

Laparoscopic-assisted vaginal hysterectomy for endometrial cancer in high body mass index (BMI) patients: a report of six cases

H. Muppala · J. Rafi · S. K. Najia

Received: 10 June 2008 / Accepted: 1 August 2008 / Published online: 3 September 2008
© Springer-Verlag 2008

Abstract In this case series, six women with high and very high body mass index (BMI; range, 30–65) underwent LAVH + bilateral salphingo-oophorectomy and removal of vaginal cuff under general anaesthesia for endometrial cancer. Initial Verres needle entry and insufflation was through the left upper quadrant at sub-coastal margin. With good surgical outcome, shorter hospitalisation and improved quality of life, we found that laparoscopic surgery was feasible in high and very high BMI patients with early stage endometrial cancer.

Keywords Endometrial cancer · High BMI · Laparoscopy · LAVH · Morbid obesity

Introduction

Endometrial cancer is the fifth most common cancer in women in the United Kingdom (UK) with around 6,430

Objective: The aim of the study was to evaluate the feasibility of laparoscopic-assisted vaginal hysterectomy in the management of early stage endometrial cancer in high and very high BMI patients.

Design: Prospective study, 2006–2007.

Setting: Royal Blackburn Hospital, Northwest England.

Main outcome measures: Success of LAVH, intra- and post-operative morbidity, and length of hospital stay.

H. Muppala (✉) · S. K. Najia
Women's Health Directorate, Royal Blackburn Hospital,
Haslingden Road, Blackburn,
BB2 3HH Lancashire, UK
e-mail: drmuppala@dochdoc.com

J. Rafi
North Manchester General Hospital,
Manchester, UK

cases diagnosed each year, which accounts for about 5% of all female cancers. There were 1,637 deaths from cancer in the UK in 2005, accounting for only 2.2% of all female cancer deaths in the UK. Incidence of uterine cancer is rising in postmenopausal women, but 5-year survival rates have improved to more than 75% [1]. Obesity and nulliparity have long been recognised as risk factors for the development of uterine cancer.

Traditional approach for staging and treatment of the endometrial cancer is mainly by an exploratory laparotomy through midline incision with total abdominal hysterectomy and bilateral salphingo-oophorectomy (TAH+BSO), peritoneal washings and/or pelvic and para-aortic lymphadenectomy [2]. With the widespread usage and experience gained from laparoscopy, this has been extended as a treatment modality for patients affected by this cancer.

In our case series, believed to be one among few early studies in UK being undertaken, we looked at scenarios of women with high and very high BMI diagnosed with endometrial cancer undergoing LAVH+BSO and removal of vaginal cuff under general anaesthesia (GA).

Materials and methods

Once suspected or diagnosed of uterine cancer, all patients were fast tracked through the system with 6-week rule for investigation and treatment. Management was based on local gynecological oncology network guidelines (Lancashire and South Cumbria cancer network). All patients had regular cervical screening with no abnormality, and none used hormone replacement therapy. They all had trans-abdominal and endo-vaginal scan followed by diagnostic hysteroscopy and endometrial biopsy (Tables 1 and 2). Cases 2 and 5 had magnetic resonance imaging (MRI) in

Table 1 Summary of patient characteristics and histopathology reports

Case no.	Age	BMI	Para	Presenting complaint and duration	Endometrial biopsy	Specimen report
1	68	64	3	PMB, 2 months	Endometrioid adenocarcinoma grade 2	Stage 1b, grade 2
2	71	30	0	PMB, 2 months	Endometrioid adenocarcinoma grade 2	Stage 1b, grade 2
3	74	40	0	PMB, 3 weeks	Mild architectural atypia	Stage 1b, grade 2
4	56	46	0	PMB, 4 weeks	Complex endometrial hyperplasia	Complex and atypical endometrial hyperplasia
5	56	45	3	PMB, 2 months	Adenocarcinoma of endometrium grade 2	Stage 1b, grade 2
6	50	34	2	Menorrhagia, 12 months	Complex atypical hyperplasia, squamous metaplasia	Stage 1a, grade 1: in the background of hyperplasia

PMB postmenopausal bleeding

view of highly suspicious-looking endometrium on hysteroscopy. Our policy is to perform MRI in all patients where cancer is diagnosed. It is avoided in patients who cannot fit into the machine or claustrophobic. All patients had preoperative follow-up in a gynaecological outpatient clinic and anaesthetic review in view of co-morbid conditions (Table 3). Preoperative investigations include full blood count, liver and renal function tests and chest X-ray were carried out. Patients were fully counselled about the advantages and disadvantages of laparoscopy, including risk of conversion to laparotomy.

