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Paper

Comparison of Laparoscopic-assisted Vaginal Hysterectomy, Total Abdominal Hysterectomy and Vaginal Hysterectomy

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INTRODUCTION

Hysterectomy is one of the most commonly performed major operations. Approximately 600,000 hysterectomies are performed in the United States each year[1] and 20% of women in the UK undergo hysterectomy before the age of sixty.[2] Historically the uterus has been removed by either the abdominal or vaginal route. The vaginal operation is preferable when there are no contraindications because of lower morbidity and quicker recovery.[3] The VALUE Study[4] suggested that 67% of surgeons still used the abdominal approach as the operation of choice, particularly when dealing with pelvic pathology or carrying out oophorectomy.

Since it was first reported by Reich *et al* in 1989[5] laparoscopically assisted vaginal hysterectomy (LAVH) has gained widespread acceptance. Laparoscopic dissection of the para-uterine tissues to the level of the uterine arteries (LAVH) or to include the uterine arteries (laparoscopic hysterectomy), also permits oophorectomy or dissection of adhesions under direct vision more easily than this can be achieved at vaginal hysterectomy (VH). Farquhar and Steiner[6] found that between 1990 and 1997, in the USA, there was a growth in the number of hysterectomies performed with laparoscopic assistance (0.3-9.9%) with an associated decline in the proportion of hysterectomies performed abdominally.

Recently the eVALuate Study concluded that LAVH was associated with a significantly higher rate of major complications than abdominal total hysterectomy (TAH). LAVH took longer to perform but was associated with less pain, quicker recovery and better short term quality of life measures. The arm of the trial involving VH was underpowered and inconclusive although VH did take less time than LAVH.[6] In contrast to this the study by Lumsden et al[7] did not show any difference in post-surgery recovery, satisfaction with the outcome of the operation or quality of life four weeks post-operatively between TAH and LAVH.

The aims of our study were to compare LAVH with TAH and VH in a retrospective non-randomised analysis and to evaluate intra and post-operative complication rates and patient recovery times.

SUBJECTS AND METHODS

A retrospective observational study in the Belfast City Hospital was carried out comparing LAVH, TAH and VH. The study period was from January 2002 to January 2004 inclusive, a 25 month period. Patients undergoing LAVH for non-malignant conditions were identified from theatre diaries and the hospital based computerised coding system. A similar number of patients, matched for

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pathological diagnosis, were selected from theatre diaries for both TAH and VH.

Medical records of the patients identified were reviewed; factors examined included demographic details, indication for operation, intra-operative details, histopathology summary, post-operative recovery and subsequent post-operative review findings. One hundred and thirty five hospital charts were reviewed, 47 for patients undergoing LAVH, 45 TAH and 43 VH.

The primary operator was a consultant in 60% of patients undergoing LAVH, 31% of those having TAH and 26% of VH procedures.

Demographic characteristics demonstrated a trend of increasing age from LAVH to TAH to VH. Similarly 100% of VH's were parous in comparison with both of the other groups in which approximately 80% of patients were parous (*Table I*).

Indications for surgery are listed in Table I.

RESULTS

LAVH took significantly longer than both TAH and VH but there was no significant differences in operating times between TAH and VH (*Table 2*). The average weight of specimen increased from 100g (range 29-415g) in the VH group to 127g (range 38-515g) in the LAVH group through to 265g (range 70-1066g) for the TAH group.

Intra-operatively, adhesions were diagnosed in 30 of 135 cases (22.2%), 13/47 in the LAVH group, 15/45 in the TAH group and 2/43 in the VH group. Fibroids were diagnosed in 22 cases (16.3%) of which 14 were in the TAH group (VH 3, LAVH 5 cases).

In the LAVH group 36/47 cases (81%) included salpingo-oophorectomy or bilateral salpingo-oophorectomy, in the TAH group 37/45 cases (82%) included bilateral salpingo-oophorectomy whereas only 12/43 cases undergoing VH (28%) included uni- or bilateral salpingo-oophorectomy.

