Egyptian Journal of Surgery Vol. (19), No. (1), Jan., 2000

CONTINENT ILEOCAECALBLADDER AFTER CYSTECTOMYFOR BLADDER CANCER

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Most patients with carcinoma of the bilharzial bladder would be good candidates for ileocaecal bladder, since the trigone is rarely affected by the neoplasm (5.7%) and the prostate is involved in only 6% of cases. Ileocaecal bladder could also be performed in patients with non-bilharzial bladder cancer in males, even if the bladder neck is involved because the lower limit of resection in such patients could still be just above the apex of the prostate. Sixty male patients with T2 or T3 bladder cancer were divided into 2 equal groups, first group: Radical cystectomy (RC) and rectal bladder (25 case) or ilial conduit (5 cases) was done. For the 2nd group modified radical cystectomy (MRC) and ileocaecal bladder (ICB) was done. The patients were followed up for 2-5 years. Prostatic infiltration was 10% and seminal vesicle 3.3%. Postoperative mortality was 16.7% and 20% in RC and MRC groups respectively. There was suprapubic leakage in 6.6 in MRC patients; the pelvic recurrence was 28% and 25% in both groups. Diurnal continence was 79.2% in MRC group and potency was 68.2%. The preservation or improvement of renal configuration was 58% and 83.3% in both groups. The actuarial 5-year survival rate was 40% in the MRC group. Ileocaecal bladder reconstruction is an attempt to overcome the inevitable social inconveniences resulting from cystectomy and standard diversion procedures. It is therefore gratifying that most of the patients were fully satisfied with continence obtained.

Key words: *Radical Cystecomy, Modified Radical Cystectomy, Cancer Bladder, Ileocaecal Bladder, Urinary Diversion.*

INTRODUCTION

Bladder cancer is the commonest malignancy in the Egyptian males. It represents 30% of all cases managed at the National Cancer Institute, Cairo University [1]. This high incidence in Egypt is an endemic national wide problem. The primary therapeutic modality for these patients is surgery in the form of radical cystectomy with prostato-seminal vesiculectomy and bilateral lymph adenctomy followed by urinary diversion.

Following such surgery male patients are left with two main problems namely impotence and the presence of a stoma which have a devastating psychological impact on their life [2].

Pathological examination of the bladder; cancer specimens revealed the rare involvement of the prostate by the tumor, 6% [3] and 12% [4], with no accurate figures for the involvement of the seminal vesicles [5]. Based on these observations together, careful study of the anatomy of the bladder neck and knowledge of the exact location of the pelvic autonomic nerves and their relation to the prostate and seminal vesicles was attempted at the Surgical Oncology Unit, Mansoura University. The aim is to preserve potency and provide a vascular bed that could allow easy anastomosis with a gut segment that will act as a new urinary reservoir. This vascular bed preserves the external urethral sphincter which is important in continence [6]. Thus solving the two morbidity problems following surgery for bladder cancer.

The aim of this work is to evaluate the incidence of involvement of the prostate and the seminal vesicles with cancer situated at or close to the bladder neck (the most liable to involve the prostate) in an attempt to justify the technique of modified radical custectomy and evaluate the incidence of potency and continence following this technique.

MATERIALS AND METHODS

This study includes 60 patients with bladder cancer managed at the Surgical Oncology Unit, Mansoura University, through the period 1984-1995. All cases were males with mobile bladder cancer (T_2 or T_3) as proved by examination under anaesthesia and a posterior basal location of the tumor at or close to the bladder neck (a distance not more than 4cm) as evidenced by cystoscopy and later by examination of the operative specimen.

For every patient the following was done: General and local examination, routine laboratory work up, X-ray chest, IVU and cystoscopy. Potency was evaluated postoperatively and followed up by the direct questionnaire method.

