



ORIGINAL ARTICLE

Robotic assisted laparoscopic radical cystectomy for bladder carcinoma: early experience and oncologic outcomes

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Summary *Aims:* Robot-assisted radical cystectomy (RARC) has been a popular mode of therapy in the treatment of bladder carcinoma for several years, and its usage in bladder carcinoma patients is on the rise. We evaluated the usefulness of this mode of therapy by studying the clinical outcomes following RARC for the treatment of bladder carcinoma.

Methods: From 2006 to 2011, a total of eight patients in our hospital who underwent RARC for bladder carcinomas were enrolled in this study. Clinical outcomes were measured by means of preoperative status, operative strategy and initial outcomes.

Results: Follow-up ranged from 4 to 22 months (mean 10.9 months). The mean operative time was 430.3 minutes, and the operative time decreased with the increasing experience of the surgeon and assistants. The mean estimated blood loss was 762.5 mL. The surgical approach was RARC and orthotopic ileal neobladder in five patients (62.5%), bilateral nephrectomy with RARC in two patients (25%), and RARC with ileal conduit alone in one patient (12.5%). Histological examination showed five instances of stage pT1 tumor, one pT2 tumor, and two instances of original tumor with extravesical disease (pT3b). One patient had lymph node involvement. Postoperative complications included urethral stricture in one case and vesicovaginal fistula in another. The mean hospital stay was 10.8 days (range 7–26 days). None of the patients had a positive surgical margin. There was no surgical mortality in this series.

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Conclusion: RARC is a challenging but safe and minimally-invasive method of treating bladder carcinoma.

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1. Introduction

The American Cancer Society has estimated that nearly 71,000 Americans were diagnosed as having bladder cancer in 2009.^{1–3} Radical cystectomy (RC) is the gold standard surgical procedure for cases with muscle invasion and in many high-risk superficial bladder cancer cases. Minimally-invasive approaches to RC have been gaining popularity and have the potential to address some of the drawbacks of conventional open RC. Laparoscopic and robot-assisted radical cystectomy (RARC) have been performed since 2005 in several institutions.^{4–6} RARC is an accepted option where RC is indicated. This is a learning curve-associated method that involves the acquisition of proficiency in robotic surgery. The number of cases suggested before a surgeon is considered proficient for RARC varies widely in the related literature.⁷ RARC provides functional and oncological results similar to those of its open counterpart, with the advantage of being minimally invasive.⁷

In previous reports, minimally-invasive surgery for bladder carcinoma, such as laparoscopic or robot-assisted techniques for RC have been mentioned as acceptable surgical techniques, and the perioperative results of RARC have been deemed acceptable. The potential benefits of RARC are that it is safe and quick, resulting in less blood loss, there is less postoperative discomfort, and patients have a shorter hospital stay than with open surgery, leading to an earlier resumption of normal activities.⁷ The surgical technique is still at an early period of evaluation, however, and there are currently no randomized trials comparing open RC to RARC or to other more conventional forms of therapy. The purpose of the present study was to evaluate our early experience with regard to RARC in bladder carcinoma patients in order to improve understanding of the feasibility of this procedure and to provide insight into inherent selection bias. Clinical, perioperative, and pathological outcomes are reported.

2. Patients and methods

The da Vinci Surgical System was installed in our hospital in September 2006. A total of eight cases of robotic RC were performed for advanced bladder cancer by a single surgeon at the Chang Gung Memorial Hospital-Linko between September 2006 and November 2011. Table 1 shows the clinical data collected prospectively.

2.1. Step 1: Patient position and port placement

The patients were placed in the Trendelenburg position with their legs abducted. A Foley catheter was inserted into the bladder and a pneumoperitoneum was created with a Veress

needle. The transperitoneal approach was used, with the placement of six ports (Fig. 1). A 12-mm port was placed on the upper part of the umbilicus for the scope. Two 8-mm ports for the instrument arms were placed approximately 8–10 cm from the camera port. Three additional ports (usually two 12-mm ports and one 5-mm port) were placed on both sides of the abdomen for retraction and suction purposes by the assistant as well as for the insertion of suture materials using the technique described by Manoharan et al.⁸ The robot was then moved into place.

2.2. Step 2: Ureteral and posterior dissection

The procedure also followed the technique described by Manoharan et al.⁸ The sigmoid colon was reflected and both ureters dissected all the way to the bladder. Hem-o-lok clips (Weck Closure Systems, Research Triangle Park, NC, USA) were applied to the distal ureter. The ureteral margin was sent for frozen section to rule out cancer invasion. In men, the peritoneum over the rectovesical pouch was incised, and the rectovesical space was dissected to the apex of the prostate. In women, the Pouch of Douglas was incised at the junction between the uterus and the posterior vaginal wall. A hysterectomy and salpingo-oophorectomy was performed in all of the women. We modified this procedure and used the longitudinal incision for extirpation of the bladder tumor.

Table 1 Patient demographics.

Number of patients	8
Mean age in years (range)	58.1 (42–79)
Sex	
Male	5
Female	3
Body mass index in kg/m ² (range)	26.3 (21.3–40.5)
American Society of Anesthesiologists score	
1	5
2	3
Clinical stage	
T1	5
T2	1
T3	2
T4	0
Diversion type	
Neobladder	5
Ileal conduit	1
RARC with bilateral nephroureterectomy	2
Mean follow-up (months)	10.9

RARC = robot-assisted radical cystectomy.

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