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First experience of the Egyptian National Cancer Institute using the robot-assisted laparoscopic approach in radical hysterectomies for cervical cancer



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ABSTRACT

Aim of work: Robotics in surgery led to an improvement of visualization, a better handling of tissues and better suturing. This study aimed to document the first experience of the Egyptian National Cancer Institute (NCI) using the robot-assisted laparoscopic approach in radical hysterectomies for cervical cancer and to highlight observed advantages, disadvantages, morbidity and oncological outcomes.

Patients and methods: Data of cases that had either early cervical cancer (stage IB-IIA1 with a tumor ≥ 2 cm) or locally advanced cervical cancer (Stage IIA2-IIIB after chemo-radiotherapy) were collected prospectively. Study patients underwent robotic radical hysterectomies for their cervical cancers at the NCI, Cairo University, between January 1, 2015 and December 31, 2016. For each patient, duration of surgery, amount of blood loss, and intra-operative complications were recorded. Similarly, the duration of post-operative hospital-stay, analgesia used and post-operative gastrointestinal recovery were documented. Pathological assessment of safety margins and the lymph nodes number yield were also assessed.

Results: Twenty patients underwent robotic radical hysterectomy during the study period. Twelve cases had early cervical cancer while 8 suffered locally advanced disease. The mean procedure time was 319 (range 240–560) minutes; the mean blood loss was 309 (range 150–600) ml. Three cases had bladder injuries during their procedures. The median hospital stay was 6 (range 4–10) days. One case had a positive margin. The median of lymph nodes yield number was 15 (range 10–25). Follow-up ranged 9–31 months, with only one case developing local recurrence.

Conclusion: Robotic radical hysterectomy is a feasible approach with a tolerable rate of complications.

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Introduction

It was estimated that 12,820 women would be afflicted with cervical cancer, with approximately 4210 resultant deaths in USA in 2017 [1]. In Egypt, however, cervical cancer occurs at a lower rate. It represented the tenth most common cancer in Egypt in 2012, with 866 new cases and 373 recorded deaths [2].

Surgical treatment still represents the cornerstone of treatment of early cases of cervical cancer (Stages I-IIa) [3]. After the original operation had been developed by Wertheim in 1898, many changes occurred in technique and different alternative

approaches developed [4]. In the past twenty years, there has been an increasing trend towards the use of minimally invasive procedures in gynecological diseases, especially in oncological operations. The aim has been to decrease morbidity associated with such surgeries while maintaining the best oncological results. Many studies have discussed the feasibility and oncological outcomes of the conventional laparoscopic approach in radical hysterectomy and showed that the results were comparable to the open technique with less resultant morbidity [5]. In spite of this, conventional laparoscopic radical hysterectomy has not become widely used because of many difficulties which face surgeons with regards to this technique, including the limited 2-D view; ergonomic problems due to the length of the operation; and a prolonged learning curve required to master the instruments used. A robot-assisted technique, using the DaVinci System, has been developed to address these difficulties. It provides a 3-D view,

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better magnification, better ergonomic and *endo*-wrist instruments which copy the surgeon's hand movements, making operations a lot easier [6,7]. This study aimed to present the first experience of the Egyptian National Cancer Institute (NCI) using the robot-assisted laparoscopic approach in radical hysterectomies for cervical cancer and to highlight observed advantages, disadvantages, morbidity and oncological outcomes.

Patients and methods

This case series involved patients with early stage (IB–IIA1) or locally advanced (IIA2–IIB after chemo-radiotherapy) cervical cancer presented to the Gynecological Surgical Oncology Clinic, the National Cancer Institute (NCI), Cairo University between January 1, 2015 and December 31, 2016. Only lesions ≥ 2 cm were included in the study. All patients underwent robotic radical hysterectomy. Patients who suffered from ischemic heart disease, heart failure or chronic obstructive pulmonary disease were excluded.

For each patient, the duration of the operation, amount of blood loss, any intraoperative complications, any conversion to open surgery and its causes, and any difficulties during the procedure were diligently recorded. In addition, the duration of hospital stay, types and doses of analgesia administered and the duration needed for gastrointestinal tract recovery were documented.

Histopathological examination of hysterectomy specimens were done, with a thorough assessment of margins. Excised lymph nodes were counted to assess the degree of success of the performed resection.

