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Original Article

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Comparison of Outcome of En-Bloc Resection and Conventional Transurethral Resection of Superficial Transitional Cell Carcinoma of Urinary Bladder

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Abstract

Background: *Transurethral resection of bladder tumour (TURBT) is considered as the gold standard in the surgical management of bladder tumour despite impressive advancement in en-bloc resection. However, the optimum method for resection of bladder tumour is yet to be established.*

Objectives: *This study has been designed to compare the outcome of en-bloc resection versus conventional resection of bladder tumour of superficial transitional cell carcinoma of urinary bladder patients.*

Methods: *This interventional study was carried out in the department of Urology, National Institute of Kidney Diseases and Urology, Dhaka from May 2020 to April 2021. Sixty Patients were selected by purposive sampling technique and allocated into two groups as group A- en-bloc resection and group B- conventional resection by randomization. All even numbers were select for ERBT and all odd Numbers for cTURBT.*

Results: *Volume of irrigation fluid (p = 0.001) and duration of operation (p= 0.024) were significant between ERBT and cTURBT. However, 3, 6, 9-month recurrence rate was not statistically significant between ERBT and cTUTBT. The incidence of complications such as obturator nerve reflex (p = 0.222) and bladder perforation (p = 0.301) were less frequent in the ERBT group. Mean duration of postoperative hospital stay in group A and group B were 3.38±1.12 and 3.57±1.23 days respectively, this difference was statistically not significant (p>0.05). There was no significant difference in categorical data between groups.*

Conclusion: *This study shows in comparison to conventional resection en-bloc resection shortens per operative complications, duration of operation & hospital stay and recurrence status during follow up.*

Keywords: En-bloc resection, conventional transurethral resection.

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Introduction:

Bladder tumor, the 9th most common tumor in the world, is responsible for the highest mortality rate in urinary tumors. Bladder cancer is the second most common cancer of the genitourinary tract and transitional cell carcinoma (TCC) accounts for more than 90% of bladder cancers. Risk factors that have been associated with bladder cancer include cigarette smoking, occupational exposure to chemicals from the aromatic amine family, chronic inflammatory changes in the bladder (due to persistent bladder stones, recurrent urinary tracy infections, indwelling catheters or schistosomiasis), chemotherapeutic treatment with cyclophosphamide.

During initial diagnosis, about 75% to 80% bladder cancers are non muscle invasive (also referred to as superficial) either confined to mucosa (Ta, CIS lesion) or invading the lamina propria (T_1 lesion). The diagnosis of bladder cancer ultimately depends on cystoscopic examination and histopathological evaluation of the resected tissue.

Transurethral resection of bladder tumour (TURBT) is the first and gold standard treatment option for NMIBC. TURBT should include detrusor muscle (muscularis propria) in the specimen in an attempt to rule out T_2 disease and minimize the risk of under staging. Over staging (27%) and under staging (34.64%) is a practical problem especially for high grade and intermediate stage of tumours.

The identification of detrusor muscle in the specimen is an important factor for future treatment and prognosis. However, staging is often inaccurate because of charring of resected tissues and absence of detrusor by TURBT. Finally, the re-staging TURBT has shown the presence of residual disease in up to 76% of cases.

Still, TURBT has certain disadvantages, such as dissemination and seeding as well as incomplete resection due to fragmentation of tumor tissues, which can potentially lead to a higher postoperative recurrence rate. Furthermore, the bladder tumour resected into fragments is contrary to the principle of tumour free technique. After the TURBT the probability of recurrence rate reaches 15-61% in 1year for TaT_1.

The first description of en-bloc resection was done 20 years ago by Ukai et al. (2000). In order to achieve the complete resection, en-bloc resection of bladder tumour (ERBT) has been gradually applied in the treatment of bladder tumour during the past year. It has the ability to resect neoplasm with a 1cm margin from the tumour base and precisely separate detrusor muscle as well as connective tissue and comply with oncological principles.

