Indian J Surg Oncol (September 2016) 7(3):307–311
DOI 10.1007/s13193-015-0462-4

ORIGINAL ARTICLE

Genital Sparing Cystectomy for Female Bladder Cancer and its Functional Outcome; a Seven Years' Experience with 24 Cases

Sameh Roshdy[1] · Ahmed Senbel[1] · Ashraf Khater[1] · Omar Farouk[1] · Adel Fathi[1] · EmadEldeen Hamed[1] · Adel Denewer[1]

Received: 16 April 2015 / Accepted: 1 September 2015 / Published online: 7 September 2015

Abstract The surgical treatment of bladder cancer is the curative treatment especially in early cases. In this study, our aim was to assess the outcome of preservation of internal genital organs in selected females both oncologically and functionally, and to assess the feasibility of technique and its complication. 24 females with clinically and radiologically diagnosed T2 bladder cancer underwent gynecologic-tract sparing cystectomy (GTSC). Age ranged from 45 to 60 years. Patients with diffuse carcinoma-in-situ, those with tumors involving the bladder neck, those with poor general condition and those with preoperative incontinence were excluded. 1 patient, who developed local recurrence after 6 months. One patient lost follow up after 15 months. No recurrence developed in the retained genital organs. The remaining 20 patients remained free of disease. Among women who were eligible for functional evaluation, Daytime and nighttime continence were satisfactory in 21/22 (95.4 %) and in 20/22 (90.9 %) respectively. Chronic urinary retention, pouch-vaginal fistula was not noted. Most of patients showed superior Sexual Function index. Cystectomy with preservation of the internal genital organs is feasible in female with early, solitary or T2 bladder cancer with satisfactory functional and oncologic outcomes with proper case selection.

Keywords Bladder · Cancer · Cystectomy · Genital · Sparing

✉ Ashraf Khater
dr.ashrafkhater@yahoo.com

Sameh Roshdy
samehroshdy20@gmail.com

Ahmed Senbel
ahmed.sonpol@gmail.com

Omar Farouk
dr_omarfarouk@yahoo.com

Adel Fathi
dr_adel_fathe@hotmail.com

EmadEldeen Hamed
emadhamed81@gmail.com

Adel Denewer
adeldenewer@mans.edu.eg

[1] Unit of Surgical Oncology, Mansoura Oncology Center (OCMU), Faculty of Medicine, Mansoura University, Gomhoria Street, Mansoura 35511, Egypt

Introduction

Radical cystectomy with orthotopic neobladder has become an established treatment for muscle-invasive bladder cancer in females [1]. There is a Considerable interest to preserve the gynecologic tract during cystectomy without affecting the oncologic outcome to maintain the sexual function [2]. Young females with bladder cancer have a desire to preserve the uterus and adnexa for retaining the reproductive function [3]. The oncologic principle of routine removal of the internal genital organs during cystectomy has been questioned. Groutz et al. found only one patient with uterine involvement in examined cystectomy specimens of 37 patients with bladder transitional cell carcinoma [4]. The pathological revision of the resected internal genital organs after anterior pelvic exenteration has revealed that it could be preserved, so the patients might be spared from adverse effects such as acute early menopause, infertility and cessation of the sexual life [5]. More recently, Ali-El-Dein et al. concluded that Genital sparing cystectomy for bladder cancer in selected female patients is feasible; it provides a good functional outcome, better sexual life and a potential for fertility preservation without affecting, the oncologic outcome after a long follow up [6].

Patients and Methods

Our local institutional review board approved this study according to Declaration of Helsinki. Among 160 patients who underwent radical cystectomy at our oncology center for muscle invasive carcinoma of the bladder between January 2007 to May 2014 (90 male and 70 female), a 24 females underwent gynecologic tract sparing cystectomy (GTSC) while the other 46 had an anterior pelvic exenteration. An informed written consent was obtained from all patients. We started the (GTSC) at 2010. Age ranged from 45 to 60 years with a mean age 51 years.

Inclusion Criteria

All patients were T2bN0M0 or less. All patients had a biopsy proven muscle-invasive disease with no evidence of extravesical spread on clinical evaluation and imaging studies including triphasic computed tomography.

Exclusion Criteria

Patients with diffuse carcinoma-in-situ, those with proven extravesical spread or those with tumors involving the bladder neck were excluded. Other exclusion criteria included patients who were preoperatively incontinent or those with poor general condition.

Pre- Operative Preparation

Pre-operative history was taken from all patients including the gynecologic history. Pre-operative clinical examination included general, abdominal, chest, cardiac examination. A thorough pre-operative gynecological assessment was done in all patients. Laboratory investigations were done for patients' fitness. All patients had a serum creatinine of less than 1.8 mg %. Radiological assessment was done with contrast pelvi-abdominal C.T and metastatic work up in the routine way. Finally cystoscopic examination and biopsy were done.

Surgical Procedure (Figs. 1 and 2)

Our technique of gynecologic-tract sparing cystectomy (GTSC) with neo-bladder was based on our experience gained in the performance of radical cystectomy and anterior pelvic exenteration in female patients. Bowel preparation was started at the morning the day before operation. A site for a stoma was marked if it was necessary to create a conduit. The patient was placed in the supine position. An eighteen Folly's catheter was passed and the balloon was inflated to 20 cm^3. A betadine soaked pack was inserted in the vagina. The abdomen was explored through an infra-umbilical midline incision and the transversalis fascia was incised. Bilateral pelvic lymphadenectomy was performed from the common iliac artery bifurcation

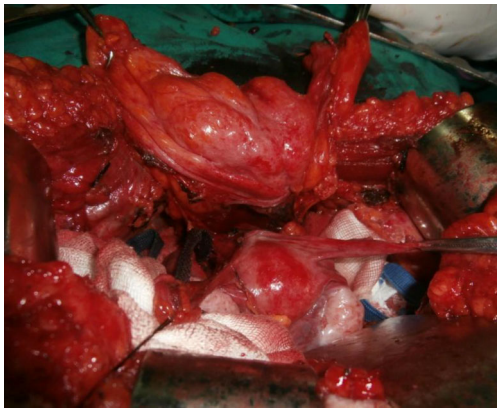

Fig. 1 Dissection between UB, uterus

along the external iliac artery and vein to the femoral canal distally and obturator nerve medially. Then dissection was carried out along the internal iliac artery. The uterine artery was spared with bilateral ligation of the superior vesical artery. The utero vesical peritoneal attachment was divided. The retro pubic space was dissected till the lateral vesical ligaments were divided using the Ligasure or the Harmonic scalpel. Both ureteric ends were divided and sent for frozen section. The urethra was cut 1 cm from the bladder neck with a scalpel and a frozen section was sent from the its distal end. A pre-taken four to six 3–0 Vicryl sutures were put at the urethral end during cutting at 2