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RESEARCH ARTICLE

Laparoscopic Versus Laparotomy Approach in Surgical Treatment of Endometrial Cancer: Pelvic Lymphadenectomy Results

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Abstract

Aim: Compare the efficacy of laparoscopic versus laparotomy approach in women with early stage endometrial adenocarcinoma.

Methods: Case control retrospective study of 226 women treated of early endometrial cancer. 79 patients in the laparoscopy group and 147 in the laparotomy group. Variables analyzed in both groups were patient age, body mass index, duration of follow-up, FIGO 2009 surgical stage, tumor grade, histopathologic type, number of lymph nodes yielded, operating time, postoperative hospital admission, perioperative and postoperative complications, conversion to laparotomy, recurrence, and survival. Statistical analysis was performed using SPSS version 20.0. The Student t test was used to compare the mean values of continuous variables, and the X^2 test was used to compare categorical variables.

Results: There were no significant differences in age, weight, body mass index, parity, previous abdominal surgery, number of lymph nodes yielded and menopausal status between the laparoscopy and the laparotomy groups. There were no statistically significant differences in the numbers of nodes and node metastases obtained in the laparoscopy and the laparotomy groups. The operating time was shorter in the laparotomy group. Intraoperative and postoperative complications were significant less frequent in laparoscopy group (13.9% vs. 32.5%; P = 0.003). Women had a similar 5 years estimated recurrence-free survival (98% in laparoscopy vs. 94% laparotomy group) and similar 5 years overall survival rates (100% in laparoscopy vs. 95% laparotomy group).

Conclusion: Laparoscopy is safe, and has almost equal efficiency than laparotomy approach in treatment of women with early stage endometrial cancer.

Introduction

Endometrial cancer is the most commonly reported gynecologic malignance in developed countries. Recently, endoscopic surgery has been applied for treating gynecologic malignancies. In particular, laparoscopy has been widely proposed instead of laparotomy for the treatment of women with endometrial cancer [1-3].

Compared with laparotomy, laparoscopy has been shown to be associated with many advantages such as smaller incision, better visibility of the operative field, minimal intraoperative blood loss, less postoperative pain, shorter hospital admission, and earlier return to work [1-3]. Obeseness is not a contraindication [4,5] and elderly women [6] could also benefit from laparoscopic approach.

The efficacy and safety of the laparoscopic approach to treat endometrial cancer have been established by many studies [1,7] and meta-analyses [8,9]. These publications were performed by prestigious oncologic centers with a long period of expertise in the endoscopic field [1,10], although most of them are limited to the treatment of early-stage endometrial cancer [1,4,11].

Furthermore, in the last decade, several studies have demonstrated that laparoscopy is superior to laparotomy in reducing postoperative ileus, wound infec-

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tion, fever, and postoperative admission, and all these factors contribute to a reduction in morbidity [12,13]. However, because most studies [12,13] only followed up small groups of patients for a limited period it was difficult to properly evaluate complications, recurrence, and survival associated with laparoscopy.

The aim of our study was to compare the efficacy of a laparoscopic versus laparotomy approach in women with early stage endometrial adenocarcinoma who were followed during a period at least of 25 years.

Material and Methods

We retrospectively analyzed the medical records of all patients with endometrial adenocarcinoma who underwent a laparoscopic or open surgery for staging endometrial cancer at University Hospital Sant Joan de Deu from January 1988 to December 2013. The study was approved by the Ethics Committee. It was not possible to obtain the informed consent of all the patients due to the duration of the study.

Inclusion criteria were as follow: The presence of histopatologically confirmed endometrioid adenocarcinoma treated with standard surgical staging consisting in peritoneal washing and total hysterectomy (including both totally laparoscopic/abdominal approach and laparoscopically assisted vaginal approach) with bilateral salpingo-oophorectomy and pelvic lymphadenectomy.

Exclusion criteria were the finding of a different histological type than endometrioid adenocarcinoma, the absence of complete clinical and histological data, having not undergone a total hysterectomy or if the hysterectomy was performed vaginally.

Patient data were distinguished in the 2 groups on the basis of surgical treatment received, that is, totally laparoscopic and laparoscopically assisted vaginal approach (laparoscopy group) or laparotomy (laparotomy group).

We recorded parameters including patient age, Body Mass Index (BMI), duration of follow-up, existence of chronic disease, previous history of laparotomy, International Federation of Gynecology and Obstetrics surgical stage (FIGO 2009), tumor grade, tumor size, histopathologic type, number of lymph nodes yielded, operating time, postoperative hospital admission, perioperative and postoperative complications, conversion to laparotomy, recurrence, and survival.

Statistical analysis was performed using SPSS version 20.0. The Student t test was used to compare the mean values of continuous variables, and the X^2 test was used to compare categorical variables. To improve the normality of the skewed distributions of the continuous variables, some variables that were not normally distributed were logarithmically transformed, and then the Student t test was used. Recurrence-Free Survival (RFS) and Disease-Free Survival (DFS) of the laparotomy and laparoscopy groups were obtained by the Kaplan-Meier method, and the log-rank test was used to compare survival outcomes. DFS was calculated from the date of operation of endometrial cancer to the date of death due to endometrial cancer or recurrence, whichever occurred first. Differences between groups were considered statistically significant at $P < 0.05$. All P values were 2-sided.

