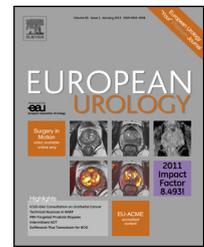


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## Platinum Priority – Urothelial Cancer

Editorial by J. Alfred Witjes on pp. 155–157 of this issue

# Comparative Outcomes of Primary, Recurrent, and Progressive High-risk Non-muscle-invasive Bladder Cancer

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### Article info

#### Article history:

Accepted August 28, 2012  
Published online ahead of  
print on September 5, 2012

#### Keywords:

Bladder cancer  
High-risk  
CIS  
Outcome  
Prognosis

### Abstract

**Background:** The treatment of high-risk non-muscle-invasive bladder cancer (BCa) is problematic given the variable natural history of the disease. Few reports have compared outcomes for primary high-risk tumours with those that develop following previous BCAs (relapses). The latter represent a self-selected cohort, having failed previous treatments.

**Objective:** To compare outcomes in patients with primary, progressive, and recurrent high-risk non-muscle-invasive BCa.

**Design, setting, and participants:** We identified all patients with primary and relapsing high-risk BCa tumours at our institution since 1994. Relapses were divided into progressive (previous low- or intermediate-risk disease) and recurrent (previous high-risk disease) cancers.

**Outcome measurements and statistical analysis:** Relationships with outcome analysed using multivariable Cox regression and log-rank analysis.

**Results and limitations:** We identified 699 primary, 110 progressive, and 494 recurrent high-risk BCa tumours in 809 patients (average follow-up: 59 mo [interquartile range: 6–190]). Muscle invasion occurred most commonly in recurrent (23%) tumours, when compared to progressive (20%) and primary (14.6%) cohorts (log rank  $p < 0.001$ ). Disease-specific mortality (DSM) occurred more frequently in patients with recurrent (25.5%) and progressive (24.6%) tumours compared to primary disease (19.2%; log rank  $p = 0.006$ ). Other-cause mortality was similar in all groups (log rank  $p = 0.57$ ), and overall mortality was highest in the progressive cohort (62%) compared with the recurrent (58%) and primary groups (54%; log rank  $p < 0.001$ ). In multivariable analysis, progression and DSM were predicted by tumour grouping (hazard ratio [HR]:  $>1.15$ ;  $p < 0.026$ ), stage (HR:  $>1.30$ ;  $p < 0.001$ ), and patient age and sex (HR:  $>1.03$ ;  $p < 0.037$ ). Carcinoma in situ was only predictive of outcome in primary tumors. Limitations include retrospective design and limited details regarding bacillus Camille-Guérin use.

**Conclusions:** Patients with relapsing, high-risk, BCa tumors have higher progression, DSM, and overall mortality rates than those with primary cancers. The use of bladder-sparing strategies in these patients should be approached cautiously. Carcinoma in situ has little predicative role in relapsing, high-risk, BCa tumors.

**Patient summary:** The behaviour of aggressive noninvasive bladder cancer varies considerably. In this paper, we compared outcomes from new and relapsing cancers, using a large series of patients from a single British hospital. We found relapsing tumours were more aggressive than similar new cancers and suggest this should be considered when deciding on treatment.

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