Although it appears impossible to endoscopically remove all bladder tumors by "en- bloc" resection due to tumor bulk, smaller tumors can be resected en-bloc and removed intact via the resectoscope. Several studies have confirmed the feasibility of en-bloc resection, using a variety of techniques such as knife electrode, holmium laser and modified 'J-loop'.

The risk for both recurrence and progression are related to multiple factors including histological grade, depth of invasion, multiplicity, tumour size, presence or absence of carcinoma in situ. Low grade Ta lesions recurred at a rate of 50%-70% and have a 5% chance of progression whereas high grade T1 lesions recurred in more than 80% of cases and progress to a higher stage in 50% of cases within 3 year.

Most previous comparative studies showed that the majority of ERBT recurrences developed at a new site within the bladder. Although the clinical recurrence rate between two approaches is controversial, less intra-operative and post- operative complications have been observed when undergoing ERBT. A meta-analysis published in 2016 revealed that ERBT had a lower 24 months recurrence rate than conventional TURBT. En-bloc resection of bladder tumour could reduce recurrence rates due to complete tumour removal and reduction of tumour disposal.

Methods:

Prospective interventional study (Quasi experimental study). Department of Urology, National Institute of Kidney Diseases and Urology (NIKDU), Dhaka. Study period was May 2020 to April 2021. Study population were the patients with superficial transitional cell carcinoma of Urinary bladder admitted in the department of Urology, NIKDU, Dhaka. Considering the logistic and economic constraint as well as time limitation 60 patients was enrolled in the study and 30 patients for each group. Sampling technique was purposive sampling technique was applied to collect sample.The data was processed manually and was analyzed on SPSS (Statistical package for social sciences). Mean, standard deviations were used for description of quantitative data and frequencies and

proportions for categorical or dichotomous data. Tests of significance were unpaired student t-test for quantitative outcome data and Chi-square (X^2) test or Fisher 's test for categorical outcome data. 95% confidence interval was used. p-value of less than 0.05 was considered significant. The summarized findings were then presented in form of tables.

Results:

Volume of irrigation fluid (p = 0.001) and duration of operation (p= 0.024) were significant between ERBT and cTURBT. However, 3, 6, 9-month recurrence rate was not statistically significant between ERBT and cTUTBT. The incidence of complications such as obturator nerve reflex (p = 0.222) and bladder perforation (p = 0.301) were less frequent in the ERBT group. Mean duration of postoperative hospital stay in group A and group B were 3.38±1.12 and 3.57±1.23 days respectively, this difference was statistically not significant (p>0.05). There was no significant difference in categorical data between groups.

Discussion:

The most frequently discussed issue for cTURBT were the risk of tumor cell scattering, tumor cell implantation, incomplete resection, missing detrusor muscle and thermal damage of specimens.

The ERBT technique which aims to remove the tumor from the detrusor layer without destroying the tumor integrity. Thus, resection quality can be improved, and the number of repeat transurethral bladder tumor resections (Re-TUR) can be reduced.

Keeping in this view this study was conducted to find out the efficacy of en-bloc resection of bladder tumour (ERBT) to that of conventional transurethral resection of bladder tumour (cTURBT) in preventing the recurrence of superficial transitional cell carcinoma of urinary bladder.

In this prospective interventional study, 60 patients were enrolled and divided in two groups- group-A and group-B. Mean age was 58.62±5.68 (range 40-82 years) in group-A and 55.62±5.14 (range 40-54 years) in group-B which were almost homogenously distributed. In study of Sureka et al. (2014) observed that mean age was 52.6±12.2 and 55±13.6 years in ERBT and cTURBT group respectively.

