

Vaginal Assisted Laparoscopic Hysterectomy

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The paper is a fragment of the clinical research conducted at the Obstetrics and Gynecology Department 1 of Azerbaijan Medical University «Specific Features of Reproductive Pathology in Young Girls and Women with Extra Genitalia Obstetrics and Gynecological Diseases», Registration number 0111AZ04061.

Introduction. In the second half of the twentieth century removal of the uterus became relatively safe surgical intervention. Due to experience accumulated to this time mortality at hysterectomy reduced to 0,1 %, and is explained by severe obstetrical complications and marked malignancies [1] rather than the operation itself. As a result new priorities were developed. They consisted in quality of life and mini-invasiveness and determined a search of alternative approaches particularly for patients with benign gynecological pathology [1,13]. So, several modifications of hysterectomy with resort to laparoscopy were proposed [4,13].

According to statistics, most of gynecologists prefer till to now «open» hysterectomy. This explained by the opinion that laparoscopic surgery is more complicated, takes longer time, causes more complications and has no advances in comparison to other methods of hysterectomy [2,7].

Methods. 62 patients with benign uterine pathology were operated by the same team at one of the hospitals were partially 1 st Department of Obstetrics and Gynecology of AMU is located. All of them underwent total hysterectomy: TAH (total abdominal hysterectomy) – 11 patients (17,7 %), TVH (total vaginal hysterectomy) – 24 patients (38,7 %) and with combination of vaginal and laparoscopic methods – 27 patients (43,5 %). Duration of operation, volume of blood loss and time of postoperative recovery were calculated and compared.

Choice of access depended on preoperational examination. Conditions for TVH were described in 1999 by the Society of Pelvic Reconstructive Surgeons (SPRS). They included capacious vagina, pathology confined to the uterus, uterus less than 12 weeks of gestation and its mobility. Laparoscopy was used when the uterus was not bigger than 16 weeks of gestation and on suspicion of involvement of other organs in pathologic process such as endometriosis or adhesions due to previous surgery) Beside with this combined method was preferred in absence of two and more conditions for TVH. TAH was performed in case of contraindications for both TVH and combined vaginal – laparoscopic method.

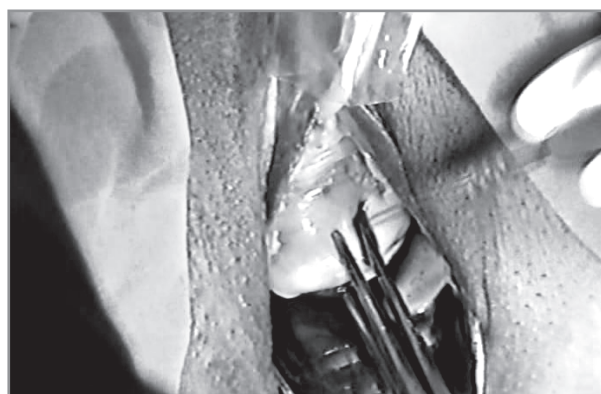
Preoperational tests beside routine examination included sonography, diagnostic curettage, and

screening for CA-125. In particular cases MRT were indicated before surgery. The volume of blood loss was determined by the amount of blood in suction reservoirs, duration of operation – from incision to last suture, postoperative recovery – by subjective feelings and transition to active regimen.

In the group of TVH were included patients without clinically expressed descensus. TAH was performed through lower transversal incision

Combination of laparoscopic and vaginal accesses was reached through two ways: LAVH (laparoscopic assisted vaginal hysterectomy) and VALH (vaginal assisted laparoscopic hysterectomy). LAVH was performed in 7 (11,2 %) patients and VALH in 20 (32,3 %) patients.

