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ORIGINAL ARTICLE

Orthotopic Neo-Bladder Repair Indications and Functional Results after Radical Bladder Cancer Cystectomies

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ABSTRACT

Objective: Our objectives were to list the surgical problems, assess the functional results, and communicate our indications for ONB reconstruction.

Study Design: Retrospective/cross sectional study

Methods: There were 35 instances in all that had ONB reconstruction following RC for bladder cancer. Sociodemographic information, clinical and pathological information, surgical indications, voiding, and metabolic outcomes at six and twelve months after surgery were among the data gathered. Using IBM-SPSS version 24.0, data analysis was carried out.

Results: The included cases had mean age 58.38±12.76 years. There were 22 (62.9%) males and 13 (37.1%) females among all cases. Twenty-six (74.3%) and twenty-four (68.6%) of the children had acceptable nocturnal and diurnal continence at 12 months. In 28 patients (80%), the peak urine flow rates were acceptable, and in 29 patients (82.9%), the post-void residual volumes were acceptable. At 12 months after the inception of the ONB, 30 persons (85.7%) had normal sodium levels, 32 had normal potassium levels, and 33 had normal chloride levels.

Conclusion: Our results provide valuable information about the functional outcomes linked to ONB reconstruction, showing that it produces acceptable incontinence and low rates of electrolyte imbalance.

Keywords: ONB, RC, Bladder Cancer

INTRODUCTION

In Canada, bladder cancer is the sixth most frequent type of cancer. Each year, bladder cancer claims the lives of about 2300 Canadians, and about 8300 receive a diagnosis.First, the standard of care for patients with muscle-invasive disease, which affects around one-third of patients with non-metastatic bladder cancer, continues to be neoadjuvant chemotherapy and radical cystectomy[1, 2]

Selecting the urinary diversion technique requires careful consideration of maintaining quality of life after radical cystectomy. Although the conventional method of urine diversion involves an ileal conduit, some patients prefer an orthotopic continent diversion (neobladder) in order to improve their quality of life after surgery[3,4] By creating a neobladder, patients can avoid a stoma and void through the urethra.Comparing patients with an ileal conduit to those who receive a neobladder, the former frequently exhibit greater psychological and physical health[5].

Ideally, neobladders serve as a reservoir for fluid, facilitating effective urethral emptying. Patients should be informed about the possibility of both urine retention and incontinence, though[6] Studies have revealed wide variations in risk, which now limits our ability to predict neobladder function accurately. For instance, there have been reports of complete day and night continence rates as low as 22% and as high as 63% one year after surgery[7,8]

Because bladder cancer has a high rate of morbidity, surgical therapy is essential. The gold standard for treating MIBC is a radical cystectomy together with either incontinent or continent urine diversion[9]. There are three main and commonly utilized options for urine derivation that must be linked to radical cystectomy: cutaneous ureterostomy, ileal conduit (IC), and continent reservoir. When continent reservoirs are successful, patients can attain diurnal continence or continue to void voluntarily, while intermittent catheterization may be necessary in certain cases[10]. After a radical cystectomy, an orthotopic neobladder (ONB), a bladder substitute built in the pelvis where the native bladder once was, is becoming a more and more popular technique for urine diversion.

Unlike options like ureterosigmoidostomy or IC, ONB reconstruction can give continence without requiring the creation of a stoma, which makes it very popular. More than 60% of patients have been found to experience psychosocial effects from stoma development, which is frequently necessary with IC[11]. In addition, ONB urine diversion is linked to a lower rate of post-operative morbidity than ileal conduit urinary diversion[12].

Despite ONB's increasing use worldwide, little is known about its reconstruction and results in Cameroon. By outlining the associated surgical problems, assessing the functional results, and discussing our indications for ONB reconstruction, this research seeks to close this information gap. We hope to improve knowledge of this process and offer insights to predict its different results by sharing our expertise.

