

Laparoscopic-assisted vaginal hysterectomy: a low-complication hysterectomy

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Abstract

Object To determine the safety of laparoscopic-assisted vaginal (LAVH) in a district general hospital.

Design Retrospective analysis.

Setting District general hospital in the UK.

Subjects A total of 119 LAVH patients, who were unsuitable for vaginal hysterectomy according to conventional British criteria.

Result The mean operating time taken was 91 min. Mean duration of stay was 2.2 days. The overall complication rate was 7.5%; most complications were of a minor nature.

Conclusions We feel that in experienced hands LAVH is a safe procedure and, within our indications, is the hysterectomy method of choice in the district hospital setting.

Keywords: complications, hospital stay, laparoscopic-assisted vaginal hysterectomy.

The author performed 119 laparoscopic assisted vaginal hysterectomies in a conventional district general hospital setting. The cases were unsuitable for vaginal hysterectomy according to British criteria and would have been performed by the abdominal route. A stapling device was used to divide and seal the infundibulopelvic ligament (or upper pedicle of the uterus if the ovaries were conserved). The bladder was not reflected and the uterine artery was not divided laparoscopically. Mean operating time was 91 min. Mean duration of hospital stay was 2.2 days. The overall complication rate was 7.5%, most complications were of a minor nature.

Introduction

Although it is well known that vaginal hysterectomy is accompanied by earlier recovery and fewer post-operative complications than abdominal hysterectomies (24.5 vs. 42.8%,¹ 15 vs. 22.1%²). 88% of all hysterectomies in the UK before 1992 were performed abdominally.³ Reich *et al.*^{4–6} have described an alternative approach laparoscopic-assisted vaginal hysterectomy (LAVH) which aims to make possible the removal of the uterus and

appendages by the vaginal route in cases hitherto only considered for the abdominal approach. Numerous articles have been published suggesting the benefit of laparoscopic hysterectomies over the abdominal route, due to fewer complications, less blood loss, decreased hospital stay and quick return to work.^{4–7} However, there is some controversy over whether LAVH offers advantages over vaginal hysterectomy in terms of time taken for the procedure, postoperative comfort, recovery period and length of hospitalization.^{8,9} This has led some to question its advantages compared with conventional vaginal hysterectomy. This raises the question of why, if a vaginal procedure is a simple alternative to an abdominal hysterectomy, the operation is so unpopular in the UK.

We believe that the laparoscopic approach, by enabling a thorough pelvic inspection, has the potential to reduce complications. Unsuspected pathology such as adhesions or endometriosis can be dealt with, ovaries are easily removed and pelvic oozing can be controlled and blood clots removed. In spite of all these known advantages and the low complication rate of LAVH, there have been a number of well-publicized problems resulting, perhaps, from the hasty and uncritical introduction of the technique.

Subjects and methods

Women presenting to the author in a general gynaecology clinic and having indications for hysterectomy with or without salpingo-oophorectomy were offered LAVH. A uterine size more than 13–14 weeks, multiple Caesarean section and ovarian mass with suspected malignancy were considered absolute contraindications. Prolapsed uterus was also excluded. No randomization was attempted.

There was a full discussion of the procedure, with regard to stay in hospital, need for analgesia, post-operative recovery, home support and complications. An information sheet, which included a brief description of the operation technique and post-operative advice, was given to all patients.

The operations were all performed by the author, assisted by junior doctors.

Operative technique

General anaesthesia, using muscle relaxants and

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endotracheal intubation with artificial ventilation was employed for all cases.

The patients were placed in the Trendelenberg position. A carbon dioxide pneumoperitoneum was created in the routine way using a Veress needle.

Three entry ports were used. A 10-mm subumbilical port was used to introduce the laparoscope, and 12-mm ports were placed high up in both iliac fossae under laparoscopic control, step-down adaptors being used if necessary.

After a preliminary visual examination, any adhesions were divided. When salpingo-oophorectomy was to be performed, the infundibulopelvic ligament and round ligament were taken together and divided and sealed as close to the ovary as possible, using an endoscopic stapling device (Endo-GIA 30 with 2.5-mm closure height staples). If the ovary was to be conserved, the round ligament, fallopian tube and ovarian ligament were taken together with a single stapling cartridge as close as possible to the uterus. Pedicle sizes were not measured. A single cartridge was used on each side, further dissection being undertaken with bipolar diathermy and endoscopic scissors. Dissection was taken to the point of opening the broad ligament. No attempt was made to divide the uterovesical fold of peritoneum and reflect the bladder or to ligate the uterine arteries laparoscopically.

