

Early experience of laparoscopically assisted radical vaginal hysterectomy (Coelio-Schauta) versus abdominal radical hysterectomy for early stage cervical cancer

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Abstract The objective of this study was to compare outcomes of laparoscopically assisted radical vaginal hysterectomy (LARVH) vs. abdominal radical hysterectomy (RH) for early-stage cervical cancer. This is a retrospective study of all LARVH and RH procedures between January 2003 and June 2006 in our tertiary referral centre. Demographic, intraoperative and postoperative parameters in both groups were compared. Fourteen women (stage IA2–IB) underwent LARVH, and 12 women (stage IA2 to IB) had RH. All had clear excision margins. None of the laparoscopic procedures were converted into laparotomy. There have not been any recurrences in either group during the follow-up period. We conclude that LARVH and RH are equally efficacious surgical methods. The LARVH group had shorter hospital stay, reduced blood loss, shorter bladder recovery time, less postoperative complications but higher intraoperative injury rate in comparison to RH. This may reflect the learning curve of this new procedure.

Keywords Coelio-Schauta · Radical hysterectomy · Cancer · Cervix · Wertheim

Introduction

Cervical cancer affects 3,500 [1] women a year in the UK and still accounts for approximately 1,000 [2] deaths. It is the second commonest solid tumour in women under

35 years. Early-stage cervical cancer is traditionally treated by Wertheim's radical hysterectomy [3] (RH) and pelvic lymphadenectomy. However, laparoscopically assisted radical vaginal hysterectomy [4] (LARVH), also known as Coelio-Schauta, with laparoscopic bilateral pelvic lymphadenectomy is an alternative [5] surgical method for women who do not wish to preserve their fertility.

Improvement in laparoscopic techniques and equipment allows more complex minimally invasive operations to be performed safely. Dedicated training centres and early incorporation of technological advances continue to make laparoscopic surgery more widely applicable. One more such improvement has been the introduction of the Ultracision® (Ethicon Endo-Surgery, Johnson & Johnson Medical) harmonic scalpel, which we used throughout our laparoscopic cases that facilitated pelvic lymphadenectomy. The Coelio-Schauta operation is not a purely laparoscopic operation and involves considerable vaginal surgical dissection. One potential major advantage of the Coelio-Schauta operation is that it shares many steps with the radical vaginal trachelectomy which is performed for small volume IA2–IB1 cervical cancers when fertility is desired.

In this study, we compare outcomes of our early experience with LARVH in comparison with those treated by RH in our tertiary referral centre.

Materials and methods

We performed a retrospective review of all LARVH for cervical cancer, in the Royal Surrey County Hospital, between January 2003 and June 2006 after introduction of LARVH as a new procedure. During this period, 14 women underwent LARVH. The operation results were compared

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with the 12 RH performed during the same period of time for cervical cancer. All tumours were stage 1A2–1B.

All cases, including the relevant histopathological findings, were discussed and reviewed both preoperatively and postoperatively at the multidisciplinary team meeting. They all had an examination under anaesthesia (EUA) and were seen by a specialist nurse preoperatively. Preoperative and postoperative care was adjusted to the needs of each individual patient. Patients on anticoagulant or antiplatelet medication had their treatment discontinued for a week before the operation and were given low-molecular-weight heparin (LMWH) preoperatively (Enoxaparin 40 mg once daily) following the department's policy. Patients were medically optimised preoperatively, and this included multidisciplinary approach when needed. All patients were given postoperative thromboprophylaxis with LMWH (Enoxaparin 40 mg once daily) for a maximum of 2 weeks.

Patients gave informed consent in all cases, and particular emphasis was given to their wishes for the selection of the type of operation. Uterine descent, size, pelvic access, stage of disease, comorbidities and general health were carefully noted during preoperative assessment. Appropriate imaging with either pelvic magnetic resonance imaging and/or computed tomography was performed in all cases. The option of having a LARVH was offered to all patients with early cervical cancer requiring radical hysterectomy who demonstrated adequate vaginal access at EUA. Criteria to demonstrate a good vaginal access included subjective assessment of the adequacy of the pelvic outlet for a vaginal procedure and of the ability to satisfactorily abduct the thighs.

Characteristics of the operations performed are shown on Table 1.