MATERIALS AND METHODS

This retrospective/cross sectional study was conducted at Bannu Medical College during march 2022 to January 2023 and the study comprised of 35 cases. All patients treated for bladder malignancies at Nkwen Baptist Hospital during the study period who had ONB reconstruction after radical cystectomy were included in the study. The study excluded patients with incomplete medical records and those without a minimum of one year of follow-up.

We examined the data to determine who had undergone orthotopic bladder repair and radical cystectomy during the study period. Sociodemographic data, histological evaluation, post-void volume remaining, peak urine flow costs, serum potassium, salt, chlorine, and other post-operative issues were among the important details gathered for eligible patients using data entry sheaths. We collected and examined their medical record numbers to make sure they satisfied the inclusion and exclusion criteria.

The ureters are stented after being spatulated and anastomosized to the intestinal mucosa. By sealing the tube above the ureters, a reflux prevention mechanism is established. The bag is anastomosed to the urethral stump via a 24F catheter once the associated anatomotic tube hole in the neo-bladder's most distal point has been created and prepped. We next use a running suture to seal the front wall from side to side.

Following coding and completion verification, all gathered data was transferred to an Excel spreadsheet for descriptive analysis. Continuous variables are shown as means with standard deviations or, if appropriate, medians with interquartile ranges, whereas categorical variables are represented as frequencies and percentages.

RESULTS

The included cases had mean age 58.38±12.76 years. There were 22 (62.9%) males and 13 (37.1%) females among all cases. Majority were married. 15 (42.9%) cases were educated. 19 (54.3%) cases had history of smoking.(table 1)

Table-1: Demographics of the presented cases

Variables	Frequency	Percentage
Mean age (years)	58.38±12.76	
Gender		
Male	22	62.9
Female	13	37.1
Marital Status		
Married	24	68.6
Unmarried	11	31.4
Education status		
Yes	15	42.9
No	20	57.1
Smoking History		
Yes	19	54.3
No	16	45.7

Hypertension was the most common comorbidity found in 18 (51.4%) cases, followed by recurrent cystitis in 10 (28.6%) cases.(figure 1)

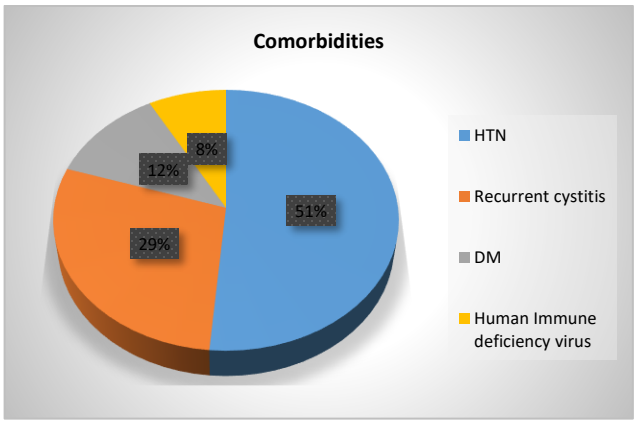

Figure-1: Associated comorbidities among all cases

Twenty-six (74.3%) and twenty-four (68.6%) of the children had acceptable nocturnal and diurnal continence at 12 months.(table 2)

Table-2: Nocturnal/ Diurnal continence

Variables	Frequency	Percentage
Nocturnal		
No pad	26	74.3
1-2 pad	6	17.1
>2 pad	3	8.6
Diurnal		
No pad	24	68.6
1-2 pad	5	14.3
>2 pad	6	17.1

In 28 patients (80%), the peak urine flow rates were acceptable, and in 29 patients (82.9%), the post-void residual volumes were acceptable. (table 3)

Table-3: Urinary flow rate and voiding function

Variables	Frequency	Percentage
Post-void residual volumes		
<50ml	29	82.9
>50 ml	6	17.1
Urine Flow rates		
<16mls	7	80
>16mls	28	80

DISCUSSION

The most effective treatment for people with muscle-invasive bladder cancer is radiation cystectomy combined with urine diversion[13]. Numerous urinary diversion techniques are currently available to patients and surgeons in urological practice, such as continents options (continent sigmorectal urinary diversion, continent catheterizable the urinary diversion, as well as orthotopic bladder substitution) and incontinent methods (ureterocutaneostomy, ileal conduit, colonic, and conduit)[14].

