Hysterectomy: towards an overnight stay

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ABSTRACT

Objective To review the introduction of an overnight stay laparoscopically assisted vaginal hysterectomy (LAVH) service in a district general hospital.
Design A retrospective study.
Setting Dewsbury District Hospital is a 478-bedded district general hospital with 14 gynaecological inpatient beds, serving a population of 165 000.
Data collection Included in the study were 265 consecutive patients who underwent LAVH, performed by one consultant between September 1995 and September 2000. These patients were unsuitable for vaginal hysterectomy according to conventional (British) criteria and in the past would be have been offered abdominal hysterectomy. The names of the patients were obtained from the hospital register. All operative notes were abstracted and data collected independently by junior medical staff working in the department.
Results Postoperative stay was analysed for consecutive groups of 50 patients. Initially the median postoperative stay was 2 nights but by the last cohort, nine out of 10 patients were going home after only 1 night's postoperative stay. None of the patients were readmitted or suffered complications as a result of this policy. Among the patients, 4.5% suffered one or more complications (most were minor). No patient suffered visceral injury. Patients had full surgical recovery by 6 weeks after operation except for a few who developed granulation tissue which needed topical treatment.
Conclusion In experienced hands LAVH has few complications, and it is acceptable and safe to discharge patients home after an overnight hospital stay provided strict guidelines are followed.

INTRODUCTION

Hysterectomy is the second most frequently performed major surgical procedure (after Caesarean section) among women of reproductive age.[1] It is one of the commonest elective surgical procedures: by 50 years of age, 20% of UK women have undergone hysterectomy,[2] and one in three women in the United States by 60 years of age.[3] Most of these hysterectomies are performed abdominally. The first report of laparoscopically assisted vaginal hysterectomy (LAVH) appeared in 1989.[4] In recent years there has been some controversy over the use of LAVH in patients who could be treated with conventional vaginal hysterectomy; however, patients presenting with possible adhesions, endometriosis, an excessively large uterus or potential tumours and cysts are considered poor candidates for traditional vaginal hysterectomy. Despite the obvious advantages of avoiding an abdominal incision, in most centres, the abdominal route is most commonly used.

Although vaginal hysterectomy can produce excellent results in experienced hands, it does not allow the facility to precisely define and deal with associated pathology. LAVH has this capability and our aim is to perform a procedure with a low complication rate and, for economic and social reasons, a short period of hospitalization.

My initial hypothesis was that patients who had undergone LAVH could possibly be discharged considerably earlier than was the norm for hysterectomies in our

Table 1 Patient characteristics and outcome in five successive groups of patients. 'Overnight stay' hysterectomy was gradually introduced from the third group onwards

Parameter	Patient nos					Total patient group $n = 265$		
	1–50 ($n = 50$)	51–100 ($n = 50$)	101–150 ($n = 50$)	151–200 ($n = 50$)	201–265 ($n = 65$)	Mean	Range	SD
Mean age, years	42	44	44	43	43	43	27–63	7.1
Mean weight, kg	68	70	69	69	70	69	43–134	14.13
Mean uterine weight, g	157	158	138	175	136	153	47–500	79.8
Previous LSCS, *n* (%)	0 (0)	2 (4)	5 (10)	5 (10)	9 (16.9)	23 (8.7)		
Mean operating time, min	94	93	98	97	109	98	55–205	30.3
Mean haemoglobin deficit, g%	1.7	1.86	1.9	1.9	1.9	1.85	0.1–5.5	
Abnormal histology, % of patients	62	80	76	88	83	77		
Conversion to TAH, *n* (%)	0 (0)	0 (0)	1 (2)	0 (0)	0 (0)	1 (0.38)		
Readmission, *n* (%)	2 (4)	2 (4)	1 (2)	0 (0)	0 (0)	5 (1.88)		
Reoperation, *n* (%)	1 (0.5)	1 (0.5)	0 (0%)	1 (0.5)	0 (0)	3 (1.13)		
Total complications (including conversion, readmission and reoperation), *n* (%)	3 (6)	3 (6)	3 (6)	3 (6)	0 (0)	12 (4.5)		

LSCS, lower segment Caesarean section; TAH, total abdominal hysterectomy.

hospital. As experience developed, it seemed that a postoperative stay of 1 night only was achievable and safe. I also wished to compare complications from LAVH with reported complications of other types of hysterectomy, i.e. abdominal and vaginal.

