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Laparoscopic assisted radical vaginal hysterectomy for cervical carcinoma : morbidity and long-term follow-up

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ABSTRACT

Objectives: To study the feasibility, morbidity and outcome of cervical cancer patients treated with laparoscopic assisted radical vaginal hysterectomy (LARVH).

Methods: The study group included 53 women with cervical cancer (stage Ib). They included women undergoing LARVH at the joint cancer-centres between 1994 -2002. Data was collected on operating-time, nodal-yield, hospital-stay, complications recurrence rate and survival rate. The group was followed up until 2006.

RESULTS: Of 53 women who were selected for LARVH, in 2 women LARVH was abandoned when nodes were positive at frozen section. The median age was 42 years while the operating-time was 210min with a nodal yield of 23 and a hospital-stay of 5 days. Final histology revealed 10 women with lympho-vascular invasion, 1 nodal metastases and invasion of parametrium / vagina in 2 women. 7 received adjuvant radiotherapy. 3 had chemo-radiation. Complications included voiding-difficulty (6), urinary tract infection (5), pyrexia (4), haemorrhage (2), pain (1), port-site haematoma (1) and nerve injury (1). Late complications included lymphoedema (4), urinary incontinence (4), voiding-problems (2), lymphocyst (1), venous-thrombosis (1) and rectocele (1). The median follow-up was 41 months. 4 women had recurrence, of which 3 women died. The five year survival was 89%.

CONCLUSIONS:

Vaginal radical hysterectomy with laparoscopic pelvic lymphadenectomy is feasible and safe with regards to mortality and has low morbidity.

KEYWORDS:

Cervical cancer; laparoscopic assisted radical vaginal hysterectomy; morbidity; Recurrence-free survival

INTRODUCTION

The surgical management of cervical cancer has undergone considerable changes over the past few years. The aim has been to reduce the morbidity associated with surgery without compromising the survival.

In the past, the vaginal route for radical hysterectomy did not become popular because of the need for an abdominal incision for pelvic lymphadenectomy. The vaginal approach has been revived as a result of the development of laparoscopic pelvic lymphadenectomy, an approach considered to be not only less invasive but also achieving excellent lymph node clearance ^[1, 2, 3]. In 1987, Dargent was the first to describe the technique which combined Schauta's operation with laparoscopic removal of the lymphnodes ^[4].

In the recent years there has been a trend to evaluate the morbidity, recurrence rates and survival following laparoscopic assisted radical vaginal hysterectomy after the initial studies on feasibility and different techniques ^[5-9]. The overall morbidity in cervical cancer patients seems to be a cumulation of surgical and adjuvant interventions and reducing surgical morbidity by adopting the least invasive route for surgery is quite promising.

We undertook this study to report the long term morbidity, recurrence and survival outcome in our series of laparoscopic assisted radical vaginal hysterectomy (LARVH).

MATERIALS & METHODS

(i) Patient Group:

Our study group included 53 women with cervical cancer (stageIb) undergoing LARVH over a period of eight years (July 1994 to July 2002) in the cancer network comprising of St Bartholomew's NHS Hospital (London) and Barking, Havering & Redbridge NHS Hospitals (Essex) in the United Kingdom.

(ii) Inclusion Criteria:

All cases of FIGO stage $\leq$ Ib1 (selected after thorough clinical, histopathological and radiological assessment with MRI) and no radiological evidence of lymphnode involvement or metastatic disease were selected for LARVH.

(iii) Surgical Technique:

We followed the previously described technique of modified radical hysterectomy by Querleu D and Dargent D et al ^[10]. Our extent of radical dissection corresponded to Type-II Piver-Rutledge classification of extended hysterectomy where the medial half of the uterosacral and cardinal ligaments were removed with uterine vessels being divided medial to the ureter. A laparoscopic pelvic lymphadenectomy was performed through a transperitoneal or a retroperitoneal approach using the technique previously described in the literature ^[1,2,4].

(iv) Data collection & Follow-up:

Operating-time was calculated from anaesthetic charts (incision to completion of surgery). The nodal-yield was determined at histological assessment. The hospital-stay and complications were recorded.

All women had their catheter removed 48 hours postoperative. Those with residual volume of urine >100mls were re-catheterised. Where the final histology revealed invasion beyond cervix or in the presence of two or more poor prognostic factors {poorly differentiated tumour, close margins and lymphatic/vascular space invasion (LVSI)} or nodal metastases, women received adjuvant radiotherapy or chemoradiation. We maintained a prospective follow-up by interview and clinical examination. All women were questioned for any urinary or bowel symptoms. Those

with urinary incontinence had urodynamic assessment. The recurrence-free survival data was calculated from the date of surgery and Kaplan and Meier method was used to calculate the overall survival in the LARVH group.