In order to ascertain the causes of ortohopic neo-bladder reconstruction after radical cystectomy and assess the practical results (hygiene, voiding, and serum electrolyte status) for individuals up to a year later, a prior study was carried out at Nkwen Baptist Hospital in Cameroon.

The effectiveness of ONB reconstruction depends on the right patient selection because the cancer control attained by possibly curative surgery shouldn't be jeopardized[15]. Only patients with stage 2 and multifocal stage 1 illnesses without bladder, neck, or ureteral tumor extension were evaluated for an ONB reconstruction out of the 18 patients in this retrospective review.

After surgery, neo-bladder patients frequently experience both daytime and nighttime incontinence, however these symptoms eventually go away. Maximum control of voiding sometimes takes 9–12 months after surgery, and continence rates usually improve progressively as the neo-bladder volume grows[16]. Within 24 hours following a radical cystectomy with ONB development, 80% of the individuals in our sample were continent. The 60.5% daytime and overnight continence rate reported by Singh et al. in 2019[17] is just slightly lower than this.

We saw a slight rise in urine retention as time passed. At least 50 milliliters per second was the post-void residual volume after a year in 20% of the participants in our research who had urine retention. This is similar to what Nayak et al. (2018) found, which showed a similar increase in partial or complete retention of urine over time[18].

The prevalence and cause of this issue were identified in a single institution series of 655 men. Inadequate emptying was observed in 75 (11.5%) of the patients, which is defined as a leftover urine volume greater than 100 mL. The endoscopic management allowed the remaining patients to resume full bladder emptying, but 14 of the 52 (7.9%) patients who encountered mechanical obstruction—that is, harmless limitations of the neovesicourethral anesthesia or local tumor recurrence—necessitated long-term catheterization [18].

Twenty percent of patients saw a decline in peak flow rates at 12 months, but Nayak et al.'s research revealed no change in maximum flow levels[19]. Since the intestinal mucosa is more permeable to electrolytes, which a neo-bladder permits more electrolyte metabolic changes in urine that could be absorbed systemically. The absorption of hydrogen, potassium, and chlorine ions can cause a metabolic acidosis that is hyperchloraemic and hyperkalaemic[20].

Serum electrolyte levels gradually returned to normal between one and twelve months after the neo-bladder was created. This may be understood by the ileal segment's gradual loss of microvilli or mucosal atrophy, which enhances the barrier properties and reduces the segment's secretive and absorptive capacities[21].

CONCLUSION

Our results provide valuable information about the functional outcomes linked to ONB reconstruction, showing that it produces acceptable incontinence and low rates of electrolyte imbalance.

REFERENCES

1. Advisory committee on cancer statistics. Canadian Cancer Statistics 2015. Toronto, ON: Canadian Cancer Society; 2015.
2. Hsu T, Black PC, Chi KN, et al. Treatment of muscle-invasive bladder cancer in Canada: A survey of genitourinary medical oncologists and urologists. Can Urol Assoc J. 2014;8:309–16.

