Obstet. Gynecol. Reprod. Biol.*, 2010, 148, 172.
- [2] Rooney C., Crawford A., Vassallo B., Kleeman S., Karra M.: "Is previous cesarean section a risk for incidental cystotomy at the time of hysterectomy? A case-controlled study". *Am. J. Obstet. Gynecol.*, 2005, 193, 2041.
- [3] David-Montefiore E., Rouzier R., Chapron C., Daraï E.: "Surgical routes and complications of hysterectomy for benign disorders: a prospective observational study in French university hospitals". *Hum. Reprod. Oxf. Engl.*, 2007, 22, 260.
- [4] Reich H., DeCaprio J., McGlynn F.: "Laparoscopic hysterectomy". *J. Gynecol. Surg.*, 1989, 5, 213.
- [5] Kovac S.R.: "Route of hysterectomy: an evidence-based approach". *Clin. Obstet. Gynecol.*, 2014, 57, 58.
- [6] Wu J., Wechter M., Geller E., Nguyen T., Visco A.: "Hysterectomy Rates in the United States, 2003". *Obstet. Gynecol.*, 2007, 110, 1091.
- [7] Kovac S.: "Clinical opinion: guidelines for hysterectomy". *Am. J. Obstet. Gynecol.*, 2004, 191, 635.
- [8] Batra N., Tuffnell D.: "Vaginal hysterectomy". *Rev. Gynaecol. Pract.*, 2004, 4, 82.
- [9] Shin J., Lee H., Lee S., Park C.: "Total Laparoscopic Hysterectomy and Laparoscopy-Assisted Vaginal Hysterectomy". *JSLs*, 2011, 15, 218.
- [10] Johnson N., Barlow D., Lethaby A., Tavender E., Curr L., Garry R.: "Methods of hysterectomy: systematic review and meta-analysis of randomised controlled trials". *BMJ*, 2005, 330, 1478.
- [11] ACOG Committee Opinion No. 444: "Choosing the route of hysterectomy for benign disease". *Obstet. Gynecol.*, 2009, 114, 1156.
- [12] Candiani M., Izzo S., Bulfoni A., Riparini J., Ronzoni S., Marconi A.: "Laparoscopic vs vaginal hysterectomy for benign pathology". *Am. J. Obstet. Gynecol.*, 2009, 200, 361.
- [13] Chapron C.M., Dubuisson J.B., Ansquer Y.: "Is total laparoscopic hysterectomy a safe surgical procedure?" *Hum. Reprod. Oxf. Engl.*, 1996, 11, 2422.
- [14] Lundholm C., Forsgren C., Johansson A., Cnattingius S., Altman D.: "Hysterectomy on benign indications in Sweden 1987–2003: A nationwide trend analysis". *Acta Obstet. Gynecol. Scand.*, 2009, 88, 52.

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