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Conditional Survival Probabilities Following Bladder Preservation for Patients With Muscle-Invasive Bladder Cancer

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Purpose/Objective(s): Trimodality treatment for patients with muscle-invasive bladder cancer (MIBC) has been shown to produce comparable outcomes to those of cystectomy with the benefit of organ preservation. Although overall and disease-specific survival rates following bladder preservation are well described, the relevance of such data diminishes over time for cancer survivors. Conditional survival (CS) statistics provide more relevant survival estimates for long-term survivors in follow-up. Although CS following radical cystectomy has been described, to our knowledge it has not been reported in the context of bladder preservation. The primary aim of this study was to analyze CS estimates for patients undergoing bladder preservation therapy. A secondary study objective was to determine if factors prognostic of survival at the time of diagnosis remain relevant in survivorship.

Materials/Methods: Patients diagnosed with nonmetastatic, MIBC between 1998 and 2011 were identified from the Surveillance, Epidemiology, and End Results Database. Data on patient and tumor characteristics, as well as initial treatment with surgery and radiation therapy (RT), were extracted. Overall survival (OS) and cause-specific survival (CSS) were calculated using the Kaplan-Meier method. Prognostic factors associated with survival at different time points from diagnosis were analyzed using multivariable Cox proportional hazards modeling (MVA).

Results: A total of 3488 patients with nonmetastatic MIBC who underwent transurethral resection of tumor (TURBT) followed by RT were identified. The median age at diagnosis was 79 years, and 86% of patients were White. The 1-, 3-, and 5-year OS estimates from the time of diagnosis were 62%, 31%, and 35%, respectively. The 1-, 3-, and 5-year CSS estimates from the time of diagnosis were 22%, 71%, and 41%, respectively. Given a 1-year (n = 2000), 3-year (n = 803), and 5-year (n = 432) survivorship, a patient's chance of surviving an additional 5 years increased by +8% (30%), + 22% (44%), and +24% (46%), respectively, whereas 5-year CSS increased by +12% (47%), +36% (71%), and +44% (79%). Prognostic factors associated with all-cause mortality at the time of diagnosis on MVA were increasing age, black race, and stage ($P < .05$). However, after 5 years of survivorship, increasing age was the only factor associated with survival on MVA (hazard ratio = 1.08, $P < .001$).

Conclusion: These data provide important information that can be used to counsel bladder preservation therapy patients on how their prognosis may change over time and may be incorporated into survivorship care plans. This information may also be used by clinicians to further inform management decisions regarding long-term follow-up and cystoscopic surveillance based on changing survival expectations over time.

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A Systematic Review of Radical Cystectomy Versus Organ Preserving Trimodal Therapy in Muscle-Invasive Bladder Cancer

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Purpose/Objective(s): To compare 5-year overall survival (OS) rates from retrospective and prospective studies of radical cystectomy (RC) ± neoadjuvant chemotherapy (NAC) and combined trimodal therapy (TMT), that is, concurrent delivery of chemotherapy and radiation therapy after a transurethral resection of bladder tumor (TURBT), in the management of nonmetastatic muscle-invasive bladder cancer (MIBC), respectively.

Materials/Methods: A PubMed literature search was conducted using the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) literature selection process. All prospective and retrospective studies available in full text from January 1990 to December 2013, involving more than 20 patients with nonmetastatic MIBC stage T2−4a N0 M0, treated with RC (± NAC) or TMT, and reporting 5-year overall survival (OS) rates, were selected.

Results: A total of 10,265 and 3,131 patients in the RC (± NAC) and TMT groups, respectively, were identified. The median 5-year OS was 52% in the former group and 57% in the latter group ($P = .04$), respectively. The median 5-year OS rates of patients who received RC alone or RC + NAC were 51% ($P = .02$) and 53% ($P = .38$), respectively. Multivariate analysis confirmed TMT as a significant prognostic variable.

Conclusion: Compared with RC (± NAC), TMT is associated with a survival advantage in the management of MIBC. The addition of NAC may improve the RC outcome in some subgroups of patients with a higher probability of micrometastases. Appropriate randomized controlled trials are warranted to confirm these findings and define the role of the organ preservation strategy in this setting.

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Development and Validation of Contouring Guidelines for Postcystectomy Adjuvant Radiation of Bladder Cancer

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Purpose/Objective(s): Several organizations are considering studying the role of adjuvant radiation for bladder cancer patients at elevated risk of locoregional failure (LF). However, the clinical target volumes (CTVs) and organs at risk (OARs) for this treatment have not been defined in detail. The purpose of this project was to define multi-institutional consensus CTVs and OARs for male and female bladder cancer patients undergoing adjuvant radiation in clinical trials.

Materials/Methods: We convened a multidisciplinary group of bladder cancer specialists representing 9 institutions in 3 countries. Five radiation oncologists and 7 urologists participated in the development of the proposed contours, and another 5 radiation oncologists participated in their validation. The development group proposed initial language for the CTVs and OARs and contoured according to these on CT scans of a male and female patient who had prior radical cystectomies. We required that initial contours for the CTVs have input from at least 1 urologist at each participating institution. Using the binomial maximum-likelihood estimates method, we generated 95% level initial development group contours. We evaluated the contours for level of agreement using the Landis and Koch interpretation of the K statistic. Based on the initial contouring, the development group updated its descriptions of the CTVs and OARs. To determine whether the updated language produces consistent contours, the cystectomy bed contour was redrawn on the male and female CT sets by an additional 5 radiation oncologists.