They underwent LAVH+BSO with removal of vaginal cuff under GA except case 4 who did not have removal of vaginal cuff. Patients with disseminated disease and previous multiple laparotomies, which increase the chance of visceral injuries by extensive intra-peritoneal adhesions, are contraindications. All cases were discussed in the multidisciplinary meeting both pre- and post-operatively. Not all patients required pelvic drain. Drain was placed only in those cases where postoperative bleeding is suspected. Patients were catheterised for 24 h. Prophylactic intra- and post-operative antibiotics, and post-operative

thrombo-prophylaxis were given as in-patients. Vagina was packed with antiseptic ribbon gauge. Rectus sheath from the 10-mm port sites were closed with the help of J-shaped needle. Drain and pack were removed on the following morning. All women checked for post-operative haemoglobin on day 2. Routine 6-week outpatient follow-up were arranged for clinical examination. Subsequent follow-ups will be three monthly for the first year, four monthly for the second year and then six monthly for next 3 years before being discharged.

In all the cases, same surgeon (with a special interest in laparoscopy in high BMI patients) performed the operation with the help of two assistants. Patients were placed in lithotomic position. Initial entry with Verres needle for CO₂ insufflation was performed through the left upper quadrant, at the height of the dome of the lower margin of the left sub-coastal region. Verres needle is passed perpendicularly by the margin of the sub-coastal region with an initial pressure of 25 mmHg; as it traverses the abdominal layers, the pressure increases to 50 mmHg, and once it breaches the peritoneal layer, the pressure immediately drops to <9 mmHg high/free flow of the gas [3].

Table 2 Investigations performed

Case no.	Pelvic and abdominal scan	Hysteroscopy	MRI
1	ET=12.9 mm	Thickened endometrium, irregular appearance and two small polyps	
2	ET=21 mm, irregular endometrium	Enlarged cavity with suspicious-looking growth	Bulky uterus, enlarged cavity
3	ET=31 mm containing cystic areas	Enlarged cavity with irregular endometrial lining	
4	ET=3.7 mm and polyps	Enlarged cavity and multiple small polyps	
5	ET=11 mm	Thickened highly vascular endometrium and two small polyps	Endometrium of intermediate to high signal occupying the whole of the cavity extending into both cornua
6	Enlarged fibroid uterus, 125×67×81 mm, ET=12.9 mm	Multiple small polyps and hyperplastic endometrium	

MRI magnetic resonance imaging, *ET* endometrial thickness

Table 3 Co-morbidity status and post-operative data

Case no.	Co-morbid medical conditions	Post-op analgesia	Day of discharge
1	Hypertension, para-umbilical hernia, asthma, osteoarthritis	Patient-controlled epidural analgesia	7
2	Hypercholesterolemia	Paracetamol, diclofenac	3
3	Hypertension, type II DM, vertibasilar insufficiency, ischaemic heart disease, hypercholesterolemia	Paracetamol, diclofenac	3
4	Hypertension, hyperlipidemia, osteoarthritis, Meniere's disease, irritable bowel syndrome, varicose veins	Paracetamol, diclofenac	5
5	Hypertension, osteoarthritis	Patient-controlled IV morphine analgesia, paracetamol, diclofenac	3
6	Hypertension, iron deficiency anaemia	Patient-controlled IV morphine analgesia, paracetamol, diclofenac	3

After successful pneumoperitoneum, the first 10-mm port is placed in the left upper quadrant. Subsequently, three more ports (one 10 mm and two 5 mm) are placed under vision. Case two had five port entries. For improved access to pelvic cavity, we routinely used preoperative bowel preparation and, intra-operatively, endo-retractor for bowels. Short period of Trendelenberg's position were used until the upper pedicles were secured. Coagulation and cutting of the salphinges were undertaken, along with the opening of the anterior leaf of the broad ligament. Gas let out, leaving all the cannulas and camera in place for later checking of haemostasis. The rest of the procedure was carried out vaginally. Uterine pedicles were secured from below.

Results

See the summary of information in the following Tables 1, 2 and 3.

Discussion

The use of laparoscopy in cervical, endometrial and ovarian cancers has significantly improved over the last 15 years. Laparoscopic surgery for women with endometrial carcinoma was first reported by Childers and Surwit in 1991 and considered high BMI as exclusion criteria for laparoscopic staging [4]. Over the years, the experience gained with improved instrumentation and techniques; laparoscopic procedures have been generally regarded as safe and feasible in women with high BMI patients [5–7]. Stages 1a–c and 2a and b are managed by LAVH+BSO and removal of vaginal cuff +/- pelvic aortic node sampling. As per protocol advanced stages 1c and stage 2, high-grade or aggressive variants such as papillary serous or clear cell will have pelvic aortic lymph node sampling for surgical staging.