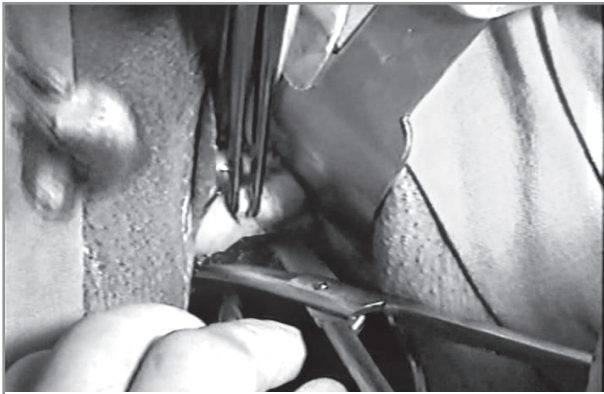
VALH started as TVH with excision of vaginal fornices around uterine cervix (**pic. 1**), separation of bladder



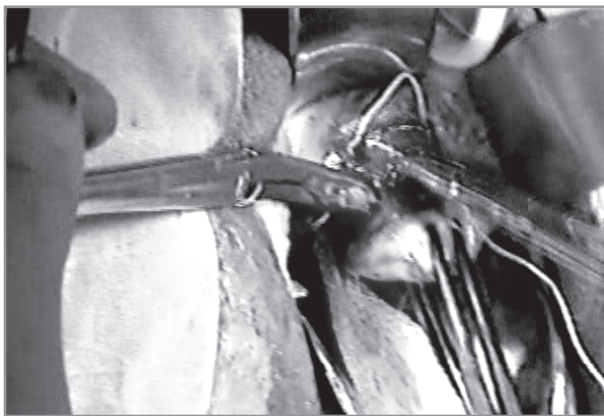
Pic. 1. Excision of vaginal fornices around uterine cervix.



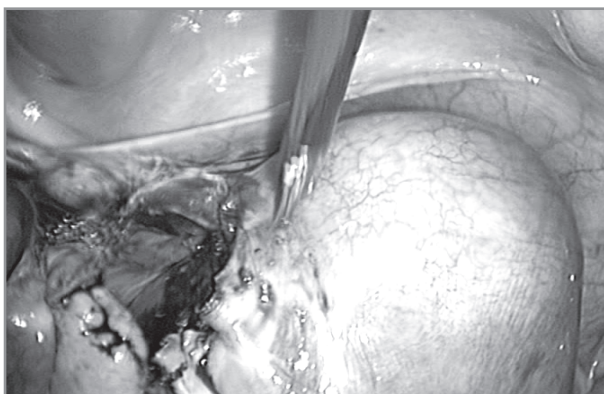
Pic. 2. Separation of bladder.



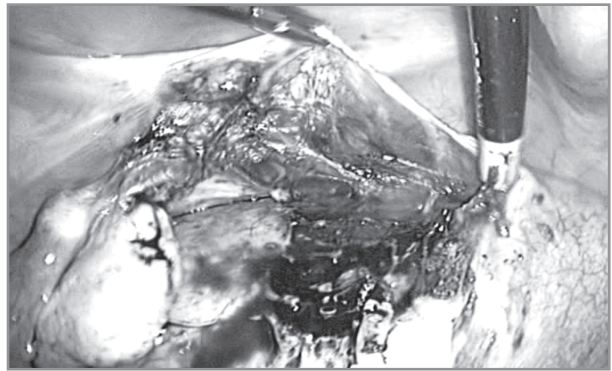
Pic. 3 and Pic. 4
Opening of abdominal posterior fornix cavity through.



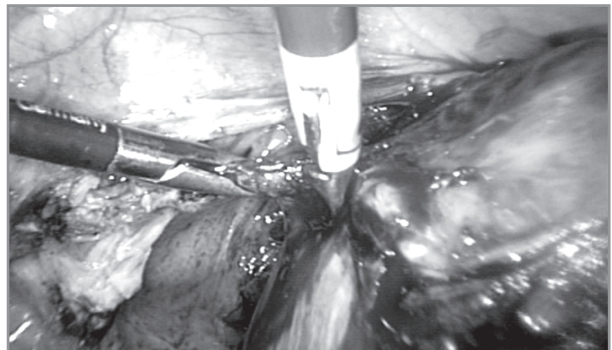
Pic. 5. Dissection of sacrouterine ligaments.



