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A Case Study: Non-Invasive Papillary Bladder Cell Carcinoma

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Abstract: ***Non-invasive bladder cell carcinoma, commonly referred to as non-muscle invasive bladder cancer (NMIBC), is one of the most prevalent urological malignancies worldwide. It originates from the urothelial lining of the bladder and remains confined to the mucosa or lamina propria without invading the muscular layer. NMIBC accounts for approximately 70–75% of newly diagnosed bladder cancers. Risk factors include cigarette smoking, occupational exposure to aromatic amines, chronic bladder irritation, and genetic susceptibility. But older adult is commonly affected in this type of bladder cancer. It commonly affect in male. Early diagnosis is good prognosis for this condition.***

Keywords: Non-invasive bladder carcinoma, urothelial carcinoma, cystoscopy, TURBT

1. Introduction

Bladder cancer is among the most common malignancies affecting the urinary tract. Approximately 90% of bladder cancers are urothelial carcinomas. Non-muscle invasive bladder cancer (NMIBC) represents tumors confined to the bladder mucosa (Ta, carcinoma in situ) or lamina propria (T1) without invasion into the detrusor muscle. Although mortality rates are relatively low compared to muscle-invasive disease, recurrence and progression remain significant clinical challenges. Early diagnosis and appropriate management are essential to improve patient outcomes and reduce disease burden.

Epidemiology

- Bladder cancer is the tenth most common cancer globally.
- Men are affected three to four times more frequently than women.
- Peak incidence occurs after 60 years of age.
- Approximately 70–75% of newly diagnosed bladder cancers are non-muscle invasive.

2. Review of Literature

Roessler et al. (2026) conducted a systematic review and meta-analysis evaluating first-line therapies for BCG-naïve NMIBC patients. The study found that combining systemic immune checkpoint inhibitors with intravesical BCG improved recurrence-related outcomes compared with BCG alone, although severe treatment-related adverse events were more frequent.

Liu et al. (2025) performed a comprehensive review of recurrence and prevention strategies in NMIBC. The authors identified smoking, tumor size, tumor multiplicity, diabetes, and surgical factors as significant predictors of recurrence. They emphasized risk-factor modification and adherence to surveillance protocols as essential components of recurrence prevention.

Kwong et al. (2024) evaluated artificial intelligence (AI) applications in NMIBC outcome prediction. The review demonstrated that AI-based models can enhance prediction of recurrence and progression by integrating clinical, pathological, and molecular data, although further validation studies are required before widespread clinical implementation.

3. Risk Factors

Modifiable Risk Factors

- Cigarette smoking (major risk factor)
- Occupational exposure to chemicals
- Chronic urinary tract infections
- Long-term catheterization
- Exposure to arsenic-contaminated water

Non-Modifiable Risk Factors

- Advanced age
- Male gender
- Family history of bladder cancer
- Genetic predisposition

Pathophysiology

Non-invasive bladder carcinoma develops through genetic mutations in urothelial cells. Common molecular abnormalities include alterations in FGFR3, TP53, and RAS pathways. The transformed cells proliferate abnormally, forming papillary or flat lesions confined to the mucosal layer. Without treatment, some tumors may progress to muscle-invasive disease.

Case Study of Mrs. X

A 78 years old male has admitted in the hospital for the complaints of difficulty in urination, hematuria, drippling of urine. He has a past medical history for cerebral palsy for past 10 years back.

Clinical Manifestations

- Hematuria
- Urinary frequency
- Urgency
- Dysuria
- Drippling of urine

Diagnostic Evaluation

- Urinalysis
- Urine culture
- Urine cytology
- Ultrasound
- CT Urography

- PET scan

Endoscopic Examination
- Cystoscopy (gold standard)

Histopathology
- Transurethral Resection of Bladder Tumor (TURBT)
- Tumor grading and staging

4. Management

Surgical Treatment

Transurethral Resection of Bladder Tumor (TURBT)
Transurethral resection of bladder is the standard diagnostic and initial treatment procedure for non- invasive bladder cancer. The tumor is removed using an electrical wire loop attached to the resectoscope. The tumor is removed in pieces. A sample of the underlying bladder muscle is obtained to determine the cancer has invaded the muscle layer**.**

Nursing management
- Assess the urinary symptoms
- Record medical and surgical history
- Monitor vital signs
- Explain the TURB procedure and its purpose
- Inform about anesthesia and postoperative expectations
- Provide emotional support and reduce anxiety

Nursing diagnosis
- Impaired urinary elimination related to bladder tumor and surgical intervention
- Acute pain related to surgical procedure and bladder spasms.
- Anxiety related to diagnosis of cancer and
- Knowledge deficit regarding treatment
- Risk for infection related catheterization and surgical procedure

Complications
- Tumor recurrence
- Disease progression
- Hematuria
- Urinary obstruction
- Treatment related adverse effects

5. Conclusion

Non- invasive bladder cell carcinoma is a common urological malignancy chacterized by high recurrence but relatively low mortality when managed appropriately. Early diagnosis, complete tumor resection, risk stratified intravesical therapy, and regular surveillance are critical components of effective management. Advances in molecular diagnostic and targeted therapies are expected to improve future outcomes and reduce recurrence rates.

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