Three patients in the LARVH group underwent also bilateral salpingo-oophorectomy as did nine in the RH group.

All LARVHs were performed by S.B.M., as the senior surgeon, and RHs by A.T. or S.B.M. Pelvic lymph node dissection was done systematically using standardised technique [6].

Ultracision® harmonic scalpel was the primary instrument in all LARVHs.

Table 1 Type of operation

	LARVH	RH
Total	14	12
BSO	3	9
BPLND	13	12
LN +ve	1 (7.7%)	2 (16.7%)

LARVH laparoscopically assisted radical vaginal hysterectomy, *RH* abdominal radical hysterectomy, *BSO* bilateral salpingo-oophorectomy, *BPLND* bilateral pelvic lymph node dissection, *LN+ve* lymph node involvement

The length of operation was determined from the anaesthetic records for each procedure. Blood loss was calculated by weighing the swabs and by measuring the total fluid volume in the suction minus any irrigation fluid used.

Demographic, intraoperative and postoperative parameters in both groups were compared. All complications were recorded and divided into “early” (before discharge from the hospital) and “late” (following discharge from the hospital).

The follow-up period ranged from 6 to 42 months for both groups.

We compared results in the two groups for normality and variance. Descriptive statistical methods included estimation of mean, range of values and standard deviation (SD). We measured statistical significance of the difference between the groups, for age, weight, operation length, blood loss and number of lymph nodes, with the *t* test. Difference in blood transfusion between the two groups was measured with the Fisher exact test and difference in hospital stay with the Mann–Whitney *U* test.

Results

Of the 14 LARVH, 13 underwent bilateral pelvic lymph node dissection (Table 1). All the 12 RH underwent bilateral lymph node dissection. The mean number of lymph nodes retrieved was similar (Table 2) in the two groups: 22.4 in the LARVH group and 21.5 in the RH group ($p=0.852$). Para-aortic lymph nodes were not removed or sampled in any case.

There was one (1 of 13, 7.7%) case of positive lymph node in the LARVH group and two cases (2 of 12, 16.7%) in the RH group.

Statistical analysis of demographic and perioperative data is shown on Table 2.

The two groups were of similar age range ($p=0.157$) and demographic background.

Mean patient weight was 66.9 and 75.6 kg for LARVH and RH, respectively ($p=0.316$).

Operating times were similar for the two groups: 243 min for the LARVH group and 212 min for the RH group ($p=0.365$).

Intraoperative blood loss was statistically different: 725 ml for the LARVH group and 1,438 ml for the RH group ($p=0.014$). Blood transfusion rate was lower in the LARVH: six (43%) of the patients in the LARVH group compared to eight (67%) in the RH group. This difference was not statistically significant ($p=0.267$). The numbers of blood units transfused intraoperatively and postoperatively were similar in both groups (Table 3).

Mean hospital stay for the LARVH group was 4.4 days and for the RH group was 7.9 days. The difference in hospital stay was highly significant ($p<0.001$).

Table 2 Statistical analysis of demographic and perioperative data

	LARVH			RH			<i>p</i>
	Mean	Range	SD	Mean	Range	SD	
Total number of nodes	22.4	8–49	10.6	21.5	1–41	12.8	0.852
Age (years)	38.6	25–81	3.6	43.5	27–76	12.9	0.157
Weight (kg)	66.9	48–97	13.6	75.6	57–133	21	0.316
Operation length (min)	243	150–390	71.3	212	110–270	55.4	0.365
Intraoperative blood loss (ml)	725	100–2000	537.3	1438	200–2500	821.6	0.014
Length of hospital stay (days)	4.4	2–8	1.9	7.9	6–11	1.8	<0.001

Histopathological assessment revealed clear tumour resection margins in all cases examined.

Summary of all intraoperative and early and late postoperative complications is shown on Table 4.

Intraoperative complications in the LARVH group occurred in four (28.5%) cases. These included two cystotomies, one ureteric injury and one obturator nerve injury. All injuries were repaired laparoscopically. None of the laparoscopic procedures were converted into laparotomy. In the RH group, the only intraoperative complication was one cystotomy that was repaired during the operation.

