

Orthotopic Neobladder Urinary Diversion for Carcinoma of Urinary Bladder

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ABSTRACT

Background: Invasive cancers of urinary bladder need radical cystectomy as an optimal treatment. Urinary diversions of different types are available after the procedure. Orthotopic neo-bladder reconstruction is an emerging technique of diversion in suitable patients. The aim of this study was to see the outcome of this procedure in our set up.

Methods: The patient with carcinoma of urinary bladder who underwent radical cystectomy and orthotopic neo-bladder reconstruction during five year period were included in the study from department of surgical oncology in a hospital. Studer type ileal pouches were made in all the patients and their outcomes were studied.

Results: There were 30 patients among which 28 were male and 2 female. Age ranged from 38-60 years with mean age of 49.6 years. Average operative time was 330 minutes. Average hospital stay was 16 days (range 14-30 days). Majority of patients were transitional cell carcinoma 26 (86.7%) in histology. Majority of cases presented in stage II (53.3%). Post-operative complications were ileus in 30%, urinary leak in 26.6% and pneumonia in 13.3% of patients. Mortality was 1 (3.3%) on 29th postoperative day. Patients were able to micturate with satisfactory stream postoperatively.

Conclusions: Orthotopic neobladder has similar complication rates compared with other forms of continent diversions. This method gives less psychological trauma to the patients with higher acceptance. So we recommend transforming the technique from ileal conduits to neobladder in well-established pelvic reconstruction set ups.

Keywords: carcinoma urinary bladder; orthotopic neobladder; urinary diversion.

INTRODUCTION

An orthotopic neobladder is a reservoir created during surgery that replaces urinary bladder. In this procedure, bladder is removed and a new pouch from a segment of intestine is made and kept in the pelvis connected to the ureter and urethra. It allows individual to be continent and void through the natural urethra even after absence of urinary bladder.

Carcinoma of urinary bladder (CUB) is the 12th most common malignancy visiting B. P. Koirala Memorial Cancer Hospital (BPKMCH) for treatment. CUB is the most common urological malignancy in the hospital.¹ For

those patients with superficial tumours, treatment is a transurethral resection. For those with recurrence and invasive tumours, radical cystectomy with pelvic lymph node dissection is the treatment of choice.² We followed National Comprehensive Cancer Network (NCCN) and other oncology guidelines to manage the disease which involved multidisciplinary approach.³ Majority of invasive bladder cancers underwent radical cystectomy with pelvic lymph node dissection if they have no restricting medical co-morbidities. Studer type pouch out of many choices is used to create a neobladder in cases meeting criteria.^{4,5} In addition to this, a flap of

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omentum is created and kept in the pelvis wrapping the anastomotic site and keeping the bulk of it behind the pouch.⁶

METHODS

An observational study was conducted at department of surgical oncology of BPKMCH from May 2006 to May 2011. Patient with medical fitness along with Age ≤ 60 years, tumour not located in the bladder outlet, normal renal function tests, ASA category I and II, no mental disorder, and patient’s willingness for this type of urinary diversion were included in the study. Those patients with carcinoma of urinary bladder who didn’t undergo orthotopic neobladder surgery were excluded. Ethical approval was taken from the institutional review committee. Statistical analyses were done using statistical package for social sciences (SPSS) version 16 for windows.

RESULTS

There were total of 30 patients underwent this type of reconstructive surgery during the study period. The minimum age was 38 and maximum was 60 years with mean age of 49.6 years. Male were 28 and female were 2. Average onset of symptoms of carcinoma of urinary bladder was from 3 months to 5 years. Average haemoglobin level before operation was 12.6 mg/dl, albumin level 3.6 mg/dl. Average operative time was 330 minute, blood loss was 800 ml and average hospital stay was 16 days (range 14 to 30 days). Among 30 patients, 16 (53.3%) were in TNM stage II of tumor (Table 1), Transitional cell carcinoma was 26 (86.7%) in pathological types (Table 2) and major post-operative complication was Ileus 9 (30%) (Table 3). There was one (3.3%) mortality on 29th postoperative day following bowel obstruction.