In this current study it was observed that 25(83.3%) patients in group-A and 24(80%) patients in group-B were male. 5(16.7%) patients in group-A and 6(20.0%) patients in group-B were female. Male to female ratio in group-A and group-B was 5:1 and 4:1 respectively. In study of Bangash et al. (2020) observed that 70 (85.4%) were male patients and 12 (14.6%) were female patients; hence the overall proportions of male to female were 6:1.

In this study mean size of the tumour were 21.0±4.83 mm in group-A and 20.1±5.20 mm in group –B. Calculated p value was 0.490 which is not statistically significant (p>0.05). Single number of tumour was found 21(70.0%) in group-A and 18(60.0%) in group-B. Multiple number of tumour (2-3) was found 9(30.0%) in group-A and 12(40.0%) in group-B. The difference was not statistically significant (p>0.05) between two groups. Hurle et al. (2016) study assessed median tumour size was 21.98±0.59 with median number of resected tumours per patient of 1. (1-4).

In this study tumour stage Ta was found 19(63.3%) in group- A and 22(73.3%) in group –B. Tumour stage T_1 was found 11(36.7%) in group –A and 08(26.7%) in group –B. The difference was statistically not significant (p>0.05) between two groups. Liu et al. (2013) observed similar finding over 64 patients with Ta 37 patients and T_1 27 patients.

In this study, the mean duration of operation for ERBT (group-A) was 48.2±9.25 minute and 53.4±8.13 minute for cTURBT (group-B). The difference was statistically significant (p<0.05) between two groups. Similar results were obtained by Bangash et al. (2020) showed median operative time [interquartile range- (IQR)] was significantly shorter in the en bloc group, i.e., 30 (25–39.5) minutes as compared to 45 (33–63.5) minutes in the conventional group (p < 0.001). In this study the mean volume of irrigation fluid required during operation ERBT (group–A) was 21.5±3.12 litre while in cTURBT (group- B) it was 30.25±4.62 litre and the difference between the two group was found to be statistically significant with p value 0.001.

Mean hospital stay for ERBT was 3.38±1.12 vs. 3.57±1.23 days for the conventional TURBT group (p=0.530). Migliari et al. (2015) found 58.5 hour (range 40-98 hour) and 47.5 hour (range 36-96 hour) for ERBT and cTURBT group respectively.

Complications in both approaches are- In ERBT group only one patient develop extraperitoneal bladder perforation which was managed by catheterization for 10 days before discharge and one patient with intraoperaive haemorrhage did not require blood

transfusion. In cTURBT group 3(10.0%) patient develop extraperitoneal bladder perforation and 4(13.3%) patients with intraoperative bleeding require blood transfusion. Intraoperative obturator nerve reflex occurred in both groups (16.7% and 30.0% in ERBT and cTURBT groups respectively).

In group-A ERBT patients recurrence status at 3rd, 6th, 9th month of follow up shows 2(22.2%), 4(23.5%), 7(25.9%) recurrence respectively. In group-B cTURBT patients recurrence status at 3rd, 6th, 9th month of follow up shows 4(44.4%), 7(41.2%), 11(40.7%) recurrence respectively. Recurrence status at 9th month of follow up cystoscopy was statistically significant. Chen et al. (2015) randomized comparative study results almost congruently match to my study with recurrence rate in ERBT & cTURBT was 4/71(5.63%) & 7/71(9.86%) respectively.

The result of present study is compatible and consistent with international studies. In this study, follow up of each patient was done for 9month after initial ERBT/ cTURBT. Recurrence patients treated accordingly with transurethral resection with intravesical chemotherapy/immunotherapy. However, at the end of study, follow-up has been continuing as per EAU (European Association of Urology) guidelines on urothelial carcinoma of the lower urinary tract.

Conclusion:

ERBT was superior to cTURBT in terms of shorter duration of operation and hospital stay and lower recurrence free rate at 3rd, 6th, 9th month of follow up. ERBT has less acute bleeding, bladder perforation and obturator nerve reflex Moreover, it can provide a better tumour specimen for pathological evaluation.

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