A Cost-effectiveness Analysis of Management of Low-risk Non–muscle-invasive Bladder Cancer Using Office-based Fulguration

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OBJECTIVE To examine the cost-effectiveness of endoscopic treatment of low-risk non–muscle-invasive bladder cancer (NMIBC) via office-based fulguration vs operating room–based transurethral resection of the bladder (TURB).

METHODS A Markov state-transition model was created to simulate and compare the economic burden of managing patients with office-based fulguration vs TURB. Direct procedural and hospitalization costs were queried from our institution. Patients were modeled as being followed up routinely with flexible cystoscopy, whereas tumor recurrences were treated with either fulguration or TURB.

RESULTS A strategy of office-based fulguration was more cost-effective than TURB ($1171 per quality-adjusted life year [QALY] vs $1208 per QALY) to treat recurrent NMIBC over a 5-year period. Fulguration was both more effective (14.94 vs 14.91 QALYs) as well as less expensive ($17,494 vs $18,005), thus dominating TURB. The incremental cost-effectiveness ratio was −$18,440 per QALY. Sensitivity analysis demonstrates that the relative costs of the procedures are more significant in determining cost-effectiveness than their respective utilities.

CONCLUSION Office-based cystoscopy and fulguration was more cost-effective than TURB for treating recurrent low-risk NMIBC. Adherence to an office-based treatment plan can lead to significant cost savings with a decreased therapeutic burden over the lifetime of a patient with NMIBC. UROLOGY 85: 381–387, 2015. © 2015 Published by Elsevier Inc.

More than 70,000 cases of bladder cancer are diagnosed every year.[1] At first presentation, 80% of these patients present with non–muscle-invasive bladder cancer (NMIBC).[2] These tumors however carry a high risk of recurrence, mandating regular surveillance. The need for repeated office visits and cystoscopic surveillance, as well as the treatment of recurrent lesions, often with intravesical therapy, can therefore be costly, making bladder cancer the most expensive malignancy to treat.[3] In fact, approximately 60% of the lifetime cost affiliated with bladder cancer is attributable to tumor surveillance.

Guidelines on the frequency of follow-up recommend cystoscopy at 3 months and then at increasing intervals as appropriate, resulting in significant heterogeneity in terms of surveillance schedules as well as significant burden of care.[4,5] In the hopes of decreasing this burden of care, we have previously described a surveillance scheme using office-based cystoscopy with fulgurations of recurrent low-risk NMIBC in lieu of operating room (OR)–based TURB. This would reduce the need for OR-based interventions, thus lowering the cost burden of disease, without compromising oncologic outcomes.[6,7]

In this study, we sought to quantify and analyze the cost-effectiveness of office-based vs OR-based management of low-risk papillary NMIBC.

METHODS

After institutional review board approval was obtained, a Markov state-transition model was constructed to simulate different management strategies for a hypothetical group of patients with low-risk papillary NMIBC, that is, low-grade Ta disease, after initial TURB (Fig. 1). In this model, patients exist in 1 of the 2 disease states, that is, disease free or disease recurrence. After the initial TURB, all patients are assumed to have been rendered disease free. Urinary biomarkers were not used owing to their insensitivity relative to cystoscopy in detecting low-grade

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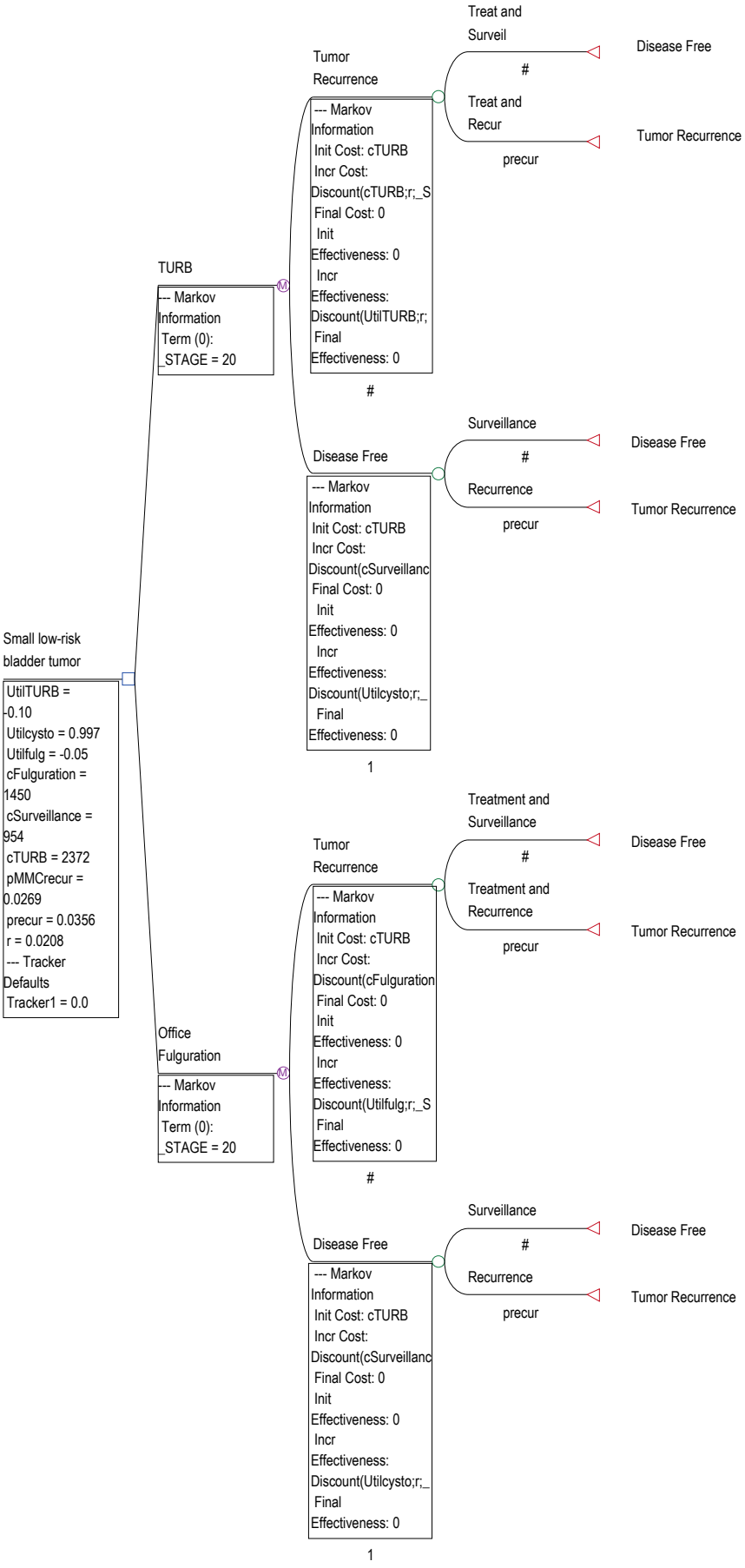

Figure 1. Schematic of Markov state-transition model. TURB, transurethral resection of the bladder. (Color version available online.)