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RESULTS

(i) Patient Group:

Of the 53 women 51 completed LARVH. Two women had positive nodes at frozen section and therefore radical hysterectomy was not carried out. They both had chemoradiation. Their median age, parity and histology details are shown in table 1.

(ii) Surgical Details:

Laparoscopic lymphadenectomy was performed one week prior to radical vaginal hysterectomy in 15 women. Paraaortic lymphnodes were sampled in one woman where there was suspicion of gross enlargement. The nodes were negative on histology.

The surgical and postoperative data are shown in table 1. The operating time was prolonged in 3 cases due to difficult vaginal access, intra-operative bleeding and extensive adhesions respectively.

(iii) Histopathology:

Of 51 women who had LARVH, none had positive nodes on histology. 2 women had occult vaginal and parametrial invasion on histology. 11 women had LVSI while one woman had tumour involvement of the surgical margins.

(iv) Complications:

The complications in our series are listed in table 2. One case of urinary incontinence presented 12 days after surgery but this resolved following pelvic floor exercises. One case of secondary haemorrhage from the vault following infection and another one with pelvic collection were managed with antibiotics. A large pelvic lymphocoele diagnosed two years after surgery needed laparoscopic drainage.

7 women experienced problems with the urinary tract. 2 had voiding difficulty. The first presented at one month but her symptoms resolved spontaneously. The other presented at 12 months and required urethral dilatation. 5 women developed urinary incontinence. The median time interval from surgery to presentation of symptoms of incontinence was 12 months (1-58 range). Three had detrusor over-activity, one had urodynamic stress incontinence and another had combined detrusor over-activity and

urodynamic stress incontinence. The symptoms resolved in all women with pelvic floor exercise and bladder drill.

There was no long-term gastrointestinal morbidity attributed to surgery alone. One woman receiving external beam radiotherapy had radiation-induced sub-acute bowel obstruction followed by an entero-colic fistula at 32 months after surgery.

(v) Survival and Outcome:

Table 3 gives details of follow-up, adjuvant therapy and survival outcome. 4 women in our series were lost to follow-up. 4 women had recurrence. Three of these recurrences occurred in the pelvis. Two of them had had adjuvant radiotherapy with their primary treatment and now received chemotherapy. They later developed distant metastatic disease and died. The third woman who had pelvic recurrence received chemoradiation. There was one woman with distant recurrence who later died. Another woman succumbed due to an unrelated cause.

DISCUSSION

Radical vaginal hysterectomy was first described in 1901 by *Schauta* ^[11]. The apparent advantages of vaginal route include a short hospital stay, early recovery and less blood loss at surgery ^[8,9,12,13,14,15,16]. Whether it has any additional benefits for overall morbidity or survival is still unclear.

(i) Operative Parameters & Histology:

Our nodal yield and the operative parameters of LARVH are similar to other authors ^[8,9]. The latter third of our group had histology of pelvic nodes before vaginal surgery. Two women deferred surgery and received chemoradiation instead. This practise avoids delay in starting adjuvant therapy.

Our initial staging by examination, MRI and laparoscopy at the time of lymphadenectomy failed to pick up two cases with invasion into the parametrium or vagina. These were identified at final histology. Such cases where there is microscopic spread beyond the cervix are occasionally difficult to identify during clinical or radiological staging. When they finally get detected on histology then they get completion treatment with chemoradiation.

We appreciate that our study group comprised of a significant proportion of women diagnosed with adenocarcinoma. This may either be a coincidence or perhaps a reflection of the trend already witnessed in the UK where the proportion of adenocarcinoma has risen in recent years. Cancer screening programme seems to have more false negative test results with glandular abnormalities and detect predominantly squamous type lesions.

(ii) Surgical Complications:

The majority of our complications occurred in the first half of our series. It is postulated that it takes 20 cases to get skilled to perform this procedure ^[7]. Complication rates decrease with experience and are similar to abdominal route ^[8, 9, 12, 13, 16]. Wound infection, febrile morbidity and the incidence of paralytic ileus may be lower with LARVH ^[13]. We had no case of wound infection or paralytic ileus. Port site haematoma in one woman was managed conservatively.

With experience majority of intraoperative complications can be dealt at laparoscopy. In our series, in a woman who had haemorrhage from the ureterovesical angle, this was controlled by laparoscopic internal iliac ligation. The rate of conversion to laparotomy has been reported in the literature to be less than 1 in 20 cases and is most likely to happen during the initial learning phase ^[5, 17, 18]. Table 4 lists the reported long-term complications with LARVH.

