ELSEVIER

Urologic Oncology: Seminars and Original Investigations 31 (2013) 1161–1165

UROLOGIC ONCOLOGY

Original article

Multifocality rather than tumor location is a prognostic factor in upper tract urothelial carcinoma

Andrew K. Williams, M.D.[a], Wassim Kassouf, M.D.[b], Joseph Chin, M.D.[a], Ricardo Rendon, M.D.[c], Niels Jacobsen, M.D.[d], Adrian Fairey, M.D.[d], Anil Kapoor, M.D.[e], Peter Black, M.D.[f], Louis Lacombe, M.D.[g], Simon Tanguay, M.D.[b], Alan So, M.D.[f], Jean-Baptiste Lattouf, M.D.[b], David Bell, M.D.[c], Yves Fradet, M.D.[g], Fred Saad, M.D.[h], Ed Matsumoto, M.D.[e], Darrel Drachenberg, M.D.[i], Ilias Cagiannos, M.D.[j], Jonathan I. Izawa, M.D.[a,*]

[a] *Division of Urology, Department of Surgery and Oncology, UWO, London, Ontario, Canada*
[b] *Department of Urology, McGill University, Montreal, Quebec, Canada*
[c] *Department of Urology, Dalhousie University, Halifax, Nova Scotia, Canada*
[d] *Division of Urology, University of Alberta, Edmonton, Alberta, Canada*
[e] *Division of Urology, McMaster University, Hamilton, Ontario, Canada*
[f] *Department of Urological Sciences, University of British Columbia, Vancouver, British Columbia, Canada*
[g] *Division of Urology, University of Laval, Quebec, Quebec, Canada*
[h] *Division of Urology, University of Montreal, Montreal, Quebec, Canada*
[i] *Division of Urology, University of Manitoba, Winnipeg, Manitoba, Canada*
[j] *Division of Urology, University of Ottawa, Ottawa, Ontario, Canada*

Received 30 August 2011; received in revised form 3 December 2011; accepted 4 December 2011

Abstract

Objectives: Whether a patient has urothelial carcinoma located within the renal pelvis or ureter remains a controversial prognostic indicator in clinical urology. We wished to evaluate whether tumor location is associated with recurrence in patients undergoing nephroureterectomy for upper tract urothelial cancer in a large volume patient cohort.

Subjects and methods: We created a retrospective database of patients from 7 academic centers throughout Canada who underwent nephroureterectomy for upper tract urothelial carcinoma. Patient demographics as well as pathologic and surgical factors were analyzed to evaluate any statistical association between tumor location and overall survival, disease-free survival, and disease-specific survival.

Results: A total of 1,029 patients had data available for analysis with a mean follow up of 3.2 years. Kaplan Meier 5-year disease-free survivals (DFS) were 46%, 37%, and 19% for renal pelvis tumors, ureteric tumors, and multifocal tumors respectively. There was no association between the location of the tumor and the DFS, however, disease involving both the ureter and renal pelvis was associated with lower DFS and overall survival (OS) ($P < 0.001$).

Conclusions: Tumor location does not appear to have any influence on the risk of recurrence of disease following nephroureterectomy in this large patient cohort. However, multifocal tumors involving both the ureter and renal pelvis had a significantly worse prognosis and should be considered for more aggressive management.

Keywords: Urothelial; Carcinoma; Nephro-ureterectomy; Renal pelvis; Ureter

1. Introduction

There is ongoing debate as to whether the location of transitional cell carcinoma has a significant impact on the prognosis in upper tract urothelial carcinoma (UTUC). Given the relatively infrequent occurrence of UTUC, good statistical analysis of risk factors is limited by the size of the

* Corresponding author. Tel.: +519-685-8451; fax: +519-685-8455.
E-mail address: Jonathan.izawa@lhsc.ca (J. Izawa).