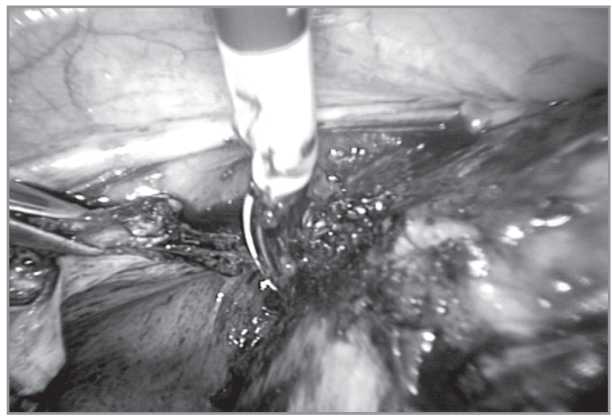
Pic. 6 Mobilisation of uterus.



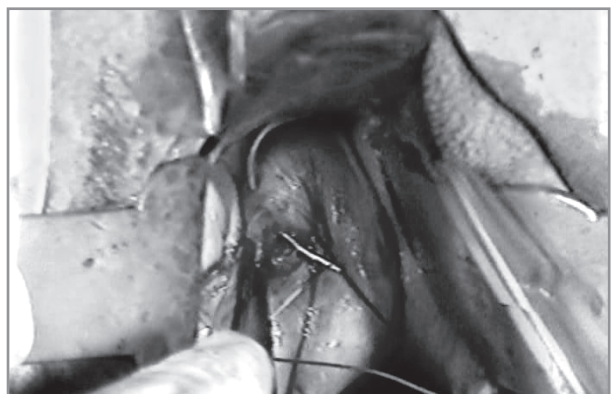
Pic. 7 Opening of vesicouterine pouch.



Pic. 8 Coagulation of uterine vessels.



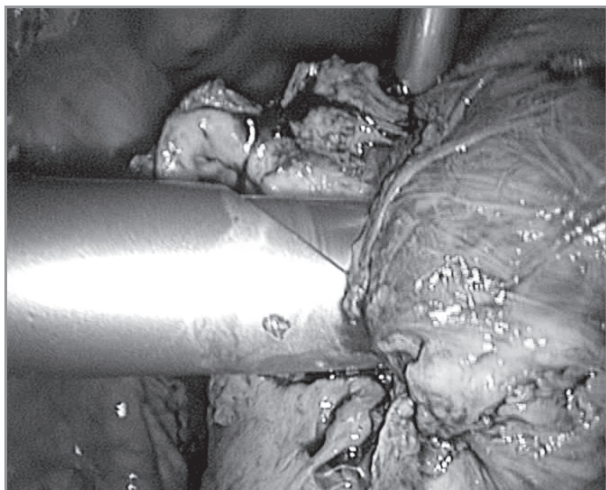
Pic. 9. Dissection of uterine vessels.



Pic. 10 Suturing of vaginal stump.

(**pic. 2**), opening of abdominal cavity through posterior fornix (**pic. 3, 4**), and dissection of sacrouterine ligaments (**pic. 5**).

The vagina was tightly plugged with tampons afterwards and second laparoscopic stage was started. Laparoscopic access was performed through 4 (in some cases 5) trocars and included uterine mobilisation (**pic. 6**), opening of vesicouterine pouch (**pic. 7**),



Pic. 11 Morcellation.



Pic. 12. Wertheim forceps.



Pic. 13. Breisky speculum.



Pic. 14. Rotating bipolar forceps and scissors («Storz», Germany).

