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ORIGINAL ARTICLE

Urothelial cancer of bladder in young versus older adults: Clinical and pathological characteristics and outcomes



Onur Telli ^{a,*}, Hasmet Sarici ^a, Berat Cem Ozgur ^a,
Omer Gokhan Doluoglu ^a, Mehmet Melih Sunay ^a, Selen Bozkurt ^b,
Muzaffer Eroglu ^a

^a Clinic of Urology, Ankara Training and Research Hospital, Ankara, Turkey

^b Department of Medical Sciences and Biostatistics, School of Medicine, Akdeniz University, Antalya, Turkey

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Abstract Bladder urothelial carcinoma is rare in young adults and occurs more commonly in older individuals. The aim of this study was to compare the clinical behavior, pathologic characteristics, and prognosis of urothelial carcinoma of urinary bladder in young versus older adults. A retrospective review of our records between 2007 and 2013 identified 56 patients (42 males and 14 females) with transitional cell carcinoma of the bladder who were less than 40 years old. Clinical and pathological parameters of patients who were less than 40 years of age were compared with those of a series of patients older than 40 years of age (the control group) during the same period. A survival analysis was performed using the Kaplan–Meier method and log-rank test, and Cox regression was performed to identify clinical parameters that affected the clinical outcomes. The mean age was 29.21 years (range, 5–40 years) for patients less than 40 years old and 61.66 years (range, 41–75) for those older than 40 years. The mean follow-up was 40.26 months (range, 12–65 months) for young patients and 42.57 months (range, 12–72 months) for the older patients. Young bladder cancer patients had smaller-sized tumors (less than 3 cm), less high-grade cancers, higher papillary urothelial neoplasms of low malignant potential, and low-grade tumors than patients older than 40 years. Multivariate logistic regression analysis predicted tumor recurrence in young patients with high-grade tumors [odds ratio (OR), 1.959; 95% confidence interval (CI), 1.235–2.965; $p = 0.046$] and tumors larger than 3 cm (OR, 1.772; 95% CI, 1.416–1.942; $p = 0.032$). The 5-year overall survival rate was 100% for young patients and 88.1% for older patients. No difference was observed in the recurrence-free ($p = 0.321$) and progression-free ($p = 0.422$) survival rates between the two groups. We concluded that although the

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* Corresponding author. Clinic of Urology, Ankara Training and Research Hospital, Ulucanlar Cadde, Number 89, Altindag, Ankara, Turkey.
E-mail address: onurtelli@yahoo.com (O. Telli).

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clinical stage distribution, natural history, and outcomes of bladder urothelial cancer in young adults are similar to those in their older counterparts, clinicians must be aware that patients under 40 years of age presented with higher-grade and larger (>3 cm) tumors and are more likely to experience tumor recurrence.

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Introduction

Transitional cell carcinoma (TCC) of the bladder is uncommon below the age of 40 years (1%) [1,2]. There is no univocity on clinical outcomes of such neoplasms. According to some authors, such tumors are noninvasive low-grade tumors with low recurrence rate and, therefore, an improved prognosis [3–6]. In contrast, some studies have observed similar patterns in younger and older patients [1,7–9]. In our study, we evaluated clinical behavior, pathological outcomes, and disease recurrence and survival in patients with bladder TCC who were younger than 40 years of age. We compared our data with a matched cohort of older patients (older than 40 years) with bladder TCC.

Materials and methods

We retrospectively reviewed our medical records between May 2007 and June 2013, and identified 56 patients (42 males and 14 females) with TCC of the bladder who were less than 40 years old. Demographic data, including patients' age, sex, presenting symptoms, initial transurethral pathology, tumor diameter and locations, stages and grades at initial transurethral resection, recurrence events and disease progression to different stages or grades, and disease status, were collected. We also reviewed and selected a series of patients older than 40 years of age by a case-matched analysis as the control (comparison) group, with a case/control rate of 1:2, during the same period. The 2004 World Health Organization (WHO) International Society of Urologic Pathology and 2002 tumor-stage classification were used to evaluate the stages and grades of bladder cancer [10–12]. Patients with nontransitional bladder cancer, a history of known bladder cancer, and upper tract urinary cancer were excluded from the study. Disease recurrence was defined as the reappearance of the disease at any site of the bladder and progression was defined as conversion in tumor-stage classification of cancer. Additionally, recurrence- or progression-free periods were defined between the dates of initial diagnosis of bladder cancer and those of disease recurrence or progression.

Statistical analysis

Patients younger than 40 years old were divided into two subgroups according to age presentation: younger than 30 years old and between 30 and 40 years old. Data between groups were analyzed using the Chi-square test.

Recurrence-free, progression-free, and overall survival analyses were performed using the Kaplan–Meier method and log-rank test. Multivariate Cox proportional hazards analysis was performed to identify independent predictors of the recurrence of TCC of the bladder in patients less than 40 years old. These predictors included sex, tumor stage, tumor grade, multifocality, and tumor size. All statistical analyses were performed using SPSS ver.16.5 (Statistical Package for Social Sciences for Windows 16.5; SPSS Inc., Chicago, IL, USA). A *p* value of <0.05 was considered statistically significant.

Results

Between May 2007 and June 2013, 56 patients (42 males and 14 females) with TCC of the bladder who were less than 40 years old were included in the young group and 112 patients with TCC of the bladder who were more than 40 years old were included in the control group. For the two groups, the mean age at diagnosis was 29.21 years (range, 5–40 years) and 61.66 years (range, 41–75), with a male-to-female ratio 3:1 and 3.3:1, respectively. The mean follow-up time was 40.26 months (range, 12–65 months) for young patients and 42.57 months (range, 12–72 months) for older patients. A total of 25 patients (44.6%) were under the age of 30 years, and 31 (55.3%) were between 31 and 40 years of age. Macroscopic hematuria was the presenting symptom in 41 patients (73.2%) in the young group and in 79 patients (70.5%) in the older group. The clinical characteristics of younger patients and their older counterparts are presented in Table 1. Bladder urothelial cancer tumors occurring in patients 40 years or younger were predominantly ≤ 3 cm in size and of low grade. As shown in Table 1, the young group had significantly higher papillary urothelial neoplasms of low malignant potential, low-grade tumors (percentage of papillary urothelial neoplasms of low malignant potential, 28% vs. 16%; low-grade tumors, 64% vs. 49%; *p* = 0.041), tumors of ≤ 3 cm diameter (89% vs. 61%; *p* < 0.001), and a lower recurrence rate (30% vs. 47%, *p* = 0.040). Multivariate logistic regression analysis predicted tumor recurrence in young patients with high-grade tumors [odds ratio (OR), 1.959; 95% confidence interval (CI), 1.235–2.965; *p* = 0.046] and tumors larger than 3 cm (OR, 1.772; 95% CI, 1.416–1.942; *p* = 0.032) (Table 2).

The Kaplan–Meier method was used to estimate the recurrence-free, progression-free, and overall survival rates. The 5-year overall survival rate was 100% for young patients and 88.1% for older patients. No difference was observed in the recurrence-free (*p* = 0.321) and progression-free (*p* = 0.422) survival rates between the two groups (Fig. 1).

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