1078-1439/$ – see front matter © 2013 Published by Elsevier Inc.
http://dx.doi.org/10.1016/j.urolonc.2011.12.004

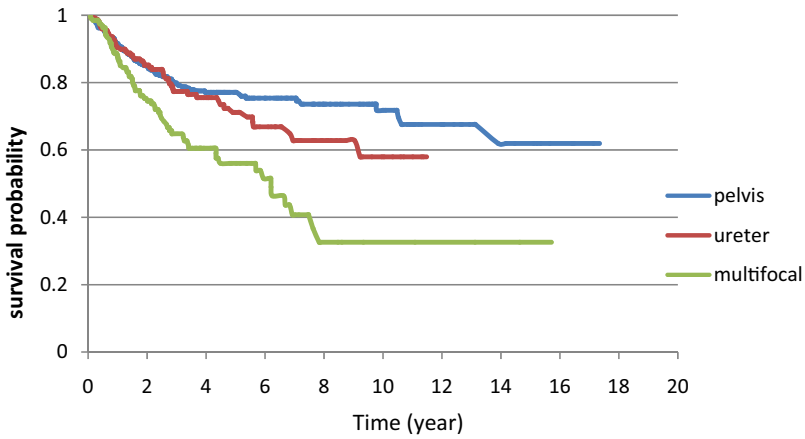

Fig. 1. Disease-specific survival following nephroureterectomy by tumor site. (Color version of figure is available online.)

patient cohorts in many studies. A study by Park et al. on 86 patients [1] showed that ureteric UC had a significantly worse prognosis than renal pelvis UC. This, however, was disputed in a study of 324 patients by Favaretto et al. [2], which showed no correlation between tumor location and survival. With the growing evidence that lymphadenectomy may have a therapeutic role in UTUC [3], the need to establish risk factors for patients who may benefit from more extensive surgery is increased. We wished to establish, using a multicenter analysis, whether there was any association between tumor location and survival.

2. Methods

A retrospective pooled multi-institutional database from 7 tertiary academic centers across Canada was created in which any patient undergoing nephroureterectomy for TCC from 1995 to 2010 was included. Data captured included patient demographics including age, gender, and race. Surgical details captured included whether an open or laparoscopic approach was performed and the presence or absence of lymphadenectomy. Pathologic data recorded, including tumor stage, grade, presence of lymphovascular invasion, architecture, presence of carcinoma in situ, nodal status, and location of the UTUC. Patients were followed up as per local protocol and any recurrence documented. We performed statistical analyses using SPSS software ver. 9.2 (SPSS Inc., Chicago, IL). Noncategorical variables were analyzed and compared using the Student's *t*-test, and categorical variables were analyzed and compared using the χ^2 test. We calculated cumulative survival rates according to the Kaplan-Meier method, and we performed univariate analyses using the log-rank test. Variables tested in univariate analysis included gender, age, race, open surgery, laparoscopic surgery, and lymph node dissection. Multivariate analyses involved forward conditional stepwise Cox regression analysis. Variables tested in multivariate analyses included age, location, open surgery, laparoscopic surgery, lymph node dissection, pathologic disease stage, and tumor grade.

3. Results

A total of 1,029 patients were recruited for this study with a mean follow-up of 3.2 years (SD 3.3). Mean age at the time of nephroureterectomy was 69.7 years; 64% of patients were male and 95% were Caucasian race. Kaplan-

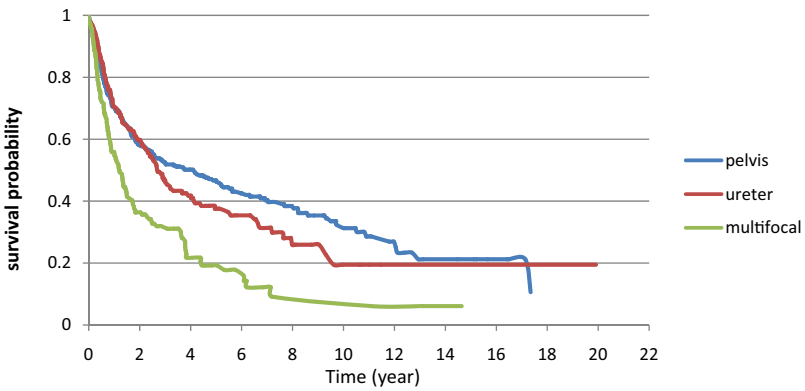

Fig. 2. Recurrence-free survival following nephroureterectomy by tumor site. (Color version of figure is available online.)