SUBJECTS AND METHODS

A retrospective audit, in September 2001, of the records of 265 consecutive women who underwent LAVH performed by the author was undertaken. It was not a controlled trial. All patients presenting in a general gynaecology clinic with indications for hysterectomy with or without salpingo-oöphorectomy were offered the procedure unless they had a uterine size of greater than 18 weeks, endometrial or ovarian carcinoma or prolapse. (Four women were subsequently found to have endometrial carcinoma after initial diagnosis of atypical hyperplasia.) Various parameters, which included type of operation, age, weight, uterine weight, operating time, conversion to abdominal procedure, hospital stay, readmission, histological findings and complications, were recorded. Age (maximum 63 years; Table 1), obesity (maximum weight 134 kg, body mass index 52; Table 1), increased uterine size (maximum weight 500 g; Table 1), previous Caesarean section (8.7%; Table 1) or abnormal extrauterine pathology (63.4% of patients required additional procedures) were not regarded as contraindications. The type and complexity of cases were no different from those described in previously published papers on LAVH.

Data were analysed using SPSS (version 10).

The patients were fully counselled about the procedure with regard to stay in hospital, need for analgesia, postoperative recovery, home support and complications. An information sheet, which included a brief description of the operation technique and postoperative advice, was given to all patients.

Patients were admitted to the hospital on the day of the operation for afternoon sessions and on the previous evening for the morning sessions. (This was simply for convenience: to avoid travelling early in the morning and to secure a bed on our small and busy ward.) All the operations were carried out by the author assisted by junior doctors.

Three entry ports were used: a 10-mm subumbilical port for the laparoscope and 2×12-mm ports laterally for instrumentation. After a preliminary visual examination, pelvic pathology was suitably dealt with: any adhesions were divided and endometriosis excised; ovarian cysts were treated by cystectomy or oöphorectomy, and salpingectomy was performed for tubal disease if appropriate.

When salpingo-oöphorectomy 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 GIA45 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.

A single stapling cartridge was used on each side, further dissection being undertaken with bipolar diathermy and endoscopic scissors. Dissection was taken to the point of the base of 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 with two modifications. First the pouch of Douglas was opened by incising the posterior lip of the cervix in the midline, thus enabling easier entry into the pouch of Douglas. Secondly, the uterine fundus was delivered through the pouch of Douglas after ligation of the uterine vessels.

On completion of the vaginal component, the pneumoperitoneum was re-established and a laparoscopic inspection of the pelvis carried out at an intra-abdominal pressure below capillary pressure, usually 6–8 mmHg. Any bleeding points were cauterized with bipolar forceps. The pelvic cavity was washed out with warm saline mixed with heparin using a suction/irrigation device, and 300–500 mL of heparinized saline were left in the pelvic cavity. Initially the 12-mm port sites were not closed, but after the author encountered the complication of Richter's hernia, these ports were routinely closed using a needle-point suture passer (Carter–Thomason), and 20–40 mL 0.25% bupivacaine was injected subcutaneously around the three incisions. A Foley catheter was inserted at the end of the procedure and remained *in situ* overnight.

All patients received 100 mg diclofenac and 1000 mg paracetamol rectally at the end of the operation. One dose of parental morphine or pethidine was given in the immediate postoperative period (usually in the recovery room). All patients received regular diclofenac slow release (SR) 75 mg twice daily and 1000 mg paracetamol four times daily for the first 5 days. All patients received three doses of intravenous prophylactic antibiotics, i.e. metronidazole and co-amoxiclav or cefuroxime. Patients with a high risk of thrombosis received prophylaxis against deep vein thrombosis with dalteparin sodium (2–3 doses), the last dose being given on the day of discharge.

Initially patients were discharged home after a hospital stay of 2 nights, but as clinical experience increased the majority of patients were discharged home the following day, provided the home conditions were suitable. At this stage the women were fully mobile on the ward, passing urine normally and taking food; pain was under control with simple analgesics. Haemoglobin was checked prior to discharge.