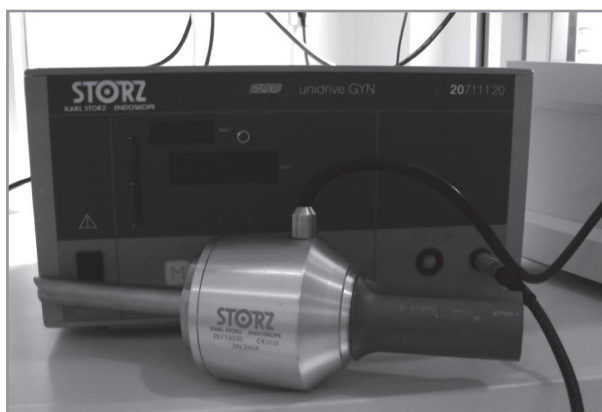
coagulation (**pic. 8**) and dissection of uterine vessels nepece (**pic. 9**).

The uterus was removed through vagina or through morcellation when it was too big (**pic 10**). Operation finished with hemostasis control and suturing of vagina (vaginally) (**pic. 11**).

It should be mentioned that special instruments and accessories are recommended to facilitate mode of surgery and transition from one access to another: Wertheim's clamps (**pic. 12**), Breisky speculas (**pic. 13**), bipolar clamps for laparoscopy (**pic. 14**), morcellator (**pic. 15, 16**) and boot-like leg holders (**pic. 17**).

Comparison and probabilistic estimate between quantitative values in study groups were done by non-parametric rank data analysis (U-test).

Results. Most of hysterectomy patients in our study were at the age of 41 – 60 years – 57 of 62 women



Pic. 15. Morcellator («Storz», Germany).

(91,9%). As it is seen on **diagram**, total hysterectomy performed more often in women ≤ 50 years – 41 (66,1%) patients. That is why mean age was $47,3 \pm 0,8$ years (**tabl. 1**).



Pic. 16. Morcellator ("Endomedium", Kazan).

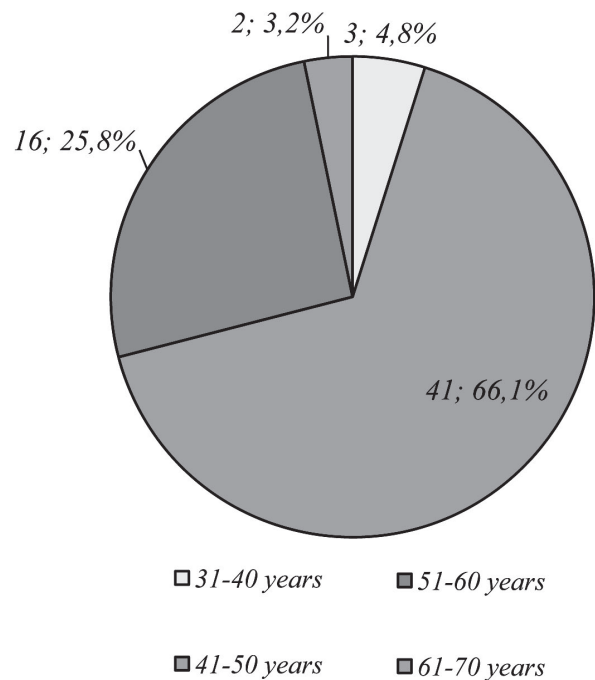


Diagram. Distribution of different hysterectomy methods in age groups.



Pic. 17. Special boot-like leg holders.

Table 1
Mean age of hysterectomy patients in our study

Route	VALH	LAVH	TVH	TAH	Total
Age	47,3±1,1 (39 – 59)	44,4±2,0 (34 – 51)	47,7±1,1 (40 – 66)	48,1±2,6 (31 – 65)	47,3±0,8 (31 – 66)

The main reasons for referring to hospital were uterine bleeding ($56,5 \pm 6,3\%$) and enlargement of uterus ($38,7 \pm 6,2\%$). In another $4,8 \pm 2,7\%$ cases indication for surgery was detection of pathologic masses in adnexa projection accompanied by CA-125 level increase. In these cases TAH was preferred (**tabl. 2**). VALH performed equally frequent in cases of uterine bleeding and uterine enlargement. In TVH and LAVH patients main complaint was uterine bleeding – 75% и 71,4%, correspondingly. The indications for TAH were very big uterus sizes (63,6%) and suspicion of ovarian tumor (27,3%) preferred (**tabl. 2**).

