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## Laparoscopic Radical Cystectomy and Urinary Diversion: Status in 2006

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### Abstract

**Objectives:** To discuss the perioperative outcomes and oncologic data of laparoscopic radical cystectomy (LRC) and urinary diversion in the treatment of invasive or high-risk superficial bladder cancer.

**Methods:** The authors describe their established technique, report their personal experience, review the current worldwide experience, and discuss perspectives concerning LRC and urinary diversion for bladder cancer.

**Results:** Data reviewed suggest that the laparoscopic approach to radical cystectomy contributes to less blood loss, decreased postoperative pain, and somewhat quicker recovery. Complication rates appear similar to the open approach. Extracorporeal performance of the bowel work and ureteroileal anastomoses have resulted in decreased operative times. A median of 21 lymph nodes were retrieved after laparoscopic extended pelvic lymphadenectomy. In 37 patients, estimated 5-yr overall and cancer-specific survival rates were 63% and 92%, respectively. No port-site metastases or local recurrences were noted.

**Conclusions:** LRC with extracorporeal urinary reconstruction is emerging as a viable alternative to open radical cystectomy while minimising patient morbidity. Intermediate oncologic outcomes are encouraging and comparable to those of open series.

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### 1. Introduction

Radical cystectomy with pelvic lymph node dissection is the reference standard for the treatment of invasive or high-risk superficial bladder cancer [1-4]. This advanced ablative and reconstructive procedure can be associated with considerable patient morbidity, especially due to the underlying pre-existing comorbidities of this population [4-6]. Com-

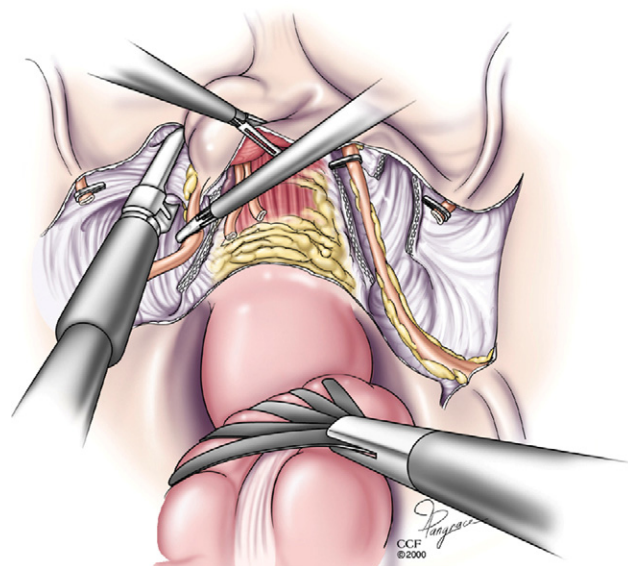
mensurate with increasing worldwide experience with laparoscopic pelvic surgery, particularly prostatectomy, urologists have explored the laparoscopic approach for radical cystectomy. Following the initial report of laparoscopic simple cystectomy for pyocystitis by Parra et al. in 1992 [7], the first laparoscopic radical cystectomy (LRC) was described by Sanchez et al. in 1995, in which an ileal conduit was fashioned extracorporeally after completion of

LRC [8]. Purely intracorporeal reconstruction of an ileal conduit and an orthotopic neobladder was not performed until 2000 and 2002, respectively, after successful pilot studies in animals performed at the Cleveland Clinic [9-12]. As global expertise and experience with laparoscopic surgery increases, interest in this procedure is also increasing to include a wide variety of reconstructive options. Herein, we describe our established technique, discuss the perioperative and oncologic outcomes of LRC, and review the current worldwide experience with this procedure.

## 2. Surgical techniques

### 2.1. LRC

Our technique of LRC aims to duplicate established oncologic principles underlying the open technique. With the patient in a modified dorsal lithotomy position a transperitoneal 5- or 6-port technique is used. The ureters are identified at the pelvic brim to begin with. They are circumferentially mobilised and traced down to the ureterovesical junction (UVJ). Both ureters are clipped and divided close to the bladder, and the distal ureteral margin is sent for frozen section. The proximal cut end of each ureter is temporarily clipped to facilitate hydrostatic distention. We apply two Hem-o-Lok<sup>®</sup> (Weck) clips on the distal cut end of the ureters to serve as a guide to the medial limit of the resection. The retrovesical space is now dissected. For this purpose it is essential to retract the sigmoid colon out of the pelvis to facilitate visualisation of the cul-de-sac. We use a 2-0 Prolene suture on a 2-inch long straight needle passed in through the skin in the left hypochondrium. The Prolene suture is passed through two appendices epiploicae of the most prominent part of the sigmoid colon and brought back out of the skin in the left hypochondrium and held taut with a hemostat. This effectively pulls the sigmoid colon out of the pelvis and provides an excellent view of the operative field. In men, a transverse peritoneotomy is made at the rectovesical pouch to identify the vas deferens and the seminal vesicles, which are divided, and maintained en bloc with the bladder specimen. Denonvilliers fascia is incised transversely and the posterior plane of dissection is developed along the prerectal fat towards the prostate apex. The lateral and posterior vascular pedicles of the bladder and the prostate are dissected and controlled with serial applications of an EndoGIA stapler (United States Surgical, Norwalk, CT; Fig. 1). Now an inverted U-shaped incision is made in the anterior parietal



**Fig. 1 – Controlling bladder pedicles. EndoGIA with vascular load is used to secure and transect left lateral pedicle.**

peritoneum. The urachus is detached from the umbilicus and the bladder is mobilised posteriorly, keeping all the extraperitoneal fat attached to the specimen. The retropubic space is developed, the endopelvic fascia is incised bilaterally, and the dorsal vein complex is controlled with an EndoGIA stapler. The urethra is divided sharply with cold Endoshears. The few remaining posteromedial and posterolateral attachments close to the apex are released and the specimen is immediately entrapped in an Endo-catch II bag (United States Surgical) for subsequent intact extraction.

In women, a sponge stick in the vagina or Koh colpotomiser system (Cooper Surgical, Trumbull, CT) allows the vaginal apex to be identified and incised. Appropriate technical modifications are made depending on the planned type of radical cystectomy and the specimen is retrieved either through the vagina or an infraumbilical 5-cm incision [13].

### 2.2. Pelvic lymph node dissection

Pelvic lymph node dissection is performed after the LRC. Right lymphadenectomy is carried out first. The lateral limit of the dissection is the genitofemoral nerve and the medial limit is the obturator nerve. The lymphatic tissue packet is dissected en bloc off the surface of the iliopsoas muscle and swept medially and cephalad (Fig. 2).

Initially the bifurcation of the common iliac arteries was our proximal limit of dissection. Since August 2002, we perform extended lymphadenectomy with the proximal limit at the aortic

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