The patients were randomly divided into two equal groups each of which contains 30 patients. For the first group, standard radical cystectomy (RC) was done with rectal bladder (RB) or ileal conduit (IC) diversion (25 cases and 5 cases respectively). The specimens of these patients were examined pathologically to detect the method of spread of the tumor to the prostate and seminal vesicles. In the second group modified radical cystectomy (MRC) was done i.e. preservation of the prostate and seminal vesicles with ileocaecal bladder (ICB).

* Surgical technique*:*

The patients were explored through a long right paramedian incision extending from the symphysis pubis to about 5cm above the umbilicus.

Dissection of the iliac lymph nodes was done on both sides. After the posterior dissection and division of the lateral and posterior pedicles of the bladder, a vaginal clamp was applied about 2.5cm below the lower border of the tumor and the bladder was resected at this level. An adequate safety margin was assured. by frozen section examination. The lower limit of the resection was always dictated by the lower border of the tumor (Table 3).

Table (3): *Level of transection of cystectomy specimen (n=60)*

Level	*No.*	*%*
RC:		
- Membranous urethra	30	50
MRC:		
- 2cm above the bladder neck	4	6.7
- At the bladder neck	23	38.3
- Middle of the prostatic urethra	3	5

The ileocaecal region was mobilised and isolated on the ileocolic artery (Figs. I, A & B). The ileal part was about 10cm and the caecal part about 20cm long. The ileum was then anastomosed to the ascending colon to restore continuity of the bowel. The ureters were anastomosed to the ileal part of the new bladder, either end-to-end or end-to-side (Fig. 1 C_1&C_2). The cut end of the ascending colon in the ileocaecal segment was closed in two layers using 3/0 Vicryl sutures. Appendectomy was performed. The lower part of the caecum was anastomosed to the prostatic urethra or to the bladder neck (Fig. 2), using one layer of interrupted 3/0 polyglycoilic acid sutures and a Foley urethral catheter was inserted. The average operating time was 4 to 4.5 hours. The estimated blood loss was 500 to 1500m1.

The patients were followed up clinically every 3 months, assessment of the kidney function every 6 months and an IVU should the laboratory tests, show a progressive rise. Other investigations were needed to exclude local recurrence or distant metastasis such as isotopic scanning MRI, CT. Even in cases with MRC group with suspected recurrence, operative exploration and biopsy may be done as the presence of the prostate and seminal vesicle, might confuse the rectal examination.

RESULTS

Age, clinical staging, histopathology, grading and pathological staging are shown in (Table 1).

Table (1): ***Patients criteria***

	RC (n=30)	***MCR (n=30)***
*Age in years:		
Mean	44	43
Range	20-65	10-66
*Clinical staging:		
T2	3	3
T3	26	27
T4	1	
*Histopathology:		
Squamous cell carcinoma (SCC)	16	18
Transitional cell carcinoma (TCC)	11	10
Adenocarcinoma (AC)	1	2
Undifferentiated carcinoma (UC)	2	-
*Grading		
I	2	2
II	23	25
III	5	3
*Pathological staging:		
P2	2	3
P3a	13	20
P3b	12	7
P4	3	0

The incidence of bilharziasis and lymph node involvement in both groups are shown in (Table 2), bilharziasis was present in 46 cases (76.7%). Lymph node involvement was in 12 cases (20%).

Table (2): *Frequency of bilharziasis (Bilh) and lymph node involvement (LNI)*

	RC				MRC			
	Bilh	*%*	*LNI*	*%*	*Bilh*	*%*	*LNI*	*%*
Present	24	80	5	20.8	22	73.3	2	9.1
Absent	6	20	3	50	8	26.7	2	25
Total	30	100	8		30	100	4	

Prostatic affection by tumor cells was present in 3 cases of RC group (10%) with one of them also had seminal vesicle involvement (3.3%). It was found that the cases with prostatic involvement had positive lymph nodes with grade II or III and 2 of them were non-bilharzial. The case with seminal vesicle invasion belongs to the bilharzial varity with squamous cell carcinoma grade III and invasion was by direct spread through the bladder wall to the prostate and seminal vesicles. In the non-bilharzial type of prostate affection the pathology was TCC grade III and invasion was not by direct continuity as evidenced by the presence of a free zone between the bladder tumor and that of the prostate which contained tumor cells inside the ducts. Convalescence was uneventful in most patients. The mortality rates were 16.7% and 20% in RC group and MRC one respectively (Table 4)