On the second postoperative day a district nurse visited patients at home, and on the third postoperative day the patient attended the gynaecology clinic or the ward. A further clinic appointment was arranged for 1 week later and a final appointment for 6–8 weeks postoperatively.

Special care was taken to ensure that all LAVH patients had a contact phone number to use in case of any problems, and arrangements were put in place for easy readmission if required.

Table 2 Histological diagnoses

	n	%
Leiomyomata	79	29.8
Normal histology	60	22.6
Adenomyosis	35	13.2
Endometriosis	29	10.9
Leiomyomata ± adenomyosis ± endometriosis	30	11.4
Endometrial hyperplasia ± atypia ± complex	8	3.0
Benign ovarian cyst	8	3.0
Endometrial carcinoma	4	1.5
Cervical intraepithelial neoplasia	2	0.8
Miscellaneous (e.g. endometritis, polyp, inflammation, etc)	10	3.8
Total	265	100.0

RESULTS

The type and complexity of cases included in this series are comparable to those of previously published studies of LAVH (see Tables 1 and 2). Various parameters and results, including type of operation, age, weight, uterine weight, operating time, conversion to abdominal approach, hospital stay, readmission, histological findings and complications are summarized in Tables 1–4.

An 'overnight hospital stay' policy was gradually introduced, and a total of 117 patients have been discharged after an overnight stay since this policy was adopted. Currently nine out of 10 patients are discharged home after a postoperative stay of a single night at the hospital (see Table 3). Patients who stay an extra night do so purely for social and family reasons, and no patient in this group has been readmitted since the introduction of this policy [see Table 1].

Among the patients, 4.5% suffered one or more complications (see Table 4). There were no internal organ injuries (see Table 4).

DISCUSSION

Over the last decade there has been considerable interest in avoiding the abdominal approach to hysterectomy by using a vaginal or laparoscopically assisted vaginal procedure, as the latter avoids the discomfort of a large

Table 3 Hospital stay (number of nights in hospital postoperatively) for successive cohorts of patients

Patient nos	Total patients, *n*	Stay in hospital			Average	Patients having overnight stay, %
		Total	Median	Range		
1–50	50	107	2	2–3	2.14	—
51–100	50	102	2	2–3	2.04	—
101–150	50	92	2	1–6	1.84	28
151–200	50	58	1	1–4	1.16	88
201–265	65	71	1	1–2	1.09	91

Table 4 Complications*

Type of complication	Patient no.	*n*	Comment
Rash and gastroenteritis requiring readmission	12	1	Allergy to lactulose
Blood transfusion (2–4 units)	45, 70, 75, 119, 163, 168, 186	7	
Richter's hernia requiring re-operation	46	1	The 12-mm port is now routinely stitched
Secondary bleeding	75, 92, 148	3	Patient no. 75 received blood tranfusion plus vault stitching
Conversion to TAH	119	1	Patient obemse and with large fibroid; 2 units blood transfusion required
Subrectus haematoma	163	1	Required reoperation and blood transfusion
Superficial wound inflammation requiring antibiotic	169	1	Very obese patient
Total no. of complications		15 (5.7%)	
Total no. of patients suffering complications		12 (4.5%)	

*Minor vaginal bleeding or discharge, gastrointestinal symptoms, and vault granulation tissue, and pre-, per- and postoperative blood transfusion for pre-existing anaemia are not included in this table.

abdominal incision, facilitates early mobilization and thus allows early discharge from the hospital. It also minimizes the burden on patients, their employers and their families by allowing early resumption of routine activities.

Secondary care consumes a large proportion of the health care budget and the need to spend wisely is ever-pressing. Length of stay is one of the main clinical indicators and measures of efficiency and is a major determinant of the resources needed to run a service. The shift of minor treatment to day, ambulatory or even office care has become inexorable, but shortening the length of stay for more significant procedures has the potential to release many more resources.

Morgan *et al.*[5] 1987 described a wide variation in post-operative stay following general surgery in different areas of the UK, and its effect on hospital expenditure. Schwartz & Mendelson[6] were of the opinion that the gradual reduction in costs seen in the 1980s in the United States would not continue into the next decade unless new practice guidelines were successfully implemented.