Preoperative therapy

A total of eight patients (40%) suffered locally advanced disease (stage IIA2, IIB) with a median tumor size of 5 cm (range: 4–10 cm). They received concomitant chemotherapy and radiotherapy. Chemotherapy was comprised of weekly Cisplatin in a dose of 40 mg/m². Radiotherapy was in the form of the external beam radiotherapy with a total dose of 50 GY. These cases did not receive brachytherapy. Four cases had complete response while the other 4 cases had partial response (tumor sizes for these four cases regressed and became 2, 3, 4 and 8 cm). Surgical procedures were done 6–8 weeks after finishing of chemo-radiotherapy.

Surgical treatment

Prophylactic anticoagulant treatment in the form of subcutaneous enoxaparin at a dose of 40 mg was administered 12 h preoperatively. One gram of ceftriaxone was also administered during induction of anesthesia. All operations were conducted using the Da Vinci Si Robot under general anesthesia. Covidien ForceTriad™ Energy Platform was used in all cases with monopolar and bipolar current adjusted on 40–50 W and 50–60 W respectively.

Patients were placed in the modified lithotomy position with thighs abducted and placed parallel to the ground. If possible, a RUMI II manipulator was inserted. After insufflation of the abdomen, trocars were placed in needed positions. The camera trocar was put 20 cm above symphysis pubis; the first working trocar was put 8 cm below and to the right of the camera port; the second trocar was placed 8 cm below and to the left of the camera port, and the third working trocar was put in the left iliac fossa. An assistant port was inserted in the right hypochondrial region (Fig. 1). Following that, the patient was placed in the Trendelenburg position.

The next step was a left side docking of robotic machine. A robotic monopolar hook or curved scissor was attached to the first

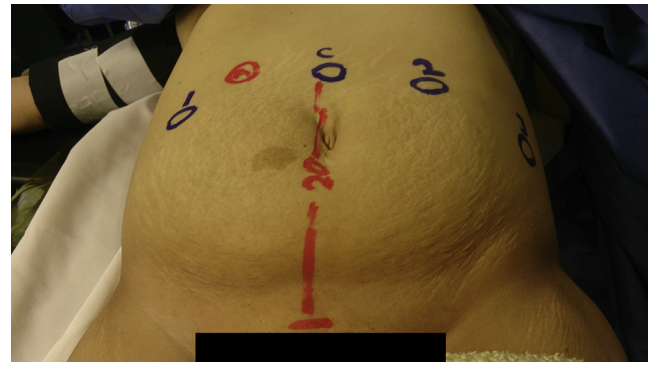


Fig. 1. Ports placement for robotic radical hysterectomy. C: Camera port, 1: first working port, 2: 2nd working port, 3: 3rd working port, a: Assistant port.

robotic arm; a fenestrated bipolar grasper attached to the second arm and prograsper to the third. Following this, a radical hysterectomy type C (QuerleueMorrow classification) with bilateral pelvic lymphadenectomy was performed for all cases, using the following steps:

- 1- The left round ligament was dissected and cut with a monopolar scissor or hook.
- 2- The broad ligament was opened using a monopolar scissor or hook. Both the paravesical and pararectal spaces were opened using a combined blunt and sharp dissection (Fig. 2a).
- 3- The ureter was identified (Fig. 2b), and then the infundibulopelvic ligament was separated and ligated using LigaSure™ (Fig. 2c and d).
- 4- The obturator space was opened and the obturator internus, obturator nerve and vessels were identified (Fig. 3a).
- 5- The uterine vessels were clipped and divided at their origin (Fig. 3b and c). The ureter was dissected from the uterine vessels.
- 6- The parametrium was dissected from iliac vessels.
- 7- The same steps from (1–6) were done on the right side.
- 8- The bladder was dissected from the cervix (Fig. 4a).
- 9- Then opening the recto-vaginal space was done by combined sharp and blunt dissection (Fig. 4b).
- 10- The cardinal ligaments were divided, and then an incision was made in the vagina along the ring of the manipulator. The uterus was delivered through the vagina and then the vaginal cuff was packed with gauzes to avoid air leak.
- 11- A pelvic lymphadenectomy was then easily performed. It included the external iliac, hypogastric and obturator nodes (Fig. 4c).
- 12- After the removal of the specimen, closure of the vaginal cuff either robotically or vaginally was performed (Fig. 4d).
- 13- Hemostasis and irrigation of pelvic cavity by saline was conducted, and a 20F one-tube drain inserted.
- 14- Lastly, the DaVinci system was undocked and all trocars removed.

Statistical methods

Statistical analysis was conducted using the IBM® SPSS® Statistics version 22. Numerical data were expressed as mean or median, standard deviation and range as appropriate. Qualitative data were expressed as frequency and percentage.

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