During the early postoperative period, five (35.7%) patients in the LARVH group had a complication. Of these, one complained of chest pain and another of unilateral leg pain, but after appropriate investigation, no pathology was discovered in either case; one patient suffered unilateral neurapraxia of the obturator nerve. In one case, there was transient vaginal wound inflammation; one patient developed short-term urinary retention and had to be discharged from the hospital with urinary catheter in situ for 10 days.

In the RH group, during the early postoperative period, seven (58.3%) patients had a complication. Of those, four (33.3%) cases had urinary tract complications, including two patients with urinary incontinence, one case of bladder sensation loss and one case of short-term urinary retention requiring discharge from the hospital with urinary catheter in situ for 8 days. In addition, one patient developed unilateral neurapraxia of the obturator nerve, and two patients experienced a wound complication.

Drain output was not found to be excessive in any case. No patient in either group needed to return to theatre in the immediate postoperative period.

Bowel recovery was usual in both groups with no related problems.

Late complications for the LARVH group involved seven (50%) patients. Among these, there was one case of unilateral thigh muscular atrophy following intraoperative injury to the obturator nerve. Two cases experienced thigh paraesthesia and numbness, presumably due to inadvertent injury of lateral branches of the genitofemoral nerve, during lymphadenectomy. One patient suffered recurrent urinary tract infections, one patient complained of long-term vaginal discharge, one patient underwent laparoscopic adhesiolysis 37 months after the primary operation, and one woman with conserved ovaries suffered unilateral tuboovarian abscess. This patient subsequently underwent unilateral salpingo-oophorectomy 19 months after her original operation.

In the RH group, ten patients (83.3%) had a late complication. The most frequent ones were mild wound problems involving four patients (33.3%). The most serious complication was the case of a patient who suffered a vesicovaginal fistula requiring unilateral ureteric re-implantation 7 months after her original operation, which was at least in part related to adjuvant pelvic radiotherapy. Other complications in the same group of patients were one case of unilateral obturator neurapraxia, one case of vulval vestibulitis, one case of severe chronic constipation, one case of urinary incontinence and one woman with chronic oedema on mons pubis.

Adjuvant radiotherapy was given to one patient in the LARVH group with positive lymph nodes and to five patients in the RH group. Of those five patients in the RH group, two had lymph node involvement, one was a case of a clear cell carcinoma, one had a narrow resection margin of 2 mm with perineural and vascular invasion and one was the case of a patient who actually requested to undergo radiotherapy.

There have not been any disease recurrences in either group.

Table 3 Blood transfusion

	Number of cases requiring transfusion	Percentage	<i>P</i>	Mean number of units transfused	
				Intraoperative	Postoperative
LARVH	6	43	0.267	2.3 (range, 1–4)	2.2 (range, 1–4)
RH	8	67		2.1 (range, 1–4)	2.5 (range, 2–4)

Table 4 Intraoperative and early and late postoperative complications

	Intraoperative	Number	Percentage	Early postoperative	Number	Percentage	Late postoperative	Number	Percentage			
LARVH (<i>n</i> =14)	Cystotomy	2	14.3	Chest pain	1	7.1	Paresthesia	2	14.3			
	Ureteric injury	1	7.1	Leg pain	1	7.1	Thigh muscular atrophy	1	7.1			
	Obturator nerve injury	1	7.1	Neurapraxia	1	7.1	long-term vaginal discharge	1	7.1			
				Vaginal wound inflammation	1	7.1	Tuboovarian abscess	1	7.1			
				Urinary retention	1	7.1	Recurrent UTI	1	7.1			
						Adhesions	1	7.1				
RH (<i>n</i> =12)	Cystotomy	1	8.3	Urinary incontinence	2	16.6	Wound inflammation	3	25			
				Neurapraxia	1	8.3	Neurapraxia	1	8.3			
							Urinary incontinence	1	8.3			
				Bladder sensation loss	1	8.3	Vestibulitis	1	8.3			
				Urinary retention	1	8.3	Vesicovaginal fistula	1	8.3			
				Hypertrophic scar	1	8.3	Chronic oedema on mons pubis	1	8.3			
							Vaginal wound inflammation	1	8.3	Chronic constipation	1	8.3
										Dog ear	1	8.3

The only case of a late death was a patient (7.1%) in the LARVH group, aged 81 years, who sadly suffered a lethal cerebrovascular accident (CVA) 7 months postoperatively. It is unknown whether the CVA was related to recurrence of her disease, as a postmortem examination was not performed.

