

# Does Retrograde Double-J Stenting in Bladder Urothelial Malignancy Predisposes for Tumour Seeding at Upper Urinary Tract: A Study From a Tertiary Care Hospital

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## ABSTRACT

**Introduction:** Urinary bladder cancer is among the leading cause of cancer related mortality in the developed world. Most post cystectomy early recurrence experienced within 1 to 2 years and involving mainly lung, liver or bony metastasis. Patients of bladder tumour may present with signs and symptoms of renal failure, owing to the ureteral obstruction.

**Material and Methods:** We retrospectively reviewed records of 860 patients, who were diagnosed as bladder mass between January 2007 to December 2014 in the Department Of Urology, Government Medical College Kota, Rajasthan. Forty six patients, who underwent double J stenting for management of renal failure in presence of bladder mass were included. Patients other than transitional cell carcinoma (TCC) of urinary bladder, having diagnosed concurrent upper tract TCC and those having incomplete records and follow up were excluded. Patients were analysed at follow-up visit at 3, 6 and 12 months.

**Results:** The mean age of the patients was  $48.23 \pm 18.6$  (38-71) years. Male were 93.4%. Patients were having deranged serum creatinine ranging from 2.3-11.7 mg/dl. Tumour histology was high grade in 36 patients (78.12%). Patients were followed regularly with mean follow up of 28 months. At the end of 1 year follow up 2 patients (4.34%) were detected of having upper tract transitional cell carcinoma.

**Conclusion:** Urothelial transitional cell carcinoma of urinary bladder has tendency of implantation. Risk of tumour seeding to the upper tract leading to upper tract TCC in clinically insignificant phenomenon after DJ stenting in urinary bladder TCC.

**Keywords:** Urothelial Malignancy, Double J Stenting, Tumour Seeding.

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## INTRODUCTION

Urinary bladder cancer is among the leading cause of cancer related mortality in the developed world.<sup>1</sup> Patients diagnosed as localized muscle invasive bladder cancer and underwent radical cystectomy have approximately 60% 5-year survival rate.<sup>2</sup> Most post cystectomy early recurrence experienced within 1 to 2 years and involving mainly lung, liver or bony metastasis.<sup>3</sup> Underlying hypothesis of this phenomenon suggest that these patients harbour systemic micrometastatic, which results in disease progression and poor outcome in these patients.<sup>4</sup>

Trans urethral resection of bladder tumour (TURBT) remain time tested gold standard procedure for initial management. Although the procedure is against the principles of oncology, here we remove the tumour in piecemeal fashion cutting through the tumour. For technical assistance, the bladder is irrigated with fluid

under pressure which may pose a risk of cancer cells migration into venous system or upper urinary tract during TURBT. Theoretically these urothelial cell may get implanted and give rise to new recurrence.<sup>5,6</sup>

Patients of bladder tumour may present with signs and symptoms of renal failure, owing to the ureteral obstruction. These patients may require urinary diversion either in the form of percutaneous nephrostomy or double J stenting (DJ stent). Procedure of DJ stenting also requires fluid irrigation of bladder and also tumour manipulation as well as travelling into upper tract directly. This leads to an uncertainty of seeding of urothelial malignant cell from bladder to the upper tract. We conducted this study to answer this uncertainty, regarding seeding of urothelial malignant cells from urinary bladder to upper urinary tract after DJ stenting.

**MATERIAL AND METHODS**

Our study was conducted in the Department Of Urology, Government Medical College Kota, Rajasthan. We retrospectively revised medical records of 860 patients, who were diagnosed as bladder mass between January 2007 to December 2014. Among these patients, 342 patients were having deranged renal function with signs and symptoms of renal failure. These patients were managed by multidisciplinary approach in collaboration with nephrologist. Patients were managed by dialysis and urinary diversion procedure either percutaneous nephrostomy or double J stenting whenever possible.

We included 46 patients in our study, who underwent double J stenting for management of renal failure in presence of bladder

mass. After optimization these patients underwent transurethral resection of bladder tumor (TURBT) and DJ stenting positioning. We excluded patients other than transitional cell carcinoma (TCC) of urinary bladder, having diagnosed concurrent upper tract TCC and those having incomplete record and follow up.

Clinical data, including clinical history, physical examination, renal function test, liver function test, urinalysis, urine for malignant cytology, serum prostate-specific antigen (PSA), chest X-ray, cystourethroscopy and abdominal ultrasound (USG).

Patients were analysed at follow-up visit at 3 months, 6 months and 12 months. At follow-up visit, we noted clinical history, physical examination, USG KUB, urine for malignant cells and CECT abdomen and pelvis or MRI depending on renal function.

