

Laparoscopic Radical Trachelectomy

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ABSTRACT

Introduction: The standard treatment for patients with early-stage cervical cancer has been radical hysterectomy. However, for women interested in future fertility, radical trachelectomy is now considered a safe and feasible option. The use of minimally invasive surgical techniques to perform this procedure has recently been reported.

Case Description: We report the first case of a laparoscopic radical trachelectomy performed in a developing country. The patient is a nulligravid, 30-y-old female with stage IB1 adenocarcinoma of the cervix who desired future fertility. She underwent a laparoscopic radical trachelectomy and bilateral pelvic lymph node dissection. The operative time was 340 min, and the estimated blood loss was 100mL. There were no intraoperative or postoperative complications. The final pathology showed no evidence of residual disease, and all pelvic lymph nodes were negative. At 20 mo of follow-up, the patient is having regular menses but has not yet attempted to become pregnant. There is no evidence of recurrence.

Conclusion: Laparoscopic radical trachelectomy with pelvic lymphadenectomy in a young woman who desires future fertility may also be an alternative technique in the treatment of early cervical cancer in developing countries.

Key Words: Laparoscopic radical trachelectomy, Cervical cancer, Fertility sparing procedure.

INTRODUCTION

The standard treatment for patients with early-stage cervical cancer (IA2 and IB1) has been radical hysterectomy. However, for women interested in future fertility, a radical trachelectomy is now considered a safe and feasible option. The abdominal radical trachelectomy was introduced by Smith and colleagues in 1997.¹ The procedure can be performed using a vaginal or an abdominal approach, with comparable oncologic outcomes. The abdominal approach allows surgeons who have not had extensive training in radical vaginal surgery to perform this procedure. Our group previously showed that the abdominal radical trachelectomy is also a safe and feasible procedure in the setting of a developing country.²

The first laparoscopic abdominal radical trachelectomy was performed by Lee and colleagues.³ Since that time, other investigators have published their experience with this approach.^{4–8} In this article, we report the case of a patient who underwent a laparoscopic radical trachelectomy and review the results of similar procedures published in the literature.

CASE REPORT

A 30-y-old woman Gravida 0, presented to the Gynecology Oncology Unit, Instituto de Cancerología – Clínica Las Américas in May 2009 with a papanicolaou test showing an ASCUS result. On physical examination, the cervix showed no gross lesions. Colposcopy was performed and biopsy showed grade 2 endocervical adenocarcinoma with 6mm of invasion. No conization was performed given the results of invasive adenocarcinoma in the biopsy. On palpation, the vaginal fornices and parametria did not have any evidence of disease. A diagnosis of a stage IB1 endocervical adenocarcinoma was made. The patient was offered a radical hysterectomy, and was also given the option of a radical trachelectomy given her age and nulliparity. The patient was also given the option of a laparoscopic approach to perform this procedure. The patient did not undergo a preoperative MRI due to limited access to this technology for some patients in Colombia. However, when possible, we consider that MRI should remain the modality of choice to evaluate upper cervical

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involvement in patients due to undergo a radical trachelectomy.

The patient underwent a laparoscopic radical trachelectomy and pelvic lymph node dissection in June 2009. Briefly, the procedure was performed by first placing a V-Care manipulator (Utica, NY) in the uterus. A supraumbilical incision was made and a Veress needle (Ethicon, Somerville, NJ, USA) was placed. The abdomen was insufflated using CO₂ with a pressure of 15mm Hg. We used 5 trocars (Ethicon), the first 10-mm was placed at the supraumbilical puncture site, two 5-mm trocars each were placed in the right and left lower quadrants, respectively, and two 5-mm trocars each were placed in the right and left upper quadrants at the level of the umbilicus, respectively. The patient was placed in a steep Trendelenburg position.

Rectovaginal spaces were entered and widened by blunt dissection. Paravesical and pararectal spaces were developed. Pelvic retroperitoneal space was dissected. The round ligaments were preserved. Systematic bilateral pelvic lymphadenectomy (internal iliac, external iliac, and obturator) was performed. Intraoperative frozen section evaluation of the lymph nodes did not reveal any evidence of disease. Uterine arteries were coagulated and cut at the level of hypogastric artery with a bipolar coagulator (Aesculap AdTec bipolar, B. Braun, Tuttlingen, Germany). The bladder peritoneum was incised and the vesicouterine space was dissected from the upper vagina. The ureters were freed from the peritoneal attachments and parametrium-paracolpium. Bladder was sharply dissected from parametria exposing bladder pillars, which were coagulated and resected at the posterior wall of the bladder. Uterosacral ligaments were coagulated and cut. A monopolar hook (Karl Storz, Tuttlingen, Germany) was used to amputate the cervix 1cm below the isthmus. The specimen including cervix, bilateral parametria, and upper vaginal margin was removed through the vagina. The frozen section biopsy revealed no involvement of the superior margin with invasive or in situ adenocarcinoma. Seromuscular edge of resected uterine corpus was fixed to the proximal vaginal vault with a continuous running suture using 2-0 polyglactin (Vicryl). This was performed using a vaginal approach. There was no cerclage placed. We do not routinely place a cerclage, because we feel that it may add to the risk of immediate postoperative complications, particularly cerclage erosion through the site of the anastomosis. In our practice, patients who are able to conceive after radical trachelectomy routinely undergo pelvic ultrasound, and the cerclage is placed when the patient is pregnant. A Foley catheter (8 French) was in-