On the basis of these findings, many observers believe that further efforts to eliminate inappropriate inpatient stays, particularly through the use of new practice guidelines, can alleviate the problems of rising hospital costs and hospital-acquired infections.

Although the magnitude of saving resulting from the shorter hospital stay following LAVH[7] has been disputed[8] because of high equipment costs, it is obvious that further savings may be realized from low postoperative complication rates[9] and lower rates of readmission and reoperation.[10] In addition, a shorter convalescence of 2–4 weeks[11] in an economically active group can be translated into further significant savings which all studies to date have failed to account for. It is difficult to place a monetary value on the reduction in pain and discomfort[12,13] which is achieved. Even apart from costs, there is an undeniable benefit of LAVH compared with abdominal hysterectomy, derived from patient comfort, pain reduction,[12,13] quicker return to normal activity,[11–13] less adhesion formation[14] and better cosmetic effect.[15]

Early hospital discharge following conventional vaginal hysterectomy has been described,[16–19] but information regarding complications arising from such a policy is limited. Many authors[11,12,20–22] have reported a significantly shorter hospital stay of 2–3.5 days following LAVH compared with conventional hysterectomy. An analysis by Meikle[23] of the literature published between 1989 and

September 1995 suggested that the average stay after LAVH was 49 h (SD 16 h). A literature review of practice in the UK reveals the average hospital stay for LAVH to be between 2.5 and 3.8 days.[12,22,24,25]

We have introduced the 'hysterectomy overnight hospital stay service' gradually and cautiously. Initially, the median postoperative hospital stay for our patients was 2.0 days (range 2–3); this has now come down to 1 day (range 1–2, average 1.09 days; Table 4). A total of 117 patients have been discharged home after an overnight hospital stay (see Table 3), and 91% of our patients now leave hospital after an overnight stay. The 9% of patients who stay for a second night do so mainly for social reasons.

We believe we have shown that with sensible case selection, efficient teamwork and an experienced surgeon, the majority of patients can be safely discharged on the first postoperative day.

In general LAVH appears to be associated with a longer operating time than abdominal and vaginal hysterectomy. Richardson *et al.*[24] and Summit *et al.*[8] reported operating times for LAVH to be 125 min compared with vaginal hysterectomy times of 51 min Similarly the mean operating time for abdominal hysterectomy was 75 min compared with 126 min for LAVH.[11,12,20–22] The present author's mean operating time was 98 min (range 55–205 min).

Two main factors, which largely contribute to longer operating time are the number of adjunctive procedures and laparoscopic checking of the vault at the end of vaginal hysterectomy. Of our patients, 168 (63.4%) had additional procedures and 38% had oozing and bleeding of the vault at the end of the procedure which needed attention. Additional procedures include adhesiolysis, excision of peritoneal endometriosis, and drainage and excision of benign ovarian cysts. The extra few minutes needed for the laparoscopic procedure allows complete removal of pathological lesions, produces minimal complications and avoids reoperation at a later date.

Conventional vaginal hysterectomy not uncommonly causes postoperative complications related to vault bleeding, resulting in postoperative interventions, increased rate of blood transfusion, ultrasound evidence of post-surgical haematoma and febrile morbidity. Following conventional vaginal hysterectomy, the reported risk of postoperative bleeding requiring intervention is 1–5%.[9,26–30] In our series only one patient (0.38%) required intervention for postoperative bleeding. This was patient no. 75 who was readmitted on the 18th postoperative day, had two vault stitches and stayed in hospital for 2 days. Two other patients who were readmitted with bleeding on the 12th and 11th postoperative day, respectively, were treated conservatively and stayed in hospital for 1 and 2 nights, respectively. Blood transfusion with all its related hazards is still used in 2–12% of patients with vaginal hysterectomy.[9,28,30] These studies relating to transfusion rates in vaginal hysterectomies were performed at a time when transfusion may have been considered less of a risk. In our series seven patients (2.6%) needed blood transfusion. This included three patients who experienced other complications including secondary haemorrhage, rectus sheath haematoma and conversion to total abdominal hysterectomy. Only 11 patients (4.15%), with a preoperative haemoglobin of 12 g percentage and above, left hospital anaemic and with a haemoglobin of 10 g percentage or below. Haemostasis is easily obtained at laparoscopic surgery because of the magnification, close inspection, and routine use of irrigation and bipolar electrocoagulation. Of our patients, 38% were found to need coagulation of bleeding and oozing points on vault inspection, which was undertaken at an intra-abdominal pressure of 6 mmHg.