Previous surgery was registered in 36,4% of TAH, 28,6% of LAVH and 15,0% of VALH patients. Patients who underwent TVH had no history of previous surgery. Extragenital disorders such as cardiovascular diseases were relatively often in TAH group.

Table 2

Clinical characteristics of hysterectomy patients

Route	N	Data				
		Main indication (%)			Previous surgery (%)	Extragenital pathology (%)
		UE	UB	OT		
VALH	20	9 (45,0 %)	11 (55,0 %)	-	3 (15,0 %)	3 (15,0 %)
LAVH	7	2 (28,6 %)	5 (71,4 %)	-	2 (28,6 %)	-
TVH	24	6 (25,0 %)	18 (75,0 %)	-	-	7 (29,2 %)
TAH	11	7 (63,6 %)	1 (9,1 %)	3 (27,3 %)	4 (36,4 %)	4 (36,4 %)
Bcero	62	24 ($38,7 \pm 6,2\%$)	35 ($56,5 \pm 6,3\%$)	3 ($4,8 \pm 2,7\%$)	9 ($14,5 \pm 4,5\%$)	14 ($22,6 \pm 5,3\%$)

Note: UE – uterus enlargement; UB – uterine bleeding; OT – ovarian tumor + \uparrow CA-125; extragenital pathology – cardiac, vascular and gastrointestinal disturbance.

Table 3

Sizes of uterus and criteria of surgery effectiveness

Route	N	Comparison criteria					
		Sonographic size of uterus (mm)			BL (ml)	DO (min)	POR (days)
		Length	Width	Thickness			
VALH	20	83,1±5,7 (46 – 150)	73,6±4,4 (45 – 120)	62,2±3,7 (35 – 98)	171,0±11,3 (90 – 240)	114,5±4,1 (90 – 155)	1,80±0,14 (1 – 3)
LAVH	7	75,0±2,1 (68 – 81)	68,6±3,2 (58 – 85)	60,7±4,5 (46 – 85)	180,0±15,1 (120 – 240)	110,0±5,0 (100 – 135)	1,57±0,20 (1 – 2)
TVH	24	74,3±3,1 (46 – 113)	67,1±2,6 (32 – 89)	58,6±2,2 (30 – 77)	137,1±5,3 (100 – 220) **	70,2±2,6 (50 – 110) ***	1,04±0,04 (1 – 2) ***
TAH	11	100,7±11,9 (58 – 176)	85,5±8,8 (51 – 144)	69,6±7,4 (30 – 114)	215,5±9,0 (190 – 280) *	142,7±9,3 (110 – 210) **	2,55±0,25 (2 – 4) **
Total	62	81,9±3,2 (46 – 176)	72,6±2,4 (32 – 144)	62,0±2,0 (30 – 114)	166,8±5,9 (90 – 280)	101,9±4,2 (50 – 210)	1,61±0,10 (1 – 4)

Note: BL – intraoperative blood loss, DO – duration of operation, POR – postoperative recovery; significant difference with indices in VALH group: * – $p < 0,05$; ** – $p < 0,01$; *** – $p < 0,001$.

Table 4

Duration of operation for VALH and LAVH

Mode	Total duration of operation	Duration of different stages of operation			
		Vaginal stage	transition	Laparoscopic stage	Suturing of vagina
VALH	114,5±4,1 (90 – 155)	25,4±1,8 (10 – 40)	22,3±0,6 (20 – 25)	57,3±3,1 (40 – 90)	12,4±2,3 (8 – 55)
LAVH	110,0±5,0 (100 – 135)	45,7±3,0 (35 – 55) ***	26,4±1,8 (20 – 35) **	37,9±3,1 (30 – 55) **	45,7±3,0 (35 – 55) **

Note: significant difference with indices in VALH group: ** – $p < 0,01$; *** – $p < 0,001$.