Table (4): *Post-operative mortality (N=60)*

Cause	*RC*		*MRC*	
	No.	*%*	*No.*	*%*
*Peritonitis	1	3.3	1	3.3
*Heart failure	1	3.3	0	0
*Pulmonary embolism	1	3.3	1	3.3
*Liver failure	1	3.3	1	3.3
*Bronchopneumonia	1	3.3	0	0
*Septic shock	0	0	1	3.3
*Necrosis of ileocaecal segment	0	0	1	3.3
*Secondary haemorrhage	0	0	1	3.3
Total	5	16.7	6	20

The 5-year disease-free actuarial survival was 40% in the MRC group (Fig. 5).

Four patients from RC group and five patients from MRC one, developed complications (Table 5).

Table (5): ***Post-operative morbidity (N=60)***

Type	*RC*		*MRC*	
	No.	%	No.	%
*Wound sepsis	3	10	3	10
*Persistent suprapubic fistula	0	0	2	6.6
*Haematemesis	1	3.3	0	0
Total	4	13.3	5	16.6

The wound sepsis, was controlled by proper antibiotics after culture and sensitivity tests. One patient with suprapubic fistula treated by open surgery after one year, the other cured after two transuretheral resections of the new bladder neck. The case of haematemesis was controlled by injection sclerotherapy of the ruptured oesophageal varices.

Follow-up ranged from 2-5 years, seven cases of RC (28%) and 6 cases of MRC (25%) developed lateral pelvic wall recurrence (Table 6) and most of them died within the first year of follow-up. Local uretheral recurrence occured in one patient in the RC group (4%) and another patient in the MRC one (4.2%). There are two cases with pulmonary metastasis in RC group and two cases (one with pulmonary and one with bony metastasis in the MRC group).

Table (6): ***Recurrence after cystectomy***

	RC		*MRC*	
	No.	%	No.	%
* At the urethra	1	4	1	4.2
* Pelvic wall	7	28	6	25
* Systemic	2	8	2	8.3
* No evidence of disease (NED)	12	48	12	50
* Died of other causes	1	4	1	4.2
* Untraced	2	8	2	8.3
Total	25	100	24	100

Urinary continence by day was achieved in 79.2% of patients (Table 7).

Table (7): *Urinary continence after ileocaecal bladder*

Status	*No.*	*%*
* Diurnal and nocturnal continence	3	12.5
* Diurnal continence and nocturnal incontinence	16	66.7
* Diurnal and nocturnal incontinence	3	12.5
* Untraced	2	8.3
Total	24	100

Nocturnal enuresis was encountered in 79.2%. It is worth noting that complete continence was obtained in all three patients in whom the bladder neck was preserved.

During the first few months after surgery in the MRC group with ICB, most patients had extreme frequency of micturition, i.e. every 10 to 15 min., which improved gradually with perineal exercises. At the end of one year a reasonable rate of voiding was obtained (every 2 hours or more) in 55% (Table 8). Potency after MRC with ICB was 68.2% of the patients (Table 9). Whereas it was 0% in the RC group.

Table (8): *Frequency of micturition one year postoperatively in patients with ileocaecal bladder*

Rate of voiding	*No.*	*%*
* Diurnal and nocturnal incontinence	3	15
* Every half hour	2	10
* Every one hour	4	20
* Every two hours	4	20
* Every four hours	7	35
Total	20	100

Table (9)*: Potency after cystectomy and reconstruction*

Type of cystectomy	*Potent*		*Non Potent*	
	No.	%	No.	%
* RC (n=25)	-	-	25	100
* MRC (n=22)	15	68.2	7	31.8

Urographic studies were done 6 months after the operation and the results were evaluated in the 24 patients (12 in each group) who survived without local recurrence and in whom regular follow-up was achieved (Fig. 3). In 7 of 12 RC patients and 10 of MRC patients, the configuration of the pelvicaliceal system was unchanged or improved compared with the preoperative status. Deterioration was observed in 2 patients with MRC due to the development of stricture at the ureteroileal anastomosis (Table 10).