**Table1: Patients characteristics and variables**

| Variables                                   | Patients (N=46)      |
|---|----------------------|
| <b>Age (Mean; SD) years</b>                 | 48.23 ± 18.6 (38-71) |
| <b>Sex</b>                                  |                      |
| Male  | 43 (93.4%)           |
| Female                                      | 3 (6.6%)             |
| <b>BMI Kg/m<sup>2</sup></b>                 | 22.4 ± 4.4           |
| <b>Tobacco intake</b>                       |                      |
| Yes   | 41(89.1%)            |
| No  | 5(10.9%)             |
| <b>Comorbidity</b>                          |                      |
| Diabetes                                    | 9(19.53%)            |
| Hypertension                                | 6(13.02%)            |
| <b>Serum creatinine mg/dl (Mean; range)</b> | 4.7 (2.3-11.7)       |
| <b>Tumor location</b>                       |                      |
| Right                                       | 24(54.08%)           |
| Left  | 18(39.06%)           |
| Both side                                   | 4(8.68%)             |
| <b>Histology</b>                            |                      |
| High grade                                  | 36(78.12%)           |
| Low grade                                   | 10(21.7%)            |
| <b>Tumor stage</b>                          |                      |
| pT1   | 2(4.34%)             |
| pT2   | 6(13.2%)             |
| pT3   | 38(82.46%)           |
| <b>Concomitant CIS</b>                      |                      |
| Yes   | 5(10.85%)            |
| No  | 41(88.97%)           |
| <b>Mean follow up (Mean; range), months</b> | 28.18 ± 4.6 (18-64)  |
| <b>Upper tract TCC at 12 months</b>         |                      |
| Yes   | 2(2.34%)             |
| No  | 44(95.48%)           |

**RESULTS**

We retrospectively analysed 46 patients with bladder mass with DJ stent in situ, who underwent TURBT and DJ stent replacement and completed 1 year follow up. The mean age of the patients was 48.23 ± 18.6 (Range 38-71) years. Majority patients were male 93.4% (43 out of 46). Patients were having deranged serum creatinine ranging from 2.3-11.7 mg/dl. Tumour histology was high grade in 36 patients (78.12%). Patients were followed regularly with mean follow up of 28 months. At the end of 1 year follow up only 2 patients (4.34%) were detected of having upper tract transitional cell carcinoma (Table-1).

**DISCUSSION**

Transurethral resection of bladder tumour (TURBT) combined with adjuvant or neo-adjuvant chemotherapy is considered the standard treatment for non-muscle invasive bladder cancer. The most common and dreaded reported complication after TURBT is bleeding and bladder perforation. This may occur in up to 6-8 % of resections. The primary oncological mishappening is tumour seeding leading to extra-vesical recurrence.<sup>7-14</sup>

The important experimental finding studied remarkable spikes in Circulating Tumour Cells (CTCs) in blood from the IVC immediately after TURBT. In some studies, it was found that

CTCs may increase from 0 to 28 in CV blood. This finding supports the hypothesis that urothelial malignant cells can be inadvertently entered into the circulation during any procedure manipulating bladder mass with irrigation of fluid.<sup>15-16</sup>

In our study, we studied 46 patients of urinary bladder TCC. These patients underwent pre-TURBT stenting for management of renal failure. After DJ stenting 33 patients (71.61%) recovered their renal function well. This improved quality of life and morbidity of these patients.

Patients were followed up for evidence of upper tract malignancy or tumour recurrence. At the end of 1 year follow up, only 2 patients (4.34%) developed upper tract TCC. This incidence of upper tract TCC with urinary bladder TCC is similar to the incidence described for general population, as described in literature.

Similar supporting evidence in literature suggested by Antoniewicz et al. study, they evaluated portal vein blood samples from 51 patients before, immediately after, and on days 3, 7 and 30 after TURBT with quantitative reverse transcriptase-polymerase chain reaction analysis on RNA isolated from the samples to measure CTCs.<sup>17</sup> Work done by Desgrandchamps et al. using monoclonal antibodies against 3 cytokeratins (CK8, 18 and 19) to detect CTCs before and 1 to 2 hours after TURBT in 25 patients. Both of these research studies found negative correlation of CTCs after TURBT.<sup>18</sup>

Our study evaluated patients with relatively long follow up period. We do not found increased risk of tumour seeding to the upper tract after DJ stenting in cases of TCC urinary bladder.

Our study is strengthened by the fact of being among first clinical study to evaluate risk of tumour seeding after DJ stenting in TCC bladder cases, which may impact patient management and prognosis of disease. We conducted long follow up of the patients. Limitation of our study is retrospective nature.

## CONCLUSION

Urothelial transitional cell carcinoma of urinary bladder has tendency of implantation. Risk of tumour seeding to the upper tract leading to upper tract TCC in clinically insignificant phenomenon after DJ stenting in urinary bladder TCC. Advantaged of DJ stenting for renal recovery outweigh the theoretical risk of tumour seeding in these patients.

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