3. Yafi FA, Kassouf W. Radical cystectomy is the treatment of choice for invasive bladder cancer. Can Urol Assoc J. 2009;3:409–12.
4. Cerruto MA, D'Elia C, Siracusano S, et al. Systematic review and meta-analysis of non-RCTs on health-related quality of life after radical cystectomy using validated questionnaires: Better results with orthotopic neobladder vs. ileal conduit. Eur J Surg Oncol. 2016;42:343–60.
5. Bjerre BD, Johansen C, Steven K. Health-related quality of life after cystectomy: Bladder substitution compared with ileal conduit diversion. A questionnaire survey. Br J Urol. 1995;75:200–5.
6. Meyer JP, Blick C, Arumainayagam N, et al. A three-centre experience of orthotopic neobladder reconstruction after radical cystectomy: Revisiting the initial experience and results in 104 patients. BJU Int. 2009;103:680–3.
7. Goldberg H, Baniel J, Mano R, et al. Orthotopic neobladder vs. ileal conduit urinary diversion: A long-term quality-of-life comparison. Urol Oncol. 2016;34:121.
8. Chang DT, Lawrentschuk N. Orthotopic neobladder reconstruction. Urol Ann. 2015;7:1–7.
9. Grimm T, Grimm J, Buchner A, Schulz G, Jokisch F, Stief CG et al (2019) Health-related quality of life after radical cystectomy and ileal orthotopic neo-bladder: effect of detailed continence outcomes. World J Urol 37(11):2385–2392
10. Hautmann RE, Abol-Enein H, Hafez K, Haro I, Mansson W, Mills RD et al (2007) Urinary Diversion. Urology 69(1):17–49
11. Philip J, Manikandan R, Venugopal S, Desouza J, Javlé PM (2009) Orthotopic neo-bladder versus Ileal conduit urinary diversion after cystectomy—a quality-of-life based comparison. Ann R Coll Surg Engl 91(7):565–569
12. Browne E, Lawrentschuk N, Davis NF (2020) A systematic review and meta-analysis of the long-term outcomes of ileal conduit and orthotopic neo-bladder urinary diversion. Can Urol Assoc J. 15(1): E48
13. Lee RK, Abol-Enein H, Artibani W, et al. Urinary diversion after radical cystectomy for bladder cancer: options, patient selection, and outcomes. BJU Int 2014; 113:11–23.
14. Furrer MA, Roth B, Kiss B, et al. Patients with an orthotopic low pressure bladder substitute enjoy long-term good function. J Urology 2016; 196:1172–1180.
15. Lebret T, Cour F, Benchetrit J, Grise P, Bernstein J, Delaporte V et al (2008) Treatment of postprostatectomy stress urinary incontinence using a minimally invasive adjustable continence balloon device, ProACT: results of a preliminary, multicenter, pilot study. Urology 71(2):256–260
16. El-Helaly HA, Saifelnasr MK, Mohamed KM, Abdelaziz AS, Youssof HA (2019) Outcome of orthotopic sigmoid versus ileal neo-bladder reconstruction. Urol Ann 11(2):204–210
17. Singh UP, Jena R, Madhavan K, Kumar N, Sureka SK, Srivastava A (2019) Radical cystectomy and W-shaped ileal orthotopic neo-bladder reconstruction with serosa-lined tunneled ureteroileal anastomoses: a critical analysis of the short-term voiding patterns and urodynamic and functional outcomes. Indian J Urol 35(2):121–128
18. Nayak AL, Cagiannos I, Lavallée LT, Morash C, Hickling D, Mallick R, et al (2018) Urinary function following radical cystectomy and orthotopic neo-bladder urinary reconstruction. Can Urol Assoc J 12(6):181–186
19. Qu LG, Lawrentschuk N (2019) Orthotopic neo-bladder reconstruction: patient selection and perspectives. Res Rep Urol 11:333–341
20. Iberti C (2007) Metabolic and histological complications in ileal urinary diversion. Challenges of tissue engineering technology to avoid them. Eur Rev Med Pharmacol Sci 11(4): 257–264
21. Tostivint V, Verhoest G, Cabarrou B, et al. Quality of life and functional outcomes after radical cystectomy with ileal orthotopic neobladder replacement for bladder cancer: a multicentre observational study. World J Urol 2020;