Results

Of the 282 patients who were surgically staged with endometrial cancer from January 1988 to December 2013, 3 patients were performed vaginal hysterectomy and were excluded. Of the 279 patients after inclusion/exclusion criteria were applied, 53 patients were excluded. Thus, a total of 226 patients were analyzed, 79 patients in the Laparoscopy group (LPS) and 147 in the Laparotomy group (LPT).

Patients' characteristics are listed in Table 1. There were no significant differences in age, weight, body

Table 1: Baseline characteristics of patients.

	LPS§ n = 79	LPT¶ n = 147	p
Age			
Mean ± SD	60.27 ± 9.47	63.07 ± 10.74	0.052
Range	36-80	35-88	
BMI‡			
Mean ± SD	31.20 ± 4.28	32.61 ± 4.76	0.070
Range	23.6-39	24.8-42.6	
Menopause			
Premenopause	12 (15.2%)	22 (14.6%)	1
Postmenopause	67 (84.8%)	125 (85.4%)	
Previous abdominal surgery			
Mean ± SD	0.44 ± 0.59	0.37 ± 0.49	0.33
Range	0-2	0-3	
Chronic hypertension	34 (43%)	70 (46.4%)	0.67
Diabetes	18 (22.7%)	41 (27.2%)	0.9

§Laparoscopy; ¶Laparotomy; ‡Body Mass Index.

mass index, parity, previous abdominal surgery and menopausal status between the laparoscopy and the laparotomy groups. The presence of chronic disease (Chronic hypertension and Diabetes) was similar between the two groups. The grade and surgical stage was also similar between the laparoscopy and the laparotomy groups (Table 2).

Before surgery, a Magnetic Resonance (MR) was performed in order to evaluate the risk of miometrial, cervix or lymph node invasion. In patients with suspected invasion pelvic lymphadenectomy was performed.

Fifty eight (73.4%) of the 79 patients and 77 (52.1%)

Table 2: Surgical stage and grade.

	LPS n = 79	LPT n = 147	p
Stage (FIGO 2009), n (%)			0.017
IA	46 (58.2)	112 (76.9)	
IB	30 (38)	28 (19)	
II	3 (3.8)	7 (4.7)	
Total	79	147	
Grade, n (%)			0.094
1	42 (53.2%)	91 (61.3)	
2	30 (38)	37 (25.1)	
3	7 (8.8)	19 (12.9)	
Total	79	151	

of the 147 patients had pelvic lymphadenectomy in the laparoscopy and the laparotomy groups, respectively, and there were no differences in the number of nodes involved between the laparoscopy and laparotomy groups (1.7% vs. 3.8%; P = 0.17). The mean of pelvic nodes obtained was respectively 10.7 (1-27) in the laparoscopy group and 10.6 (1-42) in laparotomy group (Table 3). There were no statistically significant differences in the numbers of nodes obtained in the laparoscopy and the laparotomy groups. The operating time was shorter in the laparotomy group (143.8 [45-265] vs. 211.5 [100-325] minutes; P < 0.001). However, the postoperative hospital admission was shorter in the laparoscopy group (4.1 [2-10] vs. 7.5 [3-27] days; P < 0.001). More lymphadenectomy procedures were made in laparoscopic group due to higher percentage of FIGO stage IB in this group (Table 2).

There were significant differences in intraoperative or postoperative complications between the laparoscopy and the laparotomy groups (13.9% vs. 32.5%; P = 0.003) (Table 4). Seven cases of incisional hernias and 4 cases of wound dehiscences were noted in the laparotomy group, and 7 cases of conversion to laparotomy were noted in the laparoscopy group. There were 10 cases of wound infection in the laparotomy group compared with 2 in the laparoscopy group, and there were 8

Table 3: Surgical procedures and pelvic lymph nodes.

	LPS n = 79	LPT n = 147	p
Type of procedure, n (%)			< 0.001
TH*	5 (6.3)	3 (2%)	
TH + BSO**	16 (20.3)	67 (45.5)	
TH + BSO + PLND#	58 (73.4)	77 (52.3%)	
No. of pelvic lymph nodes, n (%)			0.97
Mean ± SD	10.7 ± 5.9	10.67 ± 8.6	
Range	1-27	0-42	
Positive lymph nodes	1 (1.7%)	3 (3.8%)	

*Total histerectomy; **Bilateral salpingo-oophorectomy; #Pelvic lymph adenectomy.

Table 4: Perioperative outcomes and complications.

