CLINICAL OUTCOMES OF INTRAVESICAL CHEMOTHERAPY IN PATIENTS WITH HIGH-RISK NON-MUSCLE INVASIVE BLADDER CANCER

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https://doi.org/10.5281/zenodo.17233238

Relevance:

Non-muscle invasive bladder cancer (NMIBC) is characterized by a high recurrence rate and risk of progression. In settings where Bacillus Calmette–Guérin (BCG) immunotherapy is not available, intravesical chemotherapy remains the cornerstone of adjuvant treatment. However, data comparing different chemotherapeutic agents in routine practice remain limited.

Objective:

To assess the efficacy, tolerability, and comparative outcomes of intravesical chemotherapy regimens in patients with high-risk NMIBC following TURBT.

Materials and Methods:

This prospective study included 80 patients with high-risk NMIBC (Ta–T1, G3 and/or CIS) treated between 2022 and 2025. After complete TURBT, patients received intravesical chemotherapy with mitomycin C (n=32), doxorubicin (n=26), or epirubicin (n=22). Induction schedules consisted of 6–8 weekly instillations, followed by monthly maintenance for up to 1 year. Follow-up included cystoscopy and urinary cytology every 3 months during the first 2 years and every 6 months thereafter. Endpoints were recurrence-free survival (RFS), progression-free survival (PFS), and treatment-related adverse events. Statistical analysis applied Kaplan–Meier survival estimates and log-rank tests.

Results:

- **Recurrence:** Detected in 24 patients (30%). By regimen: mitomycin C – 21.9% (7/32), doxorubicin – 34.6% (9/26), epirubicin – 40.9% (9/22), p=0.04. Median time to recurrence was 11 months.
- **Progression:** Occurred in 10 patients (12.5%). Rates: mitomycin C – 6.3% (2/32), doxorubicin – 11.5% (3/26), epirubicin – 18.2% (4/22). Two-year PFS was 87.5% overall, but only 72% in the epirubicin group.
- **Survival outcomes:** Two-year RFS: 74% in mitomycin C, 62% in doxorubicin, and 59% in epirubicin groups. Patients treated with mitomycin C demonstrated the most favorable oncological outcomes.

• **Adverse events:** Local complications were reported in 15 patients (18.7%), including chemical cystitis (12.5%) and dysuria (6.2%). Grade II hematuria occurred in 3 patients (3.7%). No systemic toxicity or treatment discontinuation was observed.

• **Comparative efficacy:** Mitomycin C showed superior disease control compared with doxorubicin and epirubicin, although tolerability was similar across regimens.

Conclusion:

Intravesical chemotherapy is an effective and safe strategy for high-risk NMIBC in the absence of BCG immunotherapy. Mitomycin C demonstrated the best recurrence and progression outcomes among the studied regimens, while all drugs were well tolerated. Refining chemotherapy protocols and maintenance schedules could further improve long-term outcomes.

Keywords: Non-muscle invasive bladder cancer, intravesical chemotherapy, mitomycin C, doxorubicin, epirubicin, recurrence, progression

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