Table 1. TNM staging of UB carcinoma (n=30)

TNM staging	Number of patients (%)
I	1 (3.3)
II	16 (53.3)
III	13 (43.3)

Table 2. Pathological Types of UB cancers (n=30)

Pathological type	Number of patients (%)
Transitional cell carcinoma	26 (86.7)
Squamous cell carcinoma	2 (6.7)
Sarcomatoid cancer	1 (3.3)
In situ cancer of UB	1 (3.3)

After removal of Foleys catheter, voiding required some training. Patients were taught to perform a pelvic floor relaxation and also to increase the abdominal pressure

by contracting the lower abdominal wall. After a period of training, patients were able to micturate with proper stream of urine. Transient incontinence was observed in 3 patients that settled in a week. Urine incontinence was nil in day time. Results were equally good with 2 female patients.

Table 3. Major post-operative complications (n=30)

Complications	No. of patients (%)
Ileus	9 (30)
Urinary leak	8 (26.7)
Pneumonia	4 (13.3)
Pouchitis	1 (3.3)
Hyponatremia	1 (3.3)

DISCUSSION

Since early 1900s, innovative surgeons have investigated how best to replace the original bladder removed for either benign or malignant disease.^{7,8} In the new millennium, the goals of lower urinary tract reconstruction are evolving from more than simply a means to divert urine and protect the upper urinary tract. Contemporary objectives of lower urinary tract reconstruction should consider quality of life issues, including eliminating the need for a cutaneous urostomy, the need for a urostomy appliance, and the need for intermittent catheterization while maintaining a more natural voiding pattern that allows micturation through the intact native urethra.⁸ These advances in urinary diversion have been made in an effort to provide patients with a more normal lifestyle and improved quality of life and self-image after removal of the bladder.

The first reported urinary diversion into a segment of bowel was done by Simon in 1852.² Since 1950s, the evolution of lower urinary tract reconstruction has developed along three distinct paths: a noncontinent cutaneous form of urinary diversion (ileal or colon conduit); a continent cutaneous form of urinary diversion to the skin (continent cutaneous); and, most recently, an orthotopic form of diversion to the native, intact urethra (neobladder).² Lemoine was credited with performing the first orthotopic reconstruction in a human subject. In 1979, Camesy and co-workers reported their pioneering and extensive experience with orthotopic substitution to the native urethra.⁸ This was a substantial accomplishment that demonstrated the feasibility of lower urinary tract reconstruction to the native urethra. Arguably, the orthotopic bladder substitute has evolved into the most ideal form of urinary diversion available today, and may be considered the gold standard with which other forms of diversion are compared.⁹ In general, patients considered appropriate surgical candidate for cystectomy should also be potential

candidate for lower urinary tract reconstruction.^{10,11} Many contemporary series report morbidity of 10-50% and mortality of <5% in cystectomy.^{12,13} Our results are also within these limits. It has been identified that several factors were associated with the development of a complication, including age, dependent functional status, preoperative dyspnoea, preoperative acute renal failure, chronic steroid use, preoperative alcohol consumption, American Society of Anaesthesiology score, use of general anaesthetic, operative time, intraoperative blood requirement and surgeon level of training as shown by analysis of The National Surgical Quality Improvement Program (NSQIP).¹⁴ These warrant optimization prior to surgery. We understand the number of patients in this study is still too small and outcome need to be validated in larger patient cohorts with their follow up data to see the long term outcomes.

CONCLUSIONS

Orthotopic neobladder reconstruction method has similar complication rates compared with the other forms of urinary diversions. This method gives less psychological trauma to the patients with higher acceptance. We performed Studer type pouch in 30 patients with a good safety record. Though peri-operative mortality is 3.3%, this is well accepted for all cystectomy patients. So we recommend transforming the technique from ileal conduits to neobladder in well-established pelvic reconstruction set ups.

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