

Neoadjuvant Chemotherapy Followed by Simultaneous Robotic Radical Trachelectomy and Reversal of Tubal Sterilization in Stage IB2 Cervical Cancer

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ABSTRACT

Introduction: The aim of this study was to report a case of cervical cancer stage IB2 treated with neoadjuvant chemotherapy, followed by simultaneous robotic-assisted radical trachelectomy and reversal of tubal sterilization.

Case Description: This case occurred in a university hospital involving a 31-y-old woman with stage IB2 cervical cancer treated using neoadjuvant chemotherapy, robotic surgery, and tubal anastomosis to determine cancer disease status and achieve restoration of tubal patency.

Discussion: A successful radical trachelectomy with patent tubes was done bilaterally. Cancer and fertility procedures can be simultaneously implemented and achieved.

Key Words: Robotic-assisted radical trachelectomy, Neoadjuvant chemotherapy, Tubal anastomosis.

INTRODUCTION

Fertility-preserving treatments for females with reproductive tract malignancies are becoming a popular option in light of patients' preferences. We present a woman diagnosed with stage IB2 cervical cancer with a history of tubal sterilization. She received neoadjuvant chemotherapy followed by robotic-assisted radical trachelectomy and simultaneous tubal anastomosis.

CASE REPORT

The patient was a 31-y-old P2-0-0-2 with a history of 2 cesarean deliveries. During the last cesarean birth, she had tubal sterilization. She presented with vaginal bleeding and discharge for 2 y but did not seek medical advice because of lack of insurance and limited access to clinical care. She eventually went to a gynecologist, who did a Papanicolaou test revealing a squamous intraepithelial lesion. A loop electrosurgical excision procedure was done at the referring hospital showing invasive poorly differentiated squamous cell carcinoma (**Figure 1**). She was referred to gynecological oncology. On examination, she had a firm exophytic cervical mass 4 cm×6 cm with no parametrial or vaginal involvement. Results from a magnetic resonance imaging scan and computed tomography/positron emission tomography scan were consistent with the clinical findings, confirming mass size, absence of pelvic sidewall invasion, and suspicious bilateral pelvic lymph nodes (**Figure 2**). She was diagnosed as having stage IB2 cervical cancer with presumed inflammatory nodes. Her body mass index was 26.1. She had a 10-y smoking history but quit 3 y earlier. There was no history of sexually transmitted diseases. There is a family history of postmenopausal breast cancer in the mother, maternal grandmother, maternal great aunt, and maternal cousin.

The patient requested to preserve her fertility because she was planning to remarry. The treatment plan was to proceed with neoadjuvant chemotherapy, followed by radical robotic trachelectomy and tubal anastomosis. She received 4 cycles of neoadjuvant chemotherapy, Taxol 135 mg/m² over 24 h on day 1, and cisplatin 50 mg/m² on day

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2. She tolerated the neoadjuvant chemotherapy well with a complete clinical and imaging response. She then underwent robotic-assisted radical trachelectomy, bilateral pelvic, and periaortic lymph node dissection, and simultaneous tubal anastomosis. Six intraoperative frozen sections of nodes and margins revealed no malignancy.

We used a “two-suture” tubal anastomosis technique (**Figure 3**). Briefly, the tips of the proximal and distal ends were resected. A single stitch of a 6-0 Monocryl suture was used to reapproximate the mesosalpinx. The serosal, mucosal, and muscular layers of the tubal segments were sutured with another single 6-0 Monocryl suture through the lumen. Additional sutures were placed in the serosa at the 3 and 9 o'clock positions to better align the anastomosis. She received 2U of packed red blood cells because her preoperative hemoglobin (Hb) was 6.9 mg/dL and intraoperative estimated blood loss was 600 mL. There were no intraoper-

ative complications. The postoperative period passed smoothly, with the Foley catheter removed on the third postoperative day. She was unable to void spontaneously until then. The patient was discharged from the hospital on the fourth postoperative day. The histopathologic examination of the specimen revealed no evidence of residual invasive squamous cell carcinoma and negative lymph nodes. Postoperative Hb was 9.5 g/dL.

She was scheduled for a hysterosalpingogram 6 mo after her surgery, which revealed bilateral patent tubes (**Figure 4**). The patient remains disease free for more than 16 mo from completion of her chemotherapy.