	LPS n = 79	LPT n = 147	p
Operating time			
Mean ± SD	211.52 ± 52.62	143.83 ± 41.57	< 0.001
Range	100-325	45-265	
Postoperative hospital day			
Mean ± SD	4.05 ± 1.22	7.54 ± 3.32	< 0.001
Range	2-10	3-27	
Patients with complications, n (%)			0.003
Wound infection	2 (2.4)	10 (6.8)	
Abdominal wall hematoma	2 (2.4)	2 (1.3)	
Wound dehiscence	0 (0)	4 (2.7)	
Postoperative ileus	0 (0)	5 (3.4)	
Vascular injury	1 (1.2)	3 (2)	
Intestinal injury	1 (1.2)	2 (1.3)	
Urinary tract injury	2 (2.4)	4 (2.7)	
Incisional hernia	2 (2.4)	7 (4.7)	
Hemoperitoneum	0 (0)	4 (2.7)	
Urinary tract infection	1 (1.2)	8 (5.4)	
Total	11 (13.9)	49 (33.3)	

Table 5: Recurrence and survival outcomes.

	LPS n = 79	LPT n = 147	p
Recurrence, n (%)	1 (1.2)	9 (5.9)	0.099
5 years recurrence-free survival (%)	98%	94%	0.3
5 years overall survival rates (%)	100%	95%	0.4

cases of urinary tract infection in the laparotomy group compared with 1 case in the laparoscopy group.

Adjuvant therapy was radiotherapy (brachytherapy or/and external radiotherapy). This treatment did not differ in both groups, and it was applied in case of deep miometrial invasion, grade 3 tumors, cervix involvement or nodes metastases.

One patient in the laparoscopy group (1.2%) and 8 patients in the laparotomy group (5.5%) had recurrence of the disease; this difference was not statistically significant (P = 0.099; Table 5).

Women who underwent laparoscopy and those who underwent laparotomy had similar 5 years estimated recurrence-free survival rates (98% vs. 94% respectively) as well as similar 5 years overall survival rates (100% vs. 95% respectively) (Table 5).

Discussion

Surgical treatment of endometrial cancer has been traditionally performed by laparotomy approach to accomplish a Total Abdominal Hysterectomy (TAH) and of retroperitoneal lymph nodes staging [14]. Childers and Surwit [15] were the first authors to report the use of Laparoscopically Assisted Vaginal Hysterectomy (LAVH) with laparoscopic staging of pelvic and paraaortic lymph nodes in 1992 for treatment of early-stage endometrial cancer. Since that time, numerous authors have reported their institutional experience with laparoscopic surgery for endometrial cancer [16-18].

Our present study with 226 patients with endometrial cancer followed over the long period of 25 years provides significant information about the efficacy and complications of patients with endometrioid cancer histological type and stage I and II FIGO 2009 who underwent surgery.

In the present study, there were no significant differences between 2 groups (LPS vs. LPT) in the grade of the tumor and FIGO stage of endometrial cancer (Table 2). Although several studies [14,19,20] have suggested that the grade of the tumor and the histological type could draw the indication for the surgical approach. In our study, the surgical approach was not influenced by the grade of the tumor.

As expected, in the current analysis, patients with endometrial cancer higher than stage I were more likely to undergo laparotomy without being a statistically significant difference. However, in about 4% of endometrial cancers with FIGO stage II of our study, the laparoscopy

approach was performed, and in all of them, it was successfully concluded without conversion to laparotomy.

In our study the percentage of patients with pelvic lymphadenectomy was similar in laparoscopy and laparotomy group (73.4% vs. 52.1% respectively) other studies with larger number of patients had a few patients with lymphadenectomy in laparoscopic group (16% vs. 45%) [21]. Percentage of positive pelvic lymph nodes was very low in both groups 1.7 and 3.8% respectively, in all the cases risk factor for lymph nodes metastases were present (deep miometrial invasion, G3 and lymphovascular space involvement) [22]. In our study we only perform pelvic lymphdenectomy in women with an early stage endometrial carcinoma and endometrioid histology because, only 2% of patients with negative pelvic lymph nodes had positive paraortic [23] and when techniques for detecting sentinel lymph node are used in endometrial cancer staging most of the lymph nodes detected are situated into the pelvis [24].

Some studies [25] observed a similar duration of surgery performed laparoscopy or laparotomy, in our case laparoscopy group had significant long operating time than laparotomy group although the surgical period was shorter after the first cases (surgeon learning curve).

We conclude as other studies [14,26] that there is no difference in overall survival in patients with endometrial cancer treated by laparoscopy or laparotomy in early FIGO (stage I or II). Adjuvant therapy with radiotherapy does not affect to overall survival of both groups as we see in other studies of the literature [27,28].

Laparoscopy group benefits from less complication associated with surgery, shorter hospital admission and earlier recovery. Laparoscopy is safe, and has almost equal efficiency than laparotomy approach in treatment of women with early stage endometrial cancer.

One of the weaknesses of the study is the retrospective nature; randomized studies with larger number of patients are needed to confirm our results.

Disclosure

All the authors declare that there are not any financial or personal relationships with other people or organizations that could inappropriately influence (bias) our work.

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