Table (10)*: Radiological appearance of the renal units after cystectomy*

Type of cystectomy	*Unchanged*		*Improved*		*Deterioration*	
	No.	%	No.	%	No.	%
RC (n=12)	7	58	-	-	5	42
MRC (n=12)	9	75	1	8.3	2	16.7

The capacity of the ileocaecal bladder ranged from 300 to 350 ml. Voiding cystograms were done in 4 patients, none of whom showed vesicoureteric reflux (Fig. 4). Two of the patients who survived for more than 1 year underwent a urodynamic assessment which showed that

they voided by straining.

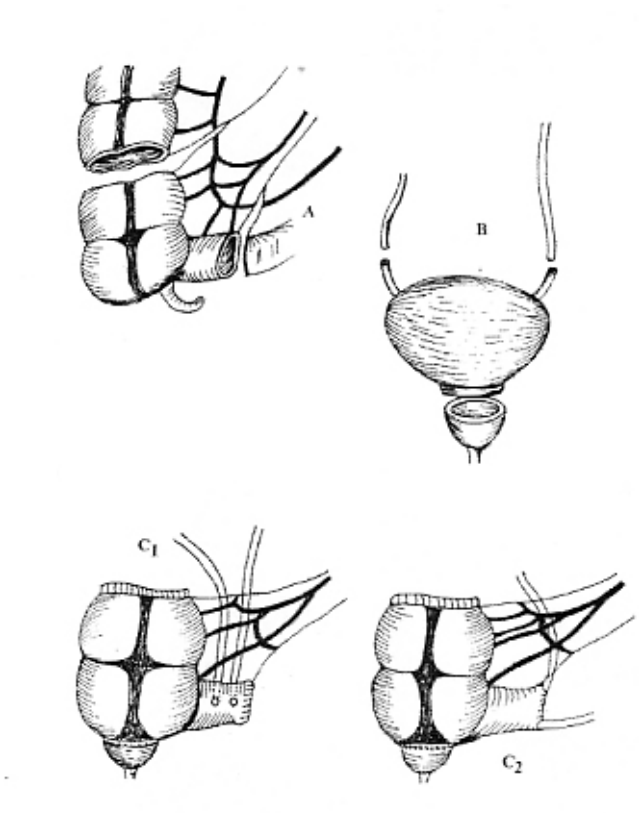

Fig. (1)*: Diagram of ileocaecal bladder reconstruction (A) isolation of the ileocaecal segment. (B) Cystecomy for carcinoma of the urinary bladder. (C1) end to side anastomosis of the ureters to the ileum (C2) end to end anastomosis of the ureters to the ileum.*