roduced vaginally and placed into the uterus. This was done to decrease the potential for scarring of the residual cervix. This was left in place for 9 d and then removed.

The operative time was 340 min. The estimated blood loss was 100mL. There were no intraoperative or postoperative complications. Bowel activity was re-established on the second postoperative day, and the patient was discharged home on that same day. The Foley catheter was removed on postoperative day 9. The patient has been voiding spontaneously since that time.

The final pathology revealed adenocarcinoma in situ in the specimen with no evidence of residual invasive disease. There were 10 pelvic lymph nodes removed and all were negative for malignancy. At 20 mo of follow-up, the patient is without evidence of disease. She is having regular menses, but has not yet attempted pregnancy.

DISCUSSION

There is broad experience with vaginal radical trachelectomy,⁹⁻¹¹ and more recently there is an increasing number of reports of abdominal radical trachelectomy.¹²⁻¹⁴ Minimally invasive surgery is becoming increasingly more popular in gynecologic oncology, not only for the basic procedures, but also for the more advanced surgeries.

To date, 44 cases of laparoscopic abdominal radical trachelectomy had been reported in 7 articles in the literature, including the present report (**Table 1**). Lee et al.³ publish 2 cases in 2003. In those patients, the operative times were 365 min and 340 min, respectively (including time for frozen sections), and the vaginal procedures took 65 min and 58 min, respectively. No major intraoperative complications occurred. Blood loss reported was 900mL for the first patient and 400mL for the second. Hospital stay was 18 and 7 d, respectively. Pelvic lymph node count was 20 for the first patient and 50 for the second patient, both of them without tumor involvement. Both women were doing well with regular menstruation and no evidence of recurrence at 12 mo and 9 mo, respectively.³

Cibula et al.⁴ reported one case of laparoscopic abdominal radical trachelectomy. The operative time was 250 min, and the estimated blood loss was 250mL. No intraoperative or postoperative complications occurred. Bowel activity was re-established on the second postoperative day, and the Foley catheter was removed on day 7. The hospital stay was 6 d. The pathologic specimens revealed 26 lymphatic negative nodes, negative vaginal cuff of 25mm, negative parametria of 43mm and 38mm, cervix without residual invasive cancer and CIN III in endocervical canal

Table 1.
Comparison of Series of Laparoscopic Abdominal Radical Trachelectomy

Characteristic	Lee et al ³	Cibula et al ⁴	Bafghi et al ⁶	Cibula et al ⁵	Park et al ⁷	Kim et al ⁸	Rendón et al (present case)
Number of patients	2	1	6	3	4	27	1
Age, years							
Mean	32	36	30	NA	29.5	29	31
Range	30–34		21–38		25–33	22–37	
Stage,							
IA2	0	0	2	NA	1	0	0
IB1	2	1	4		3	26	1
IB2	0	0	0		0	0	0
IIA	0	0	0		0	1	0
Histologic subtype,							
Squamous cell carcinoma	1	1	5	NA	4	20	0
Adenocarcinoma	0	0	0		0	6	1
Other	0	0	1		0	1	0
LVSI, number of patients	1	NA	NA	NA	NA	0	0
Number of lymph nodes							
Mean	35	26	18		NA	25.7	10
Range	20–50		11–34			8–50	
Median				24			
Estimated blood loss, mL							
Mean	650	250	NA		185	332	100
Range	400–900				60–280	50–1000	
Median				400			
Operative time, min							
Mean	352.5	250	201		250	290	340
Range	340–365		180–240		238–263	120–520	
Median				210			
Hospital stay, days							
Mean	12.5	6	4.5		6	9	2
Range	7–18		4–5		4–7	4–18	
Median				3			
Follow-up, months							
Mean	10.5	4	38		34	31	18
Range	9–12		19–55		27–37	1–58	
Median				21			
Ligation of uterine arteries	2	1	2	NA	NA	NA	1
Transfusions	NA	0	NA	NA	0	6	0
Pregnancies	NA	0	2	NA	0	3	0
Miscarriages	NA	0	1	NA	0	2	0
Deliveries	NA	0	1	NA	0	1	0
Recurrence	0	0	1	NA	1	1	0