Table 5

Volume of uterine (in gestation weeks) removed by various methods

Volume of uterus	N	Mode			
		VALH	LAVH	TVH	TAH
< 8 weeks	31	8 (28,8 %)	3 (9,7 %)	15 (48,4 %)	5 (16,1 %)
8 – 12 weeks	23	9 (39,1 %)	4 (17,4 %)	9 (39,1 %)	1 (4,3 %)
12 – 16 weeks	7	3 (42,9 %)	–	–	4 (57,1 %)
>16 weeks	1	–	–	–	1 (100,0 %)

In average the smallest sizes of uterus were observed in TVH group, the biggest – in TAH and VALH groups (**tabl. 3**).

For TVH patients less blood loss, shorter operational time and relatively quicker recovery was characteristic. The same criteria in VALH group were worse than in TVH but better than in TAH group. However, the size of uterus in VALH group was larger than in TVH group (**tabl. 4**). There were no expressed difference between VALH and LAVH except the uterine sizes (**tabl. 3, 4**).

Only in one case the size of uterus was larger than 16 weeks of gestation (1,6%). This patient was operated traditionally through incision of anterior abdominal wall. Relatively big sizes of uterus (12 – 16 weeks of gestation) were documented in 7 patients. 4 of them (6,5%) underwent TAH and 3 (4,8%) – VALH (**tabl. 5**).

It could be concluded from tab. 6 that rejection of TVH was influenced by necessity of simultaneous removal of adnexa. Either combined methods or TAH were preferred when adhesions were suspected (**tabl. 6**).

Discussion. In specialized literature there are several methods of hysterectomy with the use of endoscopic technique [4,13]. Fundamental difference between them is an extent of laparoscopic activity which reflects the stages of evolution of laparoscopy in gynecology and represents consecutive transition from vaginal to total laparoscopic hysterectomy [13].

Existing of several methods means that each of them has its advocates and opponents. Its clear, that TVH, when it is chosen in compliance with the guideline recommended by the Society of Pelvic Reconstructive Surgeons (SPRS) in 1999 is more fit for both

Table 6

Additional surgical activity during hysterectomy

Route	Additional surgical activity						
	AE	OR	TE	ER	CHE	Adhesiotomy	TVT
VALH (n=20)	14 (70,0 %)	1 (5,0 %)	-	-	1 (5,0 %)	5 (25,0 %)	1 (5 %)
LAVH (n=7)	3 (42,9 %)	2 (28,6 %)	-	-	-	1 (14,3 %)	-
TVH (n=24)	7 (29,2 %)	1 (4,2 %)	1 (4,2 %)	-	-	-	-
TAH (n=11)	11 (100 %)	-	-	3 (27,3 %)	-	5 (45,5 %)	-
Total (n=62)	35 (56,5±6,3 %)	4 (6,5±3,1 %)	1 (1,6±1,6 %)	3 (4,8±2,7 %)	1 (1,6±1,6 %)	11 (17,7±4,9 %)	1 (1,6±1,6 %)

Note: AE –removal of adnexa, OR – ovarian resection, TE – tubectomy, ER – epiploon resection, CHE – cholecystectomy, TVT – tension free vaginal tape insertion).

medical or economical reasons [9]. However, choice of TVH implies, above all, that pathologic process is confined to uterus [8].

There are certain accepted disadvantages of TVH which include restricted access, causing technical difficulties at larger sizes of uterus or necessity to remove adnexa, and impossibility of inspection of abdominal cavity. And if the former can be surmounted by perfection of practical skills [3,5,8,9,11,12,14,15], the latter makes combination with laparoscopy indispensable. In our opinion documentation of status quo or revealed pathologic changes is an indisputable advantage of laparoscopic component which tips the scales in favor of its combined use in comparison to TVH alone.