The operation was completed by the vaginal route, using a standard technique. On completion the pneumoperitoneum was re-established and a laparoscopic

inspection of the pelvis carried out. Any bleeding points were diathermised. The pelvic cavity washed out with warm saline using a suction/irrigation device, and 300–400 ml of saline were left in the pelvic cavity. Initially the 12-mm port sites were not closed but since the author encountered the complication of Richters' hernia, these ports are routinely closed using a needle-point suture-passer. A gauze vaginal pack and a Foley's catheter, both of which remained *in situ* overnight, were inserted at the end of the procedure.

All patients received 100 mg diclofenac rectally, either pre- or intraoperatively and parenteral morphine or pethidine was given in the immediate postoperative period (usually in the recovery room) if required. Thereafter oral analgesia was employed as the patients were able to start sipping fluids within a few hours. All patients had three doses of antibiotic (usually Augmentin) with the first dose given at induction of anaesthesia. All patients had their haemoglobin measured on the second postoperative day.

Results

During the early days one case was converted to an open procedure because of failure of the diathermy equipment. This patient had no complication. All other procedures were completed as planned. The mean operating time was 91 min (range 60–180).

The average postoperative stay was 2.2 days. The majority of patients stayed 2 days, 11 stayed three

Case nos.	Total postoperative stay, days	Average stay, days	Stay >2 days*	
			Case no.	Length of stay, days
1–10	31	3.1	1	3
			2	6
			3	3
			7	7
11–20	23	2.3	12	3
			15	3
			16	3
21–30	20	2.0		
31–40	20	2.0		
41–50	21	2.1	50	3
51–60	20	2.0		
61–70	20	2.0	72	3
71–80	22	2.2	78	3
81–90	21	2.1	89	3
91–100	24	2.4	94	3
			95	3
			96	4
101–110	20	2.00		
111–119	18	2.00		
Total	260	2.18		

Table 1 Chronology of postoperative hospital stay for laparoscopic-assisted vaginal hysterectomy (LAVH)

*Most of the patients who stayed over 2 days did so for social reasons.

Table 2 Chronology of complications

Case nos.	Number of complications	Type	
		Case no.	Complications
1–10	3	1	Vault granulation
		2	Abdominal wall bruising (heparin used), blood transfusion, 6-day stay; complaints of dysuria at 6 weeks
		7	Oozing from clip site (faulty clip confirmed by autosuture), laparotomy, blood transfusion, 7-day stay; readmission for fever for 3 days. Vault granulation at 6 weeks
11–20	Nil		
21–30	Nil		
31–40	Nil		
41–50	1	50	Abdominal wall bruising + haematoma (heparin used), blood transfusion, 3-day stay
51–60	1	55	Vault granulation tissue
61–70	1	62	Vault granulation tissue
		70	Vault granulation tissue
71–80	Nil		
81–90	Nil		
91–100	1	96	Readmitted for non-strangulated Richters' hernia, corrective surgery. Vault granulation tissue at 6 weeks
101–110	1	104	Vault granulation tissue
110–119	Nil		

Total cases = 119; total complications = 9; % = 7.5.

days (case nos. 1, 3, 12, 15, 16, 50, 72, 78, 89, 94, 95) and three others (case nos. 2, 7, 96) for 6, 7 and 4 days respectively (see Table 1). Most patients who stayed over 2 days did so for social reasons.

Complications

Case no. 7 had to undergo laparotomy 6 h after the operation due to intraperitoneal blood loss. Generalized oozing from one of the clipped pedicles was found. The patient needed 4 units of blood transfusion and stayed in hospital for 7 days. The remains of the stapling device was returned to the manufacturer (United States Surgical Corporation) and was found to be faulty. The report suggested 'weld on the cover of the tube of the instrument was weak and jaws did not close fully'. Modifications to this assembly process have been implemented. Another

case (no. 96) was readmitted for Richters' hernia of the small bowel (non-strangulated) and had to undergo corrective operation. The 12-mm port sites are now routinely closed (see Table 2).