Discussion

LARVH and RH are equally efficacious surgical methods for the treatment of early-stage cervical cancer. They have similar rates but different pattern of complications. The LARVH group had shorter hospital stay, reduced blood loss, shorter bladder recovery time but higher intraoperative injury rate than RH. Postoperative complications, especially involving the urinary tract, as well as wound complications were more frequent in the RH group.

In today's gynaecological cancer surgery, it is imperative to aim to reduce morbidity for the patient while maintaining a high cure rate. It is widely recognised [7, 8] that appropriate use of minimal access techniques may lead to reduced blood loss and analgesic requirements, shorter hospital stay and faster return to normal physical activities. Reduced scarring and maintenance of body image may be important for young patients [9]. We have shown in our study that the patients who underwent LARVH had a statistically significant reduction in hospital stay in comparison to RH patients ($p < 0.001$), in contrast to other reported series [10].

We have also shown that intraoperative blood loss is lower in the LARVH group ($p = 0.014$); however, the blood transfusion requirements in the two groups were similar.

The incidence of cervical cancer is falling and hence the number of operations performed is less than previously. A greater understanding of the behaviour of small-volume cervical tumours has led to less radical and fertility-sparing options for many. Hence, the numbers of patients requiring radical hysterectomy are greatly reduced.

Obesity is not a contraindication to either laparoscopy or laparo-vaginal approach to surgery. Indeed, in our experience, a laparoscopic radical vaginal approach may be easier than an abdominal approach in the obese. Furthermore, the radical vaginal dissection is the same as that used in radical vaginal trachelectomy in those requiring preservation of fertility.

It is increasingly recognised that a more individualised approach to treatment [11] is appropriate. We advocate that LARVH may be a step forward in this direction.

Intraoperative complications were more common in the LARVH group. Two cases (50%) suffered bladder perforation which was repaired transvaginally. Both occurred very early in the series. Two further cases (50%) suffered injuries related to the laparoscopic node dissection. One obturator nerve was injured and one ureter was divided.

There were no transvaginal ureteric injuries during the LARVHs. A ureteric injury during a LARVH occurred at the time of laparoscopic division of the ovarian vessels, and operator fatigue was contributing factor in this case.

Quantitative studies [12] have shown that autonomic nerve trauma is common with RH [13], particularly during resection of the uterosacral and cardinal ligaments [14].

Postoperative urinary tract dysfunction was higher in the RH group, as has been reported earlier in the literature [15]. However, the difference between the two groups was not compared for significance because of the small numbers of the patients involved.

Any consensus regarding the complexity and possible high complication rate of the Coelio-Schauta operation does not seem justified. This is not a randomised study and the patients were advised in favour of either an abdominal or laparoscopic approach in light of the EUA results. However, the comparison of one group with the other sets the scene for this novel approach.

Certainly, the operator's learning curve [7] appears to be an important factor in the reduction of intraoperative complications. LARVH is technically difficult if the surgeon is not experienced in vaginal surgery, and these 14 cases probably still represent a continued learning curve for the surgeon involved.

Mean operation length was longer in the LARVH group, but the difference was not statistically significant. Statistically significant results have been reported in the past [16], and it has been advocated recently [8] that this may be the result of more detailed pelvic lymphadenectomy during LARVH. However, in our study, there was no evidence to support this, as the numbers of lymph node retrieved were similar in the two groups. We have found the radical vaginal dissection the most challenging part of the procedure to master, and this may reflect the higher operative times.

We did not assess the psychosexual impact of LARVH or RH in this study. However, several LARVH patients have volunteered during consultation that they were very pleased with the reduced scarring and preservation of body image compared with open surgery. This is the main subject of a currently ongoing study in our department.

In this study, both LARVH and RH appeared equally efficacious in the treatment of early-stage cervical cancer with no recurrences in either group, in contrast to other published data [17, 18]. The two procedures carry similar complication rates but with a different pattern of problems following each. These data of our early experience of LARVH demonstrate the efficacy of the technique, but will it also prove to be a stepping stone in the evolution of radical hysterectomy techniques?

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