DISCUSSION

In the United States, between 2004 and 2008, approximately 40.1% of newly diagnosed cervical cancers were in

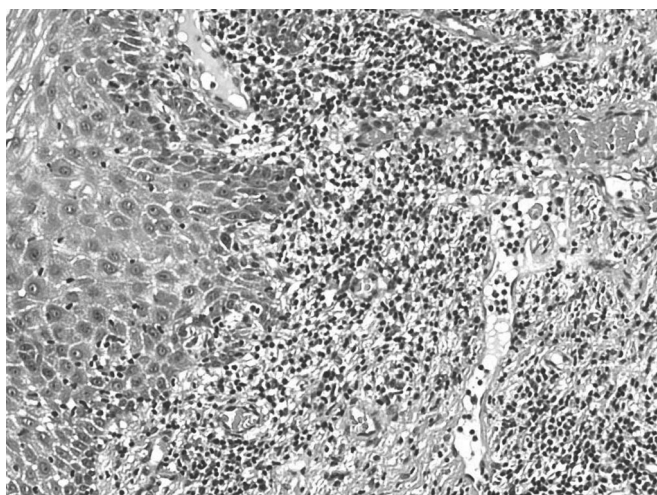


Figure 1. Microscopic appearance of the lesion.

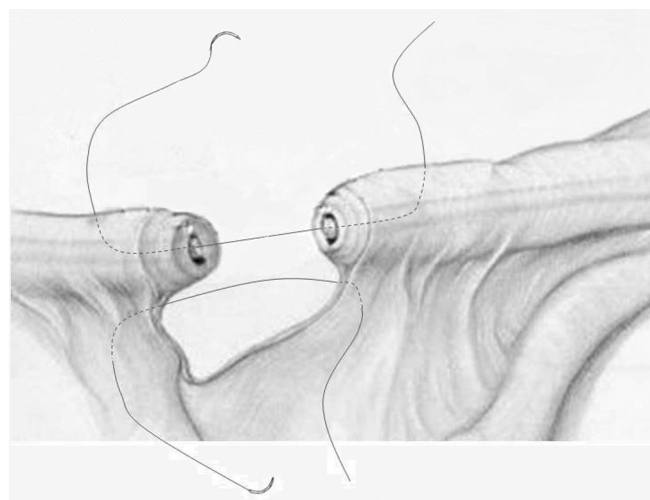


Figure 3. Two suture tubal anastomosis technique.

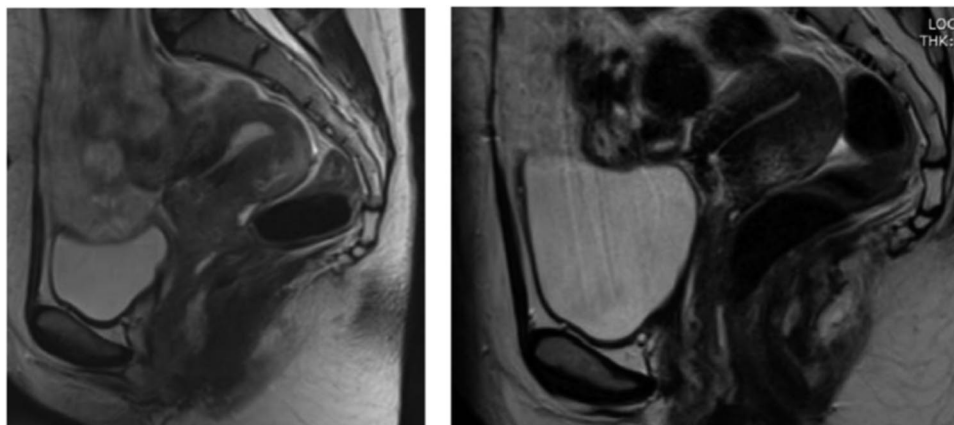


Figure 2. MRI before (left) and after (right) neoadjuvant chemotherapy showing near complete resolution of the lesion.

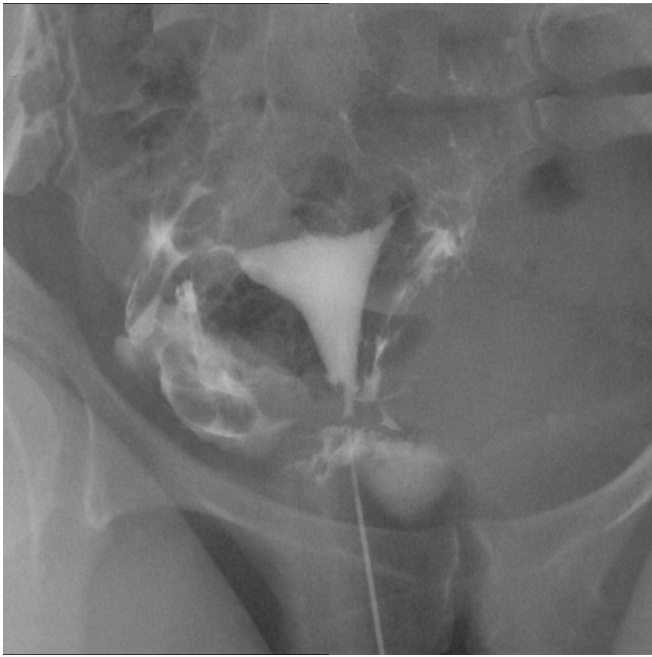


Figure 4. HSG 6 mo after the procedure showing patent tubes.

