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Laparoscopy

Long-Term Oncologic Outcome after Laparoscopic Radical Nephroureterectomy for Upper Tract Transitional Cell Carcinoma

Michael Muntener*, Matthew E. Nielsen, Frederico R. Romero, Edward M. Schaeffer, Mohamad E. Allaf, Fabio Augusto R. Brito, Christian P. Pavlovich, Louis R. Kavoussi¹, Thomas W. Jarrett²

The James Buchanan Brady Urological Institute, The Johns Hopkins Medical Institutions, Baltimore, MD, USA

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Abstract

Objective: To assess the long-term oncologic efficacy of laparoscopic radical nephroureterectomy (RNU).

Methods: Between August 1993 and May 2001, 39 patients underwent laparoscopic RNU for upper tract transitional cell carcinoma (TCC) at our institution. The medical records of these patients were retrospectively reviewed.

Results: Clinical outcomes were available in all 39 patients with an actual follow-up ranging from 60 to 148 mo (median: 74). During this time 27 patients (69%) developed at least one TCC recurrence. Eighteen patients had urothelial recurrences, and 9 patients had nonurothelial recurrences. Of these latter patients, 2 patients (5%) had local recurrences. No patient developed a port site metastasis. Eleven patients ultimately had disease progression and died from TCC 7–59 mo (median: 31) after the operation. On statistical analysis, tumor stage was the only factor significantly associated with death from the disease, and tumor location (ureter) was the only factor significantly associated with disease recurrence.

Conclusions: The long-term overall and disease-specific survival rates after laparoscopic RNU for upper tract TCC are well within the range of results reported after open surgery. Thus, the results of the present study support the continued development of laparoscopic techniques in the management of this aggressive disease.

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* Corresponding author. James Buchanan Brady Urological Institute, The Johns Hopkins Hospital, 600 N. Wolfe Street, Marburg 1, Baltimore, MD 21287-2101, USA. Tel. +1 410 955 5494; Fax: +1 410 955 0833. E-mail address: muntener@jhmi.edu (M. Muntener).

¹ Author's current address: The Department of Urology, North Shore-LIJ Health System, Long Island, NY, USA.

² Author's current address: Department of Urology, The George Washington University Medical Center, Washington, DC, USA.

1. Introduction

Transitional cell carcinoma (TCC) of the upper urinary tract is an aggressive disease with a propensity for recurrence, multifocality, and progression to advanced stage. These factors, coupled with the relative limitations of upper tract surveillance, have supported the development of radical nephroureterectomy (RNU) as the standard of care, especially for lesions of high grade or stage. Open RNU is a highly effective cancer treatment [1]; however, there is significant morbidity associated with the incision(s) necessary to gain adequate exposure. Laparoscopic RNU was first described in 1991 by Clayman et al [2], and since has become an alternative standard of care at many centers of excellence [3–5]. Results from a number of studies have shown significant advantages of laparoscopic RNU compared with open RNU in terms of blood loss, postoperative pain, and recovery time [4,6,7]. Equivalent short- and intermediate-term tumor control has also been demonstrated for the two approaches [4,6,8]. A principal limitation to the wider adoption of laparoscopic RNU, however, is the paucity of data on long-term oncologic efficacy. Thus, urologists worldwide are still less likely to choose a laparoscopic approach in the case of upper tract TCC than in cases involving other solid renal tumors [9]. The aim of this study was to assess the long-term outcome after laparoscopic RNU for upper tract TCC at our institution.

2. Patients and methods

After institutional review board approval was obtained, the medical records of all 39 patients who underwent laparoscopic RNU for upper tract TCC at our institution between August 1993 and May 2001 were retrospectively reviewed. Demographic, perioperative, pathologic, and clinical follow-up information was collected from the charts. Preoperative evidence of invasive tumor or high-grade tumor and tumor size of 2 cm or greater were considered indications for RNU. No patient received neoadjuvant chemotherapy.

All patients were operated by one of two surgeons (L.R.K., T.W.J.). Our technique of laparoscopic RNU as well as the preoperative workup have been reported in an earlier publication [3]. The nephrectomy and dissection of the proximal ureter were performed via a transperitoneal approach in all cases. No formal lymphadenectomy was performed. Either an open approach or a laparoscopic stapler resection was used to treat the distal ureter in the vast majority of the cases (Table 1). All pathology specimens were processed and evaluated by dedicated genitourinary pathologists. Tumor stage was determined according to the 1992 TNM classification [10]; tumor grade was determined according to the 1998 World Health Organization/International

Table 1 – Perioperative information (n = 39)

Median operating time (range)	312 min (191–715)
Median estimated blood loss (range)	300 ml (50–2000)
Intraoperative complications (%)	35 no (90)
	4 yes (10)
Open conversion (%)	35 no (90)
	4 yes (10)
Postoperative complications (%)	31 no (79)
	3 major, including
	1 mortality (8)
	5 minor (13)
Median length of hospital stay (range)	4 d (2–46)
Morcellation of the specimen (%)	4 cases (10)
Lapbag used to extract specimen (%)	21 no (54)
(Information unavailable in 2 cases)	16 yes (41)
Management of the distal ureter (%)	Laparoscopic stapler
(Information unavailable in 2 cases)	resection 13 (33)
	Open resection 19 (49)
	Other* 5 (13)
* See Results for details.	

Society of Urological Pathology consensus conference definitions [11]. Follow-up was not standardized over the entire study period but typically consisted of cystoscopy, urine cytology, and axial imaging (computed tomography or magnetic resonance imaging) every 3–12 mo and when clinically indicated. In patients not followed at our institution, information was collected from treating physicians or the patients themselves. Follow-up time was calculated from the date of surgery to the date of the most recent documented examination or patient contact. Overall disease recurrence was defined as the development of local recurrence, distant metastasis, or urothelial recurrence of TCC. When patients died, the cause of death was determined by the treating physicians, by chart review corroborated by death certificates, or by death certificates alone. Patients who died of causes other than TCC were censored at the date of last follow-up for TCC-specific survival analyses.

The Kaplan-Meier method was used to calculate survival functions, and differences were assessed with the log-rank statistic. The following variables were evaluated for association with the survival outcomes of disease recurrence and disease-specific mortality: patient age (older vs. younger than the mean age), sex (male vs. female), history of bladder TCC (yes vs. no), tumor stage (Tis, Ta, or T1 vs. T2–T4), tumor grade (low vs. high), tumor site (ureteral involvement vs. no ureteral involvement), tumor multifocality (yes vs. no), presence of carcinoma in situ (yes vs. no), resection of the distal ureter (laparoscopic vs. open), and use of a specimen retrieval bag (yes vs. no). Statistical significance in this study was set as $p < 0.05$. Statistical analysis was performed with the use of commercially available software.

3. Results

Perioperative information (Table 1) and demographic data (Table 2) were available in all 39 cases. The management of the distal ureter was transvesical or extravesical open excision with a bladder

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