In our case series, neither procedural nor anaesthetic-related complications were encountered. However, other investigators [8] have reported abdominal wall haematomas and operative blood loss requiring blood transfusion, cuff cellulites and ileus requiring readmissions, intra-abdominal and pelvic abscesses, small bowel obstruction secondary to herniation through a 5-mm port site and septic thrombophlebitis. In view of these risk factors, we routinely gave prophylactic intra- and post-operative antibiotics for two successive days. In addition, a closed suction drain is placed into the pelvic cavity at the end of the vaginal procedure. In a prospective study involving 40 patients, conversion to laparotomy was seen in 7.5% cases with women of BMI greater than 28, but the morbidity and length of hospitalization were compared to women with low BMIs [9]. Other complications reported are small bowel obstruction secondary to herniation through laparoscopic 10-mm trocar sites, rarely through 5-mm trocar sites, cystotomy, ureteral transection, bleeding from the inferior epigastric vessels and pneumothorax [9].

No statistically significant differences in recurrence and survival rates have been noticed in short-term follow-up and have led to recommendation of laparoscopic procedures as a routine treatment option for endometrial cancer [10–13]. In a recent retrospective study involving 169 patients, the recurrence rate in the LAVH group was 8.7%, compared with 16% in the laparotomy group. In the same study, overall survival and disease-free survival for the LAVH were 93% and 91%, compared with 86% and 84% in the TAH, respectively (insignificant) [14]. In another recent retrospective study involving 273 patients, the surgical technique of an open or closed vaginal cuff during open or laparoscopic surgery for endometrial cancer showed no significant impact on the local recurrence rate [15]. Following 8 months follow-up, none of our six patients have had any complications.

The only drawback reported is longer operating time [10, 16, 17]. The operating time in all the patients was within 2 h,

except case 1 where it was 4 h in view of laparoscopic repair of umbilical hernia. Cases 2, 4 and 6 underwent additional operations of laparoscopic adhesiolysis. All our patients recuperated uneventfully from the operation, and the mean duration of hospital stay was 4 days (Table 3). None of them required blood transfusion, as the maximum drop of haemoglobin was two in case 2, indicating less intra-operative blood loss. Most women had simple analgesia for postoperative pain, paracetamol and diclofenac. Case 1 had patient-controlled epidural analgesia for 3 days; cases 5 and 6 had patient-controlled IV morphine for 1 day (Table 2). None of the patients required night sedation.

In a prospective study involving 86 non-selective patients, Eltabbakh et al. concluded that the majority of women with early stage endometrial carcinoma could be treated with laparoscopy with an excellent surgical outcome, shorter hospitalisation, earlier recovery and improved quality of life [8]. Similar findings were reported by others in non-selective patients [10, 14, 18–20]. In one retrospective review of 90 patients, laparoscopic staging appeared to be a feasible alternative to traditional abdominal surgery for stage I and stage II disease, including no difference in disease recurrence in both of the groups [21].

From the patients' point of view, there is less risk of wound infection, haematomas, pneumonia, major bleeding as well as decreased chances of deep venous thrombosis from early ambulation. In consequence, there will be shorter hospital stay, less chances of hospital-acquired infection especially methicillin-resistant *Staphylococcus aureus* and early return to full normal activity. This also means reduced overall costs and improved efficiency of hospitals from increased turnover of beds. Other investigators too noted lower hospital costs in patients undergoing laparoscopic staging [10, 22].

In conclusion, the small incisions required for laparoscopic surgery and the absence of bowel manipulation decrease postoperative pain and ileus, and allowed for early ambulation and discharge. Our experience shows that they resumed full normal activity earlier (within 2 weeks) compared to having total abdominal hysterectomy. These patients were significantly more satisfied from the good outcome of the laparoscopic surgery as avoidance of large abdominal incisions. It has been proven beyond doubt that wound infection following laparotomy in obese women poses significant morbidity. Patient motivation and multidisciplinary involvement are crucial for the good outcome in women with very high BMI patients. For above-mentioned reasons, we underscore the safety and feasibility of the laparoscopic surgery in high and very high BMI patients with early stage endometrial cancer. However, larger studies are required to draw final conclusions.