Two patients had bruising and haematoma of the abdominal wall, which was sufficient to prolong their hospital stay (cases nos. 2 and 50 stayed for 6 days and 3 days respectively) and requiring blood transfusion. This may have been associated with heparin given to both patients for deep-vein thrombosis prophylaxis. With conservative treatment, recovery was complete. No other patients required blood transfusion.

Complications at 6 weeks

These were of a minor nature. Case no. 2 complained of dysuria and was treated with antibiotics.

Table 3 Readmissions after LAVH, out of 119 cases

	Readmissions		Reason
	n	%	
Operative complication	2	1.6	Fever (case no. 7) Richters hernia (case no. 96)
Other reasons (mainly apprehension and anxiety due to new procedure)	3	2.5	Headache and constipation; 24-h stay (case no. 31) Wind pain, midnight to next a.m.; 12-h stay (case no. 37) Generalized body rash and loose motion, allergy to lactulose; 48-h stay (case no. 62)

Case nos. 1, 7, 55, 62, 70, 96 and 104 had vault granulation tissue which was cauterized as an out-patient procedure using silver nitrate (see Table 2).

Readmission

There were only two readmissions for operative complications. Case no. 7 was readmitted for fever. The patient stayed in hospital for 3 days only, and was treated with antibiotics. The other case was readmitted for non-strangulated Richters' hernia and had corrective surgery.

There were three further readmissions, mainly due to apprehension and anxiety about 'keyhole' surgery. These patients referred themselves. Case no. 31 was admitted for headache and constipation and was discharged within 24 h. Case no. 37 was admitted at midnight due to wind pain and discharged within 12 h, and case no. 62 was admitted because of generalized body rash and loose motion, due to lactulose allergy. She went home in 48 h (see Table 3).

Discussion

Whenever a newer procedure replaces a long-established one, it is right that its safety should be rigorously monitored. Unfortunately the publicity given by the media to isolated cases, without reference to the experience of the surgeon, the overall outcome or the results of the older technique, may give a false impression.

Complication rates of over 40% have been reported for abdominal hysterectomy^{1, 10-13} and rates of 15 and 24.5%^{1, 2} for the vaginal approach. Rates of 13-18% have been reported for LAVH^{4-6, 10, 14} while an analysis of 29 studies by Garry & Phillips¹⁵ produced an overall complication rate of 15.6% (see Table 4). It appears that LAVH has a lower rate of complication than abdominal or vaginal hysterectomy. This is possibly because LAVH combines the advantages of the abdominal and vaginal approach, without the well-known disadvantages of a large abdominal wound.

LAVH complements the vaginal hysterectomy with proper inspection of the pelvis with magnification;

aids dealing with unsuspected pelvic pathology, e.g. adhesions, endometriosis and adnexal cysts; helps in easy removal of ovaries; helps to further reduce the complications of vaginal hysterectomy such as unsuspected vault bleeding and clot in the pouch of Douglas, and finally it makes the vaginal route possible for more hysterectomies, where adnexal mass, severe endometriosis and adhesions are well known preoperatively.

As the main support of the uterus is the cardinal and uterosacral ligaments, dissection of the bladder and laparoscopic division of the uterine arteries cannot contribute to downward mobilization. However, these procedures increase operating time and risk urinary tract injury and pelvic haematoma. We are convinced that a policy of doing the minimum necessary laparoscopically and paying meticulous attention to haemostasis has produced a technique which, in experienced hands, is safe and virtually complication-free. In our study only nine complications, most of a minor nature and amounting to a 7.5% complication rate, were encountered as a result of adopting the above policy. On analysing these complications further, it is apparent that, apart from one laparotomy during the early days for a bleeding pedicle due to faulty clip, corrective surgery for non-strangulated Richters' hernia, and two cases of abdominal wall bruising/haematoma in patients receiving heparin who responded to conservative treatment, the only complications were vault granulation tissue which was dealt with as an out-patient procedure with silver nitrate cautery.

Despite one failure, the use of endoscopic staplers certainly facilitates the procedure, allowing both a shorter operating time and better haemostasis.