In 265 consecutive LAVH procedures we encountered no febrile morbidity, clinically recognizable vault haematoma, or complications related to possible vault haematoma which needed any special treatment or care. The present author feels that this is one of the very important advantages of LAVH over vaginal hysterectomy.

Numerous articles have been written highlighting the complications relating to LAVH and comparing them with complications of both total abdominal hysterectomy and vaginal hysterectomy.[20,29,31] Complication rates of 42.8–47% have been reported for abdominal hysterectomy,[3,32,33] of 15–24.5% for conventional vaginal hysterectomy[33,34] and of 13–18% for LAVH.[4,32,35,36] An analysis by Garry & Phillips[37] of 29 studies produced an overall complication rate of 15.6% for LAVH.

In our series, excluding minor vaginal bleeding, discharge, gastrointestinal upset and vault granulation tissue, 4.5% of patients suffered one or more complications. It appears that LAVH has a lower complication rate than abdominal or vaginal hysterectomy. This is possibly because LAVH combines the advantages of the abdominal and vaginal approaches.

Although the reported rate of major complications (injury to bowel, urinary tract or major blood vessels) is around 5%,[10,37] we have not experienced such a rate, and the series includes no such cases.

Our rate of reoperation and conversion is 1.5% (four patients), which compares favourably with other series where the rate is approximately 3.7%.[10,37] In our series, three patients required subsequent operation for Richter's

hernia, secondary bleeding or subrectus haematoma, and in one case conversion to abdominal hysterectomy was required.

Five patients required readmission (see Table 1). Three patients were readmitted because of secondary bleeding (on the 18th, 11th and 12th postoperative day, respectively). The remaining patients were readmitted as a result of a Richter's hernia and a rash (gastroentritis-related lactulose allergy), respectively. The short hospital stay was not a factor in these readmissions. None of the patients who were discharged after an overnight hospital stay were readmitted.

After dealing with pelvic pathology, the present author does as little as necessary with the laparoscope to assist easy removal of the uterus vaginally. The laparoscopic dissection is stopped after the broad ligament has been opened without ligating the uterine artery or reflecting the bladder. (This step does not allow further descent of the uterus as this is supported by the cardinal and utero-sacral ligaments; moreover it increases the operating time and complications.[38]) It has been argued that after treating pelvic pathology laparoscopically, a vaginal hysterectomy is the optimal procedure; however, laparoscopic ligation of the tubo-ovarian pedicles when the ovaries are to be conserved, or the infundibulopelvic ligaments when the ovaries are to be removed, assists the vaginal part of the hysterectomy. This step not only helps in the reduction of blood loss during vaginal hysterectomy, by obliteration of the ovarian vessels, but also makes vaginal hysterectomy easier, especially when the uterus is large or oöphorectomy is needed. At the end of the procedure, the present author makes a thorough inspection of the pedicles laparoscopically, using an intra-abdominal pressure lower than capillary pressure, i.e. 6 mmHg, and any bleeding points seen are treated with bipolar diathermy.

The published rates of complications of LAVH are highly variable. I believe our low rate is achieved by limiting the extent of laparoscopic dissection and by meticulous haemostasis under laparoscopic control at the end of the operation.

Finally, I believe that the factors enabling us to produce an 'hysterectomy overnight stay service' include thorough preoperative counselling and postoperative support, a clear policy for analgesia and a meticulous and well-developed technique.

LAVH is a low-complication procedure in experienced hands, provided the indications for and limitations of the procedure are well known to the surgeon. It is safe and acceptable to discharge patients after an overnight hospital stay provided that our protocols are followed. I believe that with adequate training this practice can be implemented widely in the National Health Service (NHS) in the United Kingdom, following our guidelines.

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