References

1. Cancer Research UK. <http://info.cancerresearchuk.org/cancerstats/types/uterus/>. Accessed September 2007
2. Volpi E, Ferrero A, Jacomuzzi ME, Carus AP, Fuso L, Martra F, Sismondi P (2006) Laparoscopic treatment of endometrial cancer: feasibility and results. *Eur J Obstet Gynaecol Reprod Bio* 124:232–236
3. Muppala H, Rafi J, Najia SK (2008) Laparoscopic insufflation through a defined surgical point in the left upper quadrant: a three year experience. *Gynecol Surg* (in press). doi:10.1007/s10397-008-0397-7
4. Childers J, Surwit E (1991) A combined laparoscopic vaginal approach in the management of stage I endometrial cancer. *Gynecol Oncol* 45:46–51
5. Eltabbakh GH, Piver MS, Hempling RE, Recio FO (1999) Laparoscopic surgery in obese women. *Obstet Gynecol* 94:704–708
6. Pasic R, Levine RL, Wolf Jr WM (1999) Laparoscopy in morbidly obese patients. *J Am Assoc Gynecol Laparosc* 6(3):307–312
7. Heinberg EM, Crawford BL III, Weitzen SH, Bonilla DJ (2004) Total laparoscopic hysterectomy in obese versus nonobese patients. *Obstet Gynecol* 103(4):674–680
8. Eltabbakh GH, Shamonki MI, Moody JM, Garafano LL (2001) Laparoscopy as the primary modality for the treatment of women with endometrial carcinoma. *Cancer* 91:378–387
9. Eltabbakh GH, Shamonki MI, Moody JM, Garafano LL (2000) Hysterectomy for obese women with endometrial cancer: laparoscopy or laparotomy? *Gynecol Oncol* 78(3):329–335
10. Gemignani ML, Curtin JP, Zelmanovich J, Patel DA, Venkataramana E, Barakat RR (1999) Laparoscopic assisted vaginal hysterectomy for endometrial cancer: clinical outcomes and hospital charges. *Gynecol Oncol* 73(1):5–11
11. Malur S, Possover M, Michels W, Schneider A (2001) Laparoscopic assisted vaginal versus abdominal surgery in patients with endometrial cancer—a prospective randomised trial. *Gynecol Oncol* 80:239–244
12. Obermair A, Manolitis TP, Leung Y, Hammond IG, McCartney AJ (2004) Total laparoscopic hysterectomy for endometrial cancer: patterns of recurrence and survival. *Gynecol Oncol* 92:789–793
13. Tozzi R, Malur S, Koehler C, Schneider A (2005) Laparoscopy versus laparotomy in endometrial cancer: first analysis of survival of a randomised prospective study. *Journal of Minimally Invasive Gynecology* 12:130–136
14. Kalogiannidis I, Lambrechts S, Amant F, Neven P, Van Gorp T, Vergote I (2007) Laparoscopic assisted vaginal hysterectomy in clinical stage I endometrial cancer: safety, recurrence and long-term outcome. *Am J Obstet Gynecol* 196(3):248.e1–248.e8
15. Kohlberger P, Nowotny G, Speiser P, Joura E, Sliutz G, Heffler L, Reinthaller A (2007) Surgical treatment of endometrial cancer: closure or non closure of the vagina affect the local recurrence rate? *Anticancer Res* 27(3B):1589–1591
16. Scribner DR Jr, Mannel RS, Walker JL, Johnson GA (1999) Cost analysis of laparoscopy versus laparotomy for early endometrial cancer. *Gynecol Oncol* 75:460–463
17. Fram KM (2002) Laparoscopically assisted vaginal hysterectomy versus abdominal hysterectomy in stage I endometrial cancer. *Int J Gynecol Cancer* 12:57–61
18. Liauw L, Chung YN, Tsoi CW, Pang CP, Cheung KB (2003) Laparoscopy for the treatment of women with endometrial cancer. *Hong Kong Med J* 9(2):108–112
19. Frigerio L, Gallo A, Ghezzi F, Trezzi G, Lussana M, Franchi M (2006) Laparoscopic assisted vaginal hysterectomy versus ab-

- dominal hysterectomy in endometrial cancer. *Int J Gynaecol Obstet* 93(3):209–213
20. Tollund L, Hansen B, Kier JJ (2006) Laparoscopic assisted vaginal versus abdominal surgery in patients with endometrial cancer stage 1. *Acta Obstet Gynecol Scand* 85(9):1138–1141
 21. Zapico A, Fuentes P, Grassa A, Aranz F, Otazua J, Cortes-Prieto J (2005) Laparoscopic assisted vaginal hysterectomy versus abdominal hysterectomy in stage I and II endometrial cancer: operating data, follow up and survival. *Gynecol Oncol* 98(2): 222–227
 22. Spirtos NM, Schlaerth JB, Gross GM, Spirtos TW, Schlaerth AC, Ballon SC (1996) Cost and quality of life analysis of surgery for early endometrial cancer: laparotomy versus laparoscopy. *Am J Obstet Gynecol* 174:1795–1800