There is widespread support for the use of a laparoscopic approach when the ovaries are to be removed. The author feels that even if they are to be conserved, the use of the laparoscope is of great value. It provides the chance to fully assess and deal with unsuspected pelvic pathology and also deal with the surprising amount of vault oozing and haematoma that undoubtedly contribute to postoperative problems. The laparoscopic-assisted approach also helps to make more hysterectomies possible

Type of hysterectomy	Author's complication rate	Published complication rates			
		1995	1994	1993	1982
Total abdominal	—		47.0 ¹⁰	47.0 ^{11, 12}	42.8 ¹
Vaginal	—			15.0 ²	24.5 ¹
Laparoscopic-assisted vaginal	7.5	15.6 ¹⁵	18.0 ¹⁰	13.0 ⁴⁻⁶	

Table 4 Comparison of overall complication rates for hysterectomy (rate per 100 women undergoing hysterectomy)

The complication rate for LAVH is less than for vaginal hysterectomy and abdominal hysterectomy.

by vaginal route, where adnexal masses, severe endometriosis and adhesions are known about preoperatively.

I feel that in experienced hands LAVH is a safe procedure and, within our indications, it is the hysterectomy of choice in the district hospital setting.

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References

- 1 Dicker RC, Greenspan JR, Strauss LT *et al.* Complications of abdominal and vaginal hysterectomy among women of reproductive age in the United States. *American Journal of Obstetrics and Gynecology* 1982; **144**: 841–8.
- 2 Raatz D. The vaginal hysterectomy. *Gynaecological Endoscopy* 1993; **2**: 85–7.
- 3 Vessey MP, Villard-Mackintosh L, McPherson K, Coulter A, Yeates D. The epidemiology of hysterectomy findings in a large cohort study. *British Journal of Obstetrics and Gynaecology* 1992; **99**: 402–7.
- 4 Reich H. Laparoscopic hysterectomy. *Surgical Laparoscopy and Endoscopy* 1992; **2**: 85–8.
- 5 Reich H, De Carpio J, McGlynn F. Laparoscopic hysterectomy. *Journal of Gynecological Surgery* 1989; **5**: 213–16.
- 6 Reich H, McGlynn F, Sekel L. Total laparoscopic hysterectomy. *Gynaecological Endoscopy* 1993; **2**: 59–63.
- 7 Liu CY. Laparoscopic hysterectomy report of 215 cases. *Gynaecological Endoscopy* 1992; **1**: 73–7.
- 8 Stovall TG, Summitt RL, Bran DF, Ling FW. Outpatient vaginal hysterectomy: a pilot study. *Obstetrics and Gynecology* 1992; **80**: 143–50.
- 9 Summitt RL Jr, Stovall TG, Lipscomb GH, Ling FW. Randomised comparison of laparoscopic-assisted vaginal hysterectomy versus standard vaginal hysterectomy in an outpatient setting. *OB/GYN July* 1992, p4. *Obstetrics and Gynecology*; **80**: 895–901.
- 10 Hildebaugh D, O'Mara P, Conboy E. Clinical and financial analyses of laparoscopic-assisted vaginal hysterectomy. *Journal of the American Association of Gynecologic Laparoscopists* 1994; **1**: 357–64.
- 11 Dwyer N, Hutton J, Stirrat G. Randomised controlled trial comparing endometrial resection with abdominal hysterectomy for the surgical treatment of menorrhagia. *British Journal of Obstetrics and Gynaecology* 1993; **100**: 237–43.
- 12 Sculpher MJ, Bryan S, Dwyer N, Hutton J, Stirrat GM. An economic evaluation of transcervical endometrial resection vs. abdominal hysterectomy for the treatment of menorrhagia. *British Journal of Obstetrics and Gynaecology* 1993; **100**: 244–52.
- 13 Pinon S, Parkin D, Abramovich D, *et al.* Randomised trial of hysterectomy, endometrial laser ablation and transcervical endometrial resection for dysfunctional uterine bleeding. *British Medical Journal* 1994; **309**: 979–83.
- 14 Wood C, Maher P, Hill D, Lolatgis N. Laparoscopic hysterectomy. *Australian and New Zealand Journal of Obstetrics and Gynaecology* 1994; **34**: 81–8.
- 15 Garry R, Phillips G. How safe is the laparoscopic approach to hysterectomy? *Gynaecological Endoscopy* 1995; **4**: 77–9.