Our group is engaged in endometriosis study in Azerbaijan, and the experience, that we've gained in process, shows that visual diagnostics (TVS and MRT) is unable to diagnose in full measure the extent of endometrial disease in pelvic cavity. Particularly, this is important at the choice of the route of hysterectomy for patients with adenomyosis, taking into consideration that it is frequently associated with pelvic endometriosis.

We recognize that TVH requires less time and as surgical operation is less traumatic, which means quicker postoperative recovery [6,10]. Detection of all existing endometriosis foci during TVH, as well as TAH, though for different reasons, is difficult. VALH could be considered, on the one hand, as expansion of TAH, which makes possible detailed inspection of pelvic/abdominal cavity. On the other hand, main stages of operation at VALH in contrast to LAVH are done laparoscopically, but not vaginally. Uterine vessels can be dissected laparoscopically in case of large but mobile uterus at VALH without even separation of ureter, since uterus is found to be slung between round and broad ligaments of both sides after ectomy of cardinal complex.

Beside with this, step by step application of laparoscopic hysterectomy to wide medical practice seems to be efficient because of absence of special training program in gynecological laparoscopy in our country. Such combination of surgical accesses allows to perfect skills in performing both laparoscopic and vaginal operations.

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ВАГІНАЛЬНІ ЛАПАРОСКОПІЧНІ ГІСТЕРЕКТОМІЇ

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Резюме. Вагінальні лапароскопічні гістеректомії (ВЛГ) порівнювали з іншими методами видалення матки. Було показано, що при повній вагінальній гістеректомії (ПВГ) спостерігається менша втрата крові, коротший час операції і відносно швидке відновлення, що відповідає правилам Суспільства Тазових Реконструктивних хірургів (СТРХ). Поєднання з лапароскопією було ефективнішим в цьому відношенні, ніж повна абдомінальна гістеректомія (ПАГ). Перевага використання лапароскопії в порівнянні з ПВГ, перш за все полягає в кращій візуалізації, детальному огляді органів черевної порожнини, реєстрації і документуванню виявлених змін, особливо в тих випадках, коли патологія не зводиться до матки.

Ключові слова: гістеректомія, маткові кровотечі, збільшення матки, аденоміоз, ендометріоз тазовий.

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ВАГИНАЛЬНЫЕ ЛАПАРОСКОПИЧЕСКИЕ ГИСТЕРЭКТОМИИ

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Резюме. Вагинальные лапароскопические гистерэктомии (ВЛГ) сравнивали с другими методами удаления матки. Было показано, что при полной влагалищной гистерэктомии (ПВГ) наблюдается меньшая потеря крови, короче время операции и относительно быстрое восстановление, что соответствует правилам Общества Тазовых Реконструктивных хирургов (ОТРХ). Сочетание с лапароскопией было более эффективным в этом отношении, чем полная абдоминальная гистерэктомия (ПАГ). Преимущество использования лапароскопии по сравнению с ПВГ, прежде всего, состоит в лучшей визуализации, детальном осмотре органов брюшной полости, регистрации и документирования выявленных изменений особенно в тех случаях, когда патология не сводится к матке.

Ключевые слова: гистерэктомия, маточные кровотечения, увеличение матки, аденомиоз, эндометриоз тазовый.

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Vaginal Assisted Laparoscopic Hysterectomy

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Summary. Vaginal assisted laparoscopic hysterectomy (VALH) was compared with other methods of uterus removal. It was shown that total vaginal hysterectomy (TVH) was associated with less blood loss, shorter operational time and relatively quicker recovery when the guidelines of the Society of Pelvic Reconstructive Surgeons (SPRS) was followed. Combination with laparoscopy was more effective in this regard than total abdominal hysterectomy (TAH). The advantage of laparoscopy use in comparison to TVH first of all consisted of better visualization, detailed inspection of abdominal cavity, registration and documentation of revealed changes specially in cases when pathology is not confined to uterus.

Key words: hysterectomy, terine bleeding, uterine enlargement, adenomyosis, pelvic endometriosis.

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