with clear margins. Follow-up was 4 mo. The same group subsequently published a report of 3 additional cases using this technique.⁵ The median operative time was 210 min (range, 200 to 250), the median blood loss was 400mL (range, 350 to 700), the median number of pelvic nodes was 24 (range, 22 to 29), and the hospital stay was 3 d for all the cases. There were no recurrences reported during the follow-up time.

Bafghi et al.⁶ in 2006 reported 6 cases of laparoscopic radical trachelectomy. The median operative time was 201 min (range, 180 to 240), and the median number of pelvic nodes was 18 (range, 11 to 34). In this series, the uterine arteries were preserved in 4 cases. No intraoperative or postoperative complications were described. The hospital stay was 4 to 5 d for all the cases. One patient received adjuvant chemoradiation and brachytherapy for extensive lymph-vascular space involvement. She developed a recurrence 15 mo after surgery and subsequently died of disseminated disease. Two patients were able to achieve pregnancy. One had a spontaneous miscarriage at 7 wk, and the other patient underwent Caesarean delivery at 35 wk of gestation, and delivered a healthy infant.⁶

Park et al.⁷ in 2009 described 4 patients with early cervical cancer (1 with stage IA2, 3 with stage IB1) who underwent laparoscopic radical trachelectomy. The mean operative time and blood loss was 250 min and 185mL, respectively.

The pathologic diagnosis was squamous cell carcinoma for all cases. There were no nodal metastases. The mean follow-up period was 34 mo. Only one patient received concurrent chemo-radiation due to recurrence, followed by no further sign of progression.⁷

The largest series reported to date is by Kim and colleagues.⁸ In that series, a total of 27 patients underwent the procedure. The mean operating time was 290 min (range, 120 to 520). The mean estimated blood loss was 332mL (range, 50 to 1000). Perioperative transfusion was required in 6 patients (22.2%), and the mean transfusion volume was 2.2 U (range, 2 to 3). There were no intraoperative or postoperative complications. The mean postoperative hospital stay was 9 d (range, 4 to 18). The median follow-up time was 31 mo (range, 1 to 58). Of the 27 patients who completed laparoscopic radical trachelectomy, only one received adjuvant therapy with paclitaxel and cisplatin. One patient experienced a recurrence 8 mo after surgery and died of disease 4 mo later. A total of 6 patients attempted to conceive, and 3 were able to get pregnant. Of these, 2 patients suffered a miscarriage in the first trimester, and the third patient underwent a Caesarean delivery at 36 wk of gestation.⁸

In considering other modalities of minimally invasive surgery, a series of articles has reported a small number of patients undergoing radical trachelectomy by the robotics

Table 2.
Comparison of Series of Robotic or Robotic-Assisted Radical Trachelectomies

	Geisler et al ¹⁵	Persson et al ^{16,a}	Chuang et al ¹⁷	Burnett et al ¹⁸	Ramirez et al ¹⁹	Hong et al ²⁰
Number of patients	1	2	1	6	4	3
Operating time, min	172	373 ^b	345	360	282 ^b	275
Estimated blood loss, mL	100	125	200	108	62	23
Residual disease in trachelectomy specimen	No	No	No	1 ^c	No	No
Node count	26	26.5	43	NA	20	NA
Hospital stay, days	NA	3.5	2	1	1.5	5
Complications	None	Edema ^d	None	Herniation ^f and hemorrhage ^g	Neuropathy ^e	None

a. All data calculated as the average of the data for the 2 patients.

b. Console time only.

c. Endocervical margin revealed invasive adenocarcinoma, and complete hysterectomy was performed.

d. Lower extremity edema.

e. Resolved by postoperative day 20.

f. Herniation through a lateral 8-mm port site.

g. Hemorrhage from the inferior epigastric vessels, which resolved without intervention, but the patient required a blood transfusion of 2 units.

approach.^{15–20} These series are outlined on **Table 2**. Overall, the outcomes appear to be very similar when comparing a laparoscopic and a robotics approach; however, it is too early to determine which is the best minimally invasive modality to perform this surgery.

CONCLUSION

This is the first report of laparoscopic abdominal radical trachelectomy with pelvic lymphadenectomy performed in a developing country. We encourage others to continue publishing their experience to demonstrate the potential role of laparoscopic surgery when performing this important procedure, particularly in the developing world.

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