Robotic radical parametrectomy: a single institution experience

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ABSTRACT

OBJECTIVE: To evaluate the feasibility and safety of robotic radical parametrectomy (RRP) and pelvic lymphadenectomy for the management of occult invasive cervical cancer.

METHODS: We conducted a retrospective study enrolling patients with occult invasive cervical cancer submitted to RRP and pelvic lymphadenectomy at "Regina Elena" National Cancer Institute in Rome from August 2010 to December 2013.

RESULTS: A total of 4 patients were enrolled in the study. Total operative time was 145 minutes (range, 135 – 150 minutes). Blood loss was 100 ml (range, 50 – 150 ml) and there were no intra and post-operative complications. The median number of removed lymph nodes was 24 (range, 10 – 40). The patients were discharged home on postoperative day 3 (range, 2 – 4 days). At a follow-up of 30 (range 8 – 49) months there is no evidence of disease.

CONCLUSION: Radical parametrectomy with pelvic lymphadenectomy is indicated in case of occult and under staged cervical cancer and can be performed successfully by robotic approach. Short hospital stay, little haemoglobin drop, absence of complications and the radicality of procedure showed by the length of the parametria removed and the number of lymph nodes dissected demonstrated the feasibility of the procedure.

Keywords: Parametrectomy, mini invasive surgery, cervical cancer

SOMMARIO

OBIETTIVI: Valutare la fattibilità e la sicurezza della parametrectomia radicale robotica associata alla linfadenectomia pelvica nel management del cervicocarcinoma invasivo occulto.

METODI: Il nostro è uno studio retrospettivo che ha coinvolto pazienti affette da cervicocarcinoma occulto invasivo e sottoposte a parametrectomia radicale robotica associate a linfadenectomia pelvica presso l'Istituto Nazionale Tumori "Regina Elena" di Roma da Agosto 2010 a dicembre 2013.

RISULTATI: Abbiamo considerato un totale di 4 pazienti. Il tempo operatorio medio è risultato pari a 145 minuti (range, 135-150 minuti). Le perdite ematiche sono risultate in media pari a 100 ml (range, 50-150 ml). Non ci sono state complicanze intra o postoperatorie. Il numero dei linfonodi asportati è stato in media di 24 (range, 10-24). Le pazienti sono state dimesse in seconda giornata post-operatoria (range, 2-4 giorni di ricovero). Ad un follow-up di 30 mesi (range 8-49 mesi) non abbiamo registrato recidive di malattia.

CONCLUSIONI: La parametrectomia radicale associata alla linfadenectomia pelvica trova indicazione nel trattamento del cervicocarcinoma occulto invasivo o nel cervicocarcinoma "under staged" e può essere condotta con successo scegliendo un approccio robotico. La fattibilità della procedura è dimostrata dalla breve degenza media, dalle scarse perdite ematiche rilevate, dall'assenza di complicanze e dalla radicalità dell'intervento dimostrata dall'ampiezza dei parametri rimossi e dal numero di linfonodi asportati.

Parole chiave: Parametrectomia, chirurgia mini invasiva, cancro cervicale

INTRODUCTION

It's quite rare to find out an unexpected cervical cancer at an simple hysterectomy carried out for benign conditions or pre-invasive cervical pathologies but represent a discussed problem that need further treatments. Most frequent indications for simple hysterectomy included squamous intraepithelial neoplasia (CIN) or carcinoma in situ (CIS), uterine leiomyomatosis and adenomiosis. The rate of occult cervical cancer detection is not clear, although it seems to comprise 5.3% of all cervical cancers[(1)]. For stage IAI no adjuvant treatment is required, more advanced early-stage lesions (stage IA2–IIA), need further therapy because the elevated risk of recurrence of these patients. Two different choices of adjuvant treatment are reported in literature: radiotherapy (or brachytherapy) and surgical resection of parametria, upper vagina and pelvic lymph nodes bilaterally[(2)]. First approach is associated with a high percentage of compliances especially on rectal and bladder function and could not be recommended for young women that represent the great part of the cases. The surgical approach is *limitated* to the *need* to resort to a laparotomy. Recently, with the progress of the minimally invasive surgery, some authors described series of laparoscopic parametrectomies indicated as a safe and feasible

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treatment option[3]. The purpose of the present study was to evaluate the feasibility and safety of robotic radical parametrectomy (RRP) and pelvic lymphadenectomy for the management of occult invasive cervical cancer.