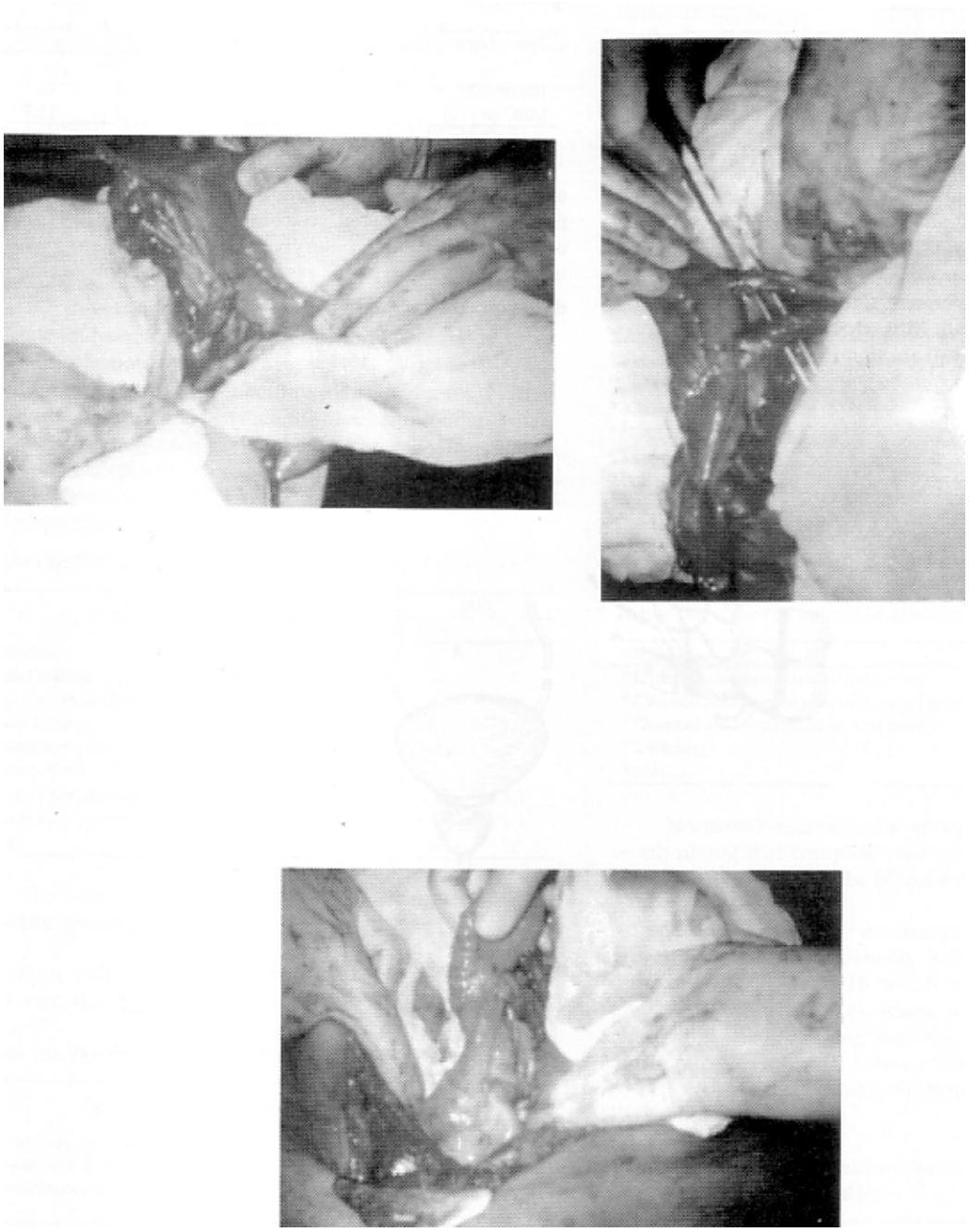

Fig. (2): ***Surgical creation of ileocaecal bladder.***

Fig. (3): ***I.V.U. (A) preoperative; (B): 2 years postoperatively shows improved appearance***