females <45 y of age.¹ This, together with the trend of delaying childbearing, results in more women diagnosed with cervical cancer interested in preserving fertility. Fertility-preserving options for female cancer patients have been an interesting area of research in the past few years, with increasing options being described. Currently, several fertility-preserving modalities are being described and commonly practiced today, depending on staging and histopathology.²

One of the available options is radical trachelectomy. It involves the removal of the cervix and parametrium with pelvic lymph nodes dissection. Many studies have found it to be a safe, feasible alternative approach to radical hysterectomy in properly selected early-stage patients seeking fertility preservation, with equal disease-free and overall survival rates.^{3,4}

The early report by Dargent et al.⁵ in 1994 described a vaginal approach with laparoscopic pelvic lymphadenectomy. The abdominal approach for trachelectomy was introduced in 1997, helping to overcome technical difficulties in the vaginal approach, especially in nulliparous women who comprise most candidates.⁶ The radical abdominal trachelectomy has some disadvantages, including longer hospital stay, more blood loss and pain, and, most important, it may contribute to pelvic adhesions, which may itself compromise future fertility, thereby affecting the main aim of this procedure.⁷ On the other hand,

radical abdominal hysterectomy has been associated with a larger parametrial specimen than vaginal trachelectomy.⁸

Some series reported higher recurrence rates with vaginal trachelectomy in tumors >2 cm,^{4,9} but none of them used neoadjuvant chemotherapy. In addition, series of abdominal trachelectomies show no increased risk of recurrence with tumors >2 cm.¹⁰ The use of neoadjuvant chemotherapy in patients with cervical cancer showed promising results, including better survival, and may extend the spectrum of patients who can undergo radical trachelectomy up to a tumor size of 5 cm.^{11,12}

The introduction of the da Vinci robotic system (Intuitive Surgical Corporation, Sunnyvale, CA) in the past few years has led to the development of robotic-assisted radical trachelectomy. The advantages of the robot system (i.e., high-definition 3-dimensional view and wristed instrumentation) all combined allowed us to consider a complex, multistep operation. In this patient, tubal anastomosis would not have been available, except as a part of her cancer care. Tubal surgery was not a covered benefit.

There are few reports on robotic radical trachelectomy in the literature.^{13–18} In 2008, Persson et al.¹³ were the first to report on it with 2 cases in nulliparous women with stage IB1 lesions, followed by a few other case reports and series, for a total of 17 cases to date.

Neoadjuvant chemotherapy represents an alternative to surgery and irradiation as initial treatment of locally advanced cervical cancer. There are several potential benefits of its use: It can eradicate micrometastases and “debulk” the tumor, thereby rendering inoperable tumors operable. This “downstaging” of the disease without the use of irradiation in younger patients is especially advantageous in avoiding damaging radiation to the ovaries, vagina, and uterine fundus. Radical surgical treatment after neoadjuvant chemotherapy for locally advanced cervical cancer has become an acceptable approach for locally advanced cancers, especially for younger patients.¹²

The first report on the use of robotic surgery in tubal anastomosis was in 1999.¹⁹ It was a pilot study in 10 patients. The procedure was successfully completed in all patients without complications, and the mean operative time to complete bilateral anastomosis was 159 ± 33.8 min. Our combined procedures are consistent with the time and blood loss described in these reports.

Many patients with limited healthcare access only receive care when confronted with life-threatening diseases, such as cancer, through various programs of assistance. This

brief period of access to healthcare may be the only hope some patients have for infertility treatment. In these unique situations, novel and individualized solutions must be considered. Similarly, no standard recommendations currently exist regarding the appropriate waiting period before trying to conceive after radical trachelectomy. It should be a personal decision that incorporates the patient's values as well as individual disease characteristics.²⁰

CONCLUSION

This case report is an early description of neoadjuvant chemotherapy, followed by robotic radical trachelectomy with simultaneous tubal anastomosis. Candidates for neoadjuvant chemotherapy followed by radical robotic-assisted trachelectomy may also present with tubal disease. A staged approach with 2 separate operations is reasonable, but unrealistic, for many limited resource patients. Our report indicates this alternative may be an option for some of these patients.

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