MATERIAL AND METHODS

Starting from August 2010, all consecutive patients referred to our Division of Gynaecologic Oncology with diagnosis of occult invasive cervical cancer have been included in this retrospective study. Inclusion criteria were as follows: patients with occult invasive cervical cancer, who underwent prior simple hysterectomy, were required to have a normal pelvic examination without evidence of macroscopic residual of disease on the vaginal cuff and without suspicious involvement of the parametria. The pre-operative workup included: the collection of the medical history, physical and vaginal-pelvic examination, complete blood analysis, chest X-ray and magnetic resonance imaging (MRI) scans of the abdomen. All eligible women received a detailed counselling session including the two alternatives of treatment: reoperation vs. radiotherapy. Informed written consent was obtained from each patient.

SURGICAL PROCEDURE

All the operations included in the study were perfomed by the same surgical team (E.V; G.C.; G.C) who have an optimal laparotomic and laparoscopic training. All patients have antibiotic prophylaxis (Augmentin 2.2 g intravenously) and perioperative low molecular weight Enoxaparin (40 mg/24 h subcutaneously). The vaginal cavity is cleansed with povidone iodine solution and a Foley catheter is placed in the bladder. In addition, intraoperative lower extremity sequential compression devices for venous thrombosis prophylaxis are used. All procedures were performed under general endotracheal anesthesia. The surgical technique has already been described in previous reports[4]. The robotic aortic lymphadenectomy was reserved to patients with pelvic nodes disease at intra-operative examination or founding of bulky aortic nodes at the time of surgery[5] in order to determine the field of postoperative radiation. Operating time was defined from the beginning of skin incision to completion of skin closure. The estimated blood loss (EBL) was calculated by the difference in the total amounts of suctioned and irrigation fluids.

RESULTS

Between August 2010 and December 2013 four patients were enrolled in the study (table I). All patients were submitted to RRP for an occult cervical cancer at index hysterectomy (two stage IA_2 and two stage Ib_1 according to the FIGO staging)[6]. The median age was 40 years (range, 38 – 41), median BMI was 24 kg/m^2 (range,15–30 kg/m^2). No procedure required conversion to lapparoscopy or laparotomy.

The surgical outcomes are summarized in table II. The median operating time was 145 minutes (range, 135 – 150 minutes). The median blood loss was 100ml (range, 50 – 150ml) while the median drop of Haemoglobin was 1g/L (range, 0.5 – 2g/L) before and 24 hours after operation. None of the patients required intra-operative or post-operative blood transfusion. The median number of removed pelvic lymph nodes was 24 (range, 10 – 40). The adenocarcinoma patient had one positive pelvic node at frozen section. In this patient, lymphadenectomy was extended to the para-aortic nodes, with negative specimens. The superior border of the dissection in the para-aortic lymphadenectomy was the inferior mesenteric artery and the number of removed para-aortic lymph nodes was 7.

The median length of dissected vagina was 21 mm (range, 15 – 35 mm). The median width of parametrium was 30 mm on the right side (range, 15 – 50 mm) and 30 mm on the left side (range, 15–60) (Figure 1). The surgical margins were free of disease in all cases.

There were no intra and post-operative complications. The patients were discharged home

Table I.
Clinical characteristics.

Characteristics	Patients
Median Age (years)	40 (38 – 41)
Median BMI (kg/m^2)	24 (15 – 30)
Previous abdominal surgery	2 (50%)
Histology Squamous Adenocarcinoma	 3 (75%) 1 (25%)
FIGO stage IA_2 IB_1	 2 (50%) 2 (50%)
Grading G2 G3	 3 (75%) 1 (25%)

Table II.
Surgical outcome.

Characteristics	TRRH
Median operative time (min)	145 (135 – 150)
Median blood loss (mL)	100 (50 – 150)
Median pelvic lymph nodes	24 (10 – 40)
Median width right parametrium (mm)	30 (15 – 50)
Median width left parametrium (mm)	30 (15 – 60)
Median length vaginal cuff (mm)	21 (15 – 35)
Major intraoperative complications	0
Major early postoperative complications	0
Major late postoperative complications	0
Blood transfusion	0
Conversion to laparoscopy or laparotomy	0
Reoperation	0
Median hospital stay (days)	3 (2 – 4)

Figure 1.
Surgical specimen from robot-assisted radical parametrectomy and colpectomy.

on postoperative day 3 (range, 2 – 4 days).

Adjuvant therapies were individualized after a multidisciplinary consultation and only one woman with adenocarcinoma FIGO stage IB_1 with one positive pelvic lymph node received cisplatin-based concurrent chemo-radiation.

At a follow-up of 30 (range 8 – 49) months there is no evidence of disease.