Histopathologically, fibroids were diagnosed in 54 cases (40%) with the greatest proportion in the TAH group (51%, 23 cases) compared with 19% for the LAVH group (9 cases) and 37% of patients undergoing VH (16 cases). Fibroids in women undergoing VH were typically small and this is reflected in the average specimen weight noted above.

Three patients in each of the three groups required blood transfusion. A single patient from each group sustained either a bowel or urinary tract injury (bladder injury in both LAVH and TAH, bowel injury in VH): all were noted at the time of operation, repaired and had no resultant problems at post-operative follow-up.

In the LAVH group there were five unplanned conversions to laparotomy: two cases were for dense adhesions, one for inability to maintain haemostasis, one because of a fibroid uterus and one due to minimal descent of the cervix and uterus. In four of these five cases, it was anticipated that surgery may be complicated because of historical factors. In the VH group a laparotomy was performed to rule out an intra-peritoneal bleed and a laparoscopy was performed to retrieve a swab which had migrated intra-abdominally during the procedure.

Minor post operative complications were also noted, including pyrexia, wound and urinary infection, vault and wound haematoma, and dehiscence (*Table III*). There were four readmissions following discharge, three required further treatment, two (TAH 1, VH 1) returned to theatre for drainage of vault haematoma and one (LAVH) had re-suturing of an umbilical incision. A further two patients returned to theatre during their initial admission, one (LAVH) for drainage of vault haematoma and one (TAH) for drainage of abdominal wound haematoma (*Table II*).

The median total length of stay for TAH was 8.3 days (range 5-20) but was significantly less for both LAVH (6.1 days, range 3-18) and VH (5.9 days, range 3-13). Post-operatively, patients undergoing TAH required more analgesia with only 16% requesting no analgesia during their immediate post-operative recovery period compared with 40% and 37% in the LAVH and VH groups respectively.

At six week review, patients undergoing TAH reported more post-operative problems (9/45 cases, 20%) compared with LAVH (4/47 cases, 8.5%) and VH (5/43 cases, 11.6%).

DISCUSSION

Since Reich described LAVH in 1989, the uptake of the procedure has been slow and subject to considerable geographical variation, with some units performing most of their hysterectomies by this route and others performing none. The number

TABLE I

Demographic characteristics including previous surgery, the indication for surgery, surgical intra-abdominal pathology, and histopathology summary. Values are given as percentage means with number in brackets.

	LAVH (n=47)	*TAH (n=45)*	*VH (n=43)*
Age (years)	43	46.4	48.3
Parous	82.2 (39)	80 (36)	100 (43)
Previous pelvic surgery	9 (4)	2 (1)	9 (4)
Indication for surgery			
DUB	64 (30)	60 (27)	58 (25)
Fibroids	2 (1)	9 (40)	0
Pelvic pain	4 (2)	13 (6)	0
Endometriosis	4 (2)	2 (1)	0
Prolapse	6 (3)	0	33 (14)
PMB	2 (1)	9 (4)	0
Other	17 (8)	7 (3)	9 (4)
Intra-abdominal pathology			
Adhesions	28 (13)	33 (15)	5 (2)
Fibroids	11 (5)	31 (14)	7 (3)
Endometriosis	4 (8)	2 (1)	0
Other	4 (8)	4 (2)	19 (8)
Histopathology			
No significant pathology	19 (9)	10 (4)	21 (9)
Fibroids	19 (9)	51 (23)	37 (16)
Endometriosis	2 (1)	0	0
Other	60 (28)	39 (18)	42 (18)
Weight of specimen (grams)	127	265	100

TABLE II

Major items of resource use. Values are given as percentage means with number in brackets.