(iii) Urinary tract morbidity:

We did not encounter any bladder or ureteric injury in our series. LARVH may have a lower risk of bladder dysfunction when compared to abdominal route ^[15, 16]. We encountered voiding problems in 6 women. Steed et al ^[9] reported the median time to normal residual volume (<100ml) as 10 days (2-71 range), but he assessed bladder function in majority of their patients at 10 days after surgery. Others have quoted the mean time for restoration of bladder function to be around 11 days (1-50 range) ^[5]. In our series 6 women required re-catheterisation. 4 were discharged with catheters left in-situ for 7 days and no one required long-term catheterisation beyond a week. Hence, majority women were able to void normally following removal of catheter 48 hours after surgery. 3 women had underlying urinary tract infection. We recommend routine screening for urinary infection preoperatively and that one could remove urinary catheter with bladder assessment as early as 48 hours after LARVH.

The rate of urinary incontinence, especially detrusor over-activity, seems to be significantly higher following radical hysterectomy ^[19]. Significant incontinence occurs in approximately 1:4 women following abdominal radical hysterectomy ^[20, 21]. Nerve-sparing during LARVH does not seem to decrease the urinary tract morbidity and approximately 1:6 women reported symptoms of stress incontinence on interview after a mean follow-up period of 38 months following LARVH ^[6]. In our series, 5 women reported urinary incontinence during follow-up.

(iv) Survival and Outcome:

The survival after LARVH seems to be similar to that after traditional abdominal surgery. The meta-analysis by Magrina ^[22] concluded an overall 5 year survival rate of 85.7% (80-90%) for stage-Ib cervical cancers who underwent radical abdominal hysterectomy. In our series the 5 year survival rate was 89%. Similar 5 year survival

rate was reported by Sardi et al ^[7]. The projected 5 year survival rate by Hertel et al ^[5] was 83% following LARVH. In a comparative study between LARVH and abdominal modified radical hysterectomy by Steed et al ^[9], the 2 year recurrence free survival was 94% and there was no difference between the two groups. The 2 year survival in our group was similar (96.7%).

(v) Conclusion:

We conclude that in carefully selected women LARVH seems to be a safe procedure associated with a reasonably low short and long-term morbidity.

Conflict of interest

The authors declare that they have no conflict of interest.

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Table 1. General characteristics and operative data

Number of Women	:	51
Mean Age (yrs)	:	39 (25-69)
Mean Parity	:	02 (0-7)
FIGO Stage	:	Stage Ib1 51
Histological Types	:	Squamous Cell 30
		Adenocarcinoma 21
Median Operating Time (min)		210 (100-340 range)
Median Nodal Yield (nodes)		23 (6-62 range)
Median Fall in Haemoglobin (g/dL)		2.4 (0.2-7.0 range)
Rate of Blood Transfusion (%)		7.5
Median time to urine residual <100ml (days)		2 (2-7 range)
Median Hospital Stay (days)		05 (1-18 range)

Table 2. Complications

<u>Early Complications :</u>	
Prolonged analgesia requirement	02
Pyrexia (>37.5°C)	04
Primary haemorrhage	02
Secondary haemorrhage	01
Pelvic collection	01
Port-site haematoma	01
Obturator Nerve Injury	01
Urinary tract infection	05
Urinary incontinence	01
Postoperative Voiding difficulty	06
<u>Late Complications :</u>	
Lymphoedema	04
Lymphocele	01
Deep vein thrombosis (DVT)	01
Urinary incontinence	04
Voiding-problems	02

Table 3. Follow-up data and adjuvant treatment

Total number followed	51	
Median duration of follow-up (months)	41 (10-104)	
Women receiving adjuvant radiotherapy	07	
Women receiving adjuvant chemo-radiation	03	
Median disease-free interval (months)	30.5	-
Mean survival time (months)	96 (88-103 ; 95% CI)	
Overall mortality	5.9%	
5 year survival rate	89%	-

Table 4. Late Complications of LARVH reported in the literature

	Steed et al ^[9]	Nam et al ^[8]	Hertel et al ^[5]	Park et al ^[18]	Sardi et al ^[7]	Renaud et al ^[18]	Our Series
Case number	71	37	200	52	56	57	51
Median follow-up (months)	17	34.5 (3-58)	40 (1-93)	45 (15-61)	48 (24-69)	36 (9-84)	41 (10-104)
Ureteric stenosis	-	-	7	1	-	-	-
Urinary fistula	2	-	2	-	-	-	-
Urinary incontinence	-	-	-	-	-	-	4
Chronic voiding difficulty	-	-	-	-	-	-	2
Lymphocele	-	2	-	-	-	-	1