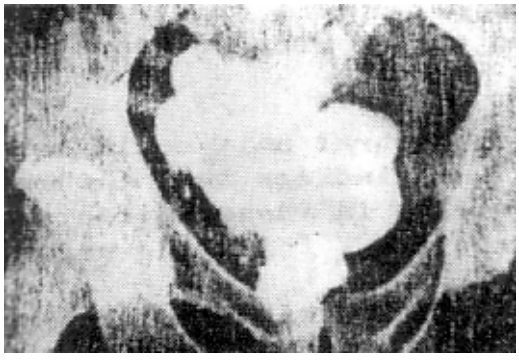

Fig. (4): ***Voiding cystogram of ileocaecal bladder shows absence of reflux.***

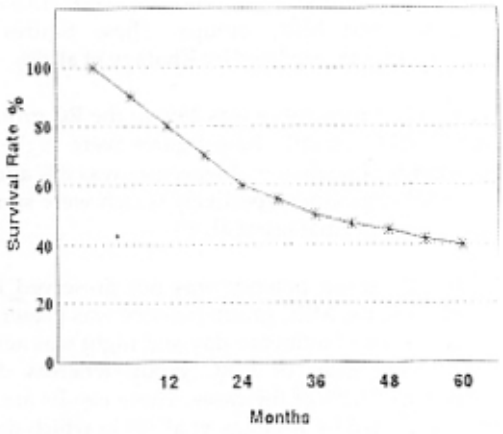

Fig. (5): ***Five-years disease-free actuarial survival (40%) in MRC group***

DISCUSSION

Transyional cell carcinoma constituted 35% of the cases which is higher than the incidence in El-Sebai's series which was 16% [4]. This might be due to the selection of the basal tumors in our series. The distribution of the pathological variants was comparable in the RC and the MRC groups. The incidence of bilharziasis in our series was 80% in the RC group and 73.3% in the MRC group. These figures are lower than those reported by ElSebai 97%, [4].

Prostatic involvement was demonstrated in 10% of cases of RC group. This figure is higher than that reported in other series where it varied between 6-8% [3,4]. But still lower than the western report where it was 18% [5]. Involvement of the seminal vesicle was present in only 3.3%. There is no accurate figure about the exact evidence of seminal vesicle involvement in the literature as they were usually included with prostatic affection [7]. Direct invasion of the prostate and seminal vesicle was detected in only one case. Ro et al. [5] described that prostatic invasion in bladder cancer is either through invasion of the vesical ligaments with retrograde spread to the prostate and seminal vesicles or directly from the infiltrated pelvic cellular tissue.

The mortality rates in the RC group and the MRC group were 16.7% and 20% respectively, which were comparable to the figures in other series for RC with ileal conduit or rectal bladder ranging from 12% to 14% [8,9].

The postoperative complications were 13.3% and 16.6% in RC and MRC groups. These figures were comparable with that reported by Khafagy et al. [10].

Local pelvic recurrence was 28% in the RC group and **25%** in the MRC group. These figures were higher than that reported by El-Sebai, [4]. Metastasis was 8% and 8.3% in RC and MRC group, respectively which were similar to that in the series of Khafagy et al. [11].

In the RC group potency was not preserved in any patient, while in the MRC group potency was preserved in 68.2% of the cases. Continence day and night was achieved in 12.5% of the cases of MRC group whereas diurnal continence was 79.2% of the cases. These results are better than those reported by Khafagy et al. [11] in which day and night continence was achieved in only (6.4%) of cases and day time continence in 75.5%. The reported day time continence by Skinner and Lieskovsky, [12] was 86.6% with non of the patients reporting day and night continence.

The high incidence of day and night continence in our series is due to the preservation of the uretheral musculature with its nerve supply surrounding the prostatic urethera which could maintain high uretheral pressure by night sufficient to balance the peristalitic activity of the intestinal segment used as a bladder substitute.

Persistant diarrhoea due to loss of the ileocaecal valve was not encountered.

Renal function, as judged radiologically, was preserved in most patients 83.3% and we attribute this to the efficiency of the ileocaecal valve in preventing reflux. Postoperative voiding cystograms showed that it regularly prevented reflux. Moreover, a balanced vesico-urethral unit could be achieved as judged by our limited urodynamic studies. Our finding that intra-abdominal pressure is the drive for voiding in these patients is similar to the results reported by Gleason et al. [13], following augmentation cystoplasty and by Goldwasser et al. [14] after continent urinary diversion.

CONCLUSION

ICB reconstruction is an attempt to overcome the inevitable social inconveniences resulting from cystectomy and standard diversion procedures and it is therefore gratifying that all patients were fully satisfied with the continence obtained. Most of them were gainfully employed in the fields as farmers**.**

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