	LAVH (n=47)	*TAH (n=45)*	*VH (n=43)*
Total length of anaesthetic time (mins)	95	73.9	74.4
Total length of stay (days)	6.1	8.3	5.9
Women requiring additional surgery	6.4 (2)	4.4 (2)	2.3 (1)
Readmissions	4.3 (2)	2.2 (1)	2.3 (1)
Blood transfusions	6.4 (3)	6.7 (3)	7 (3)
Primary operator consultant	60	31	26

TABLE III

Complications. Values are given as percentage means with number in brackets.

	LAVH (n=47)	*TAH (n=45)*	*VH (n=43)*
Major complications			
Haemorrhage (requiring transfusion)	6.4 (3)	6.7 (3)	7 (3)
Urinary tract damage	2.1 (1)	2.2 (1)	0
Bowel damage	0	0	2.3 (1)
Laparotomy/Laparoscopy	10.6 (5)	0	4.7 (2)
Total	**19.1 (9)**	**8.9 (4)**	**14 (6)**
Minor Complications			
Pyrexia >38°C	2.1 (1)	0	2.3 (1)
Urinary tract infection	4.3 (2)	2.2 (1)	2.3 (1)
Wound infection	4.3 (2)	4.4 (2)	0
Erythema wound	2.1 (1)	0	0
Wound dehiscence	4.3 (2)	0	0
Vault haematoma	0	8.8 (4)	4.7 (2)
Wound haematoma	1 (2.1)	4.4 (2)	0
Total	**19.2 (9)**	**19.8 (9)**	**9.3 (4)**

of hysterectomies performed in this unit for benign disease has increased as a proportion of the overall number of hysterectomies performed, with 36 hysterectomies performed laparoscopically in a previous study [8] over a time frame of 37 months compared with 47 during the time-frame of this audit (25 months). The still relatively low rate of LAVH reflects the caseload in this unit, where many of those undergoing VH have significant prolapse and those undergoing TAH have enlarged uteri or fibroids although genetic screening for hereditary non-polyposis colon cancer and breast/ovarian cancer has increased the rates of preventative hysterectomy, and may increase the number of asymptomatic cases.[9]

A greater proportion of LAVH's than both VH and TAH were performed with the Consultant as the primary operator. We feel that the reasons for this are two-fold. Firstly, the number of LAVH's performed for benign disease remains low and therefore the experience gained, even by Consultant staff, often takes a considerable time. This is reflected in the high number of conversions to laparotomy in the LAVH group, where, some of the conversions to laparotomy may have been avoided if greater experience had been accrued. The eVALuate study [10] concluded that although it could be considered that such conversions represented prudent surgery it was felt that on the balance they represented a failure of planned procedure and should be considered as major complications. The second issue is the time LAVH takes in comparison to VH and TAH. It is recognised that surgeons in training will take longer to perform surgical procedures than those who have been trained. One perception of LAVH is that the procedure takes longer and this has been shown in a number of studies, including this one, to be the case. In this circumstance, there is often reluctance, given the pressure on operating time, to spend longer performing a procedure than is necessary.

Although limited data was gathered on the post-operative recovery phase, the results of this study are similar to those of others, i.e. that patients undergoing LAVH and VH benefit from a quicker and less complicated recovery than TAH,[7,8,11] with discharge from hospital more than 2 days earlier and significantly less requirement for analgesia. These factors reduce the indirect costs of the surgery, but this must be offset against the longer operating times needed for LAVH.

CONCLUSION

The proportion of hysterectomies performed with laparoscopic assistance has increased in this unit, but the overall number remains low. Factors affecting the uptake of LAVH include surgeon's experience and training in these techniques. In operations completed laparoscopically, the complication rates were comparable to those for TAH and VH. Therefore, when possible, VH should be the procedure of choice. However, for patients with more complex pathology, the choice between LAVH and TAH will depend on the surgeon's experience. LAVH has been shown in other studies to be more expensive in direct costs, but the overall cost benefit analysis favours a laparoscopic approach over the abdominal approach.

CONFLICT OF INTEREST

The authors have no conflict of interest.

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