DISCUSSION

Even if it's quite rare an early stage cervical cancer found out after a simple hysterectomy needs further treatments and it can't be neglected. These patients are usually young women in fertile age submitted to hysterectomy for benign conditions such as adenomiosis or fibromatosis or for non-invasive cervical pathologies. The overall survival in that case (FIGO stage IA2-IB1) treated with simple hysterectomy is less than 50% at 5 years[7] so that, with the exception of cervical cancer FIGO stage IA1 that no require adiuvant treatment, more advanced early stage lesions represent a category of patient at a very high recurrence risk of and need further care. Wright et al. underlined this risk investigating the parametria of 594 patients who underwent radical hysterectomy for invasive cervical cancer found out a total of 10.8% of parametrial metastasis when 78% of patients were FIGO stage IB_1[8]. Considering early stage occult cervical cancer the treatment options indicated are radiotherapy or a reoperation involving parametrectomy, pelvic or paraaortic lymphadenectomy and upper colpectomy[9]. External beam radiotherapy is associated with several complications. Smith et al. reported on a series of 25 patients an overall survival of 100% at 5 years but an overall grade 2 to 5 complications rate of 36% (9 of 25) and grade 4 or 5 complications of 20% (5 of 25)[10].

Since radiotherapy results in loss of ovarian function, very high percentage of complications and greater frequency of sexual dysfunction than operative techniques, parametrectomy seems more beneficial option especially for young women. For a long time the need to resort to laparotomy limited this operation to the patients who can't bear the complications of radiotherapy, nowadays the introduction of minimally invasive technique allow microsurgery procedures preserving radicality. Buda et al.[3] report twelve cases of laparoscopic radical parametrectomy, upper vaginectomy and pelvic lymphnodes dissection for invasive cervical cancer accidentally discovered after simple hysterectomy. Most of the patient were 1B1 stage (11/12 patients) and in 75% (9 of the 12 patients) they avoid radiotherapy. Neither major intraoperative complications nor blood transfusions are reported.

Ramirez et al.[12] (Table 1) firstly described the experience of 5 robotic parametrectomy and pelvic lymphadenectomy performed for an unexpected early stage invasive cervical cancer. He report the same percentage of intra and post-operative complications of laparotomy and laparoscopy approach but better results in term of need of blood transfusion and length of hospitalization. He affirms that the robotic approach to parametrectomy is feasible and potentially promising for its great precision in the movements that allow complete dissection and an optimal oncological radicality. Frey MK et al.[13] published a case report of a robotic parametrectomy in 2011 describing this technique as feasible ad secure, a valid alternative to laparoscopy. The most extensive up-to-date about robotic radical parametrectomy was published by Vitobello D. et al in 2012[4], where he described a large casistic of 11 patients treated between 2007 and 2012 affected from occult cervical cancer (5/11), from cervical adenocarcinoma (2/11) and from recurrence of endometrial cancer (4/11), respectively. They did record neither blood transfusion nor conversion to laparotomy and median blood loss was comparable with the other paper. They had a prolonged hospital stay (median 3 days, rage 3 to 4 days) but they described a major intra-operative complication (a bladder injury that was intra-operatively sutured) that probably needed a prolonged hospitalization and influenced the median value. Three women of their group needed an adjuvant therapy (radiotherapy, chemotherapy and a concurrent radio-chemotherapy) after the operation but only one recurrence was detected after a 19 months of median follow-up time.

In conclusion, our findings suggest and confirm that, in skilled hands, robotic surgery can be successfully and safely applied to accomplish radical parametrectomy with pelvic lymphadenectomy for the management of occult cervical cancer.

COMPETING INTERESTS

The authors report no conflicts of interest. The authors are responsible for the content and writing of the paper.

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Table III.
Literature review of studies regarding robotic radical parametrectomy.

	N° patients	Hystology/ FIGO stage	Blood loss (ml)	Hospital stay (days)	Operative time (min)	N° Lymph nodes	Adiuvant therapy
Magrina J.F. [11]	1	CAC	145	2	330	Done in the previous operation	None
Frey MK. [13]	1	EAC IIB	200	1	-	14 pelvic, 9 para-aortic	None
Ramirez P. [12]	5	SCC IA2 (2/5), SCC IB1 (3/5)	100 (range, 50-175)	1 (range, 1-2)	365 (range, 331- 430)	14 (range, 6-16)	None
Vitobello D. [4]	11	SCC (5/11) CAC (2/11) EAC (4/11)	100 (range, 10-200)	3 (range, 3-4)	262 (range, 115- 352)	24 (range, 14-46)	Three (1 RT, 1 CT, 1 RCT)

SCC: squamous cervical cancer; CAC: cervical adenocarcinoma; EAC: endometrial adenocarcinoma; RCT: radiochemotherapy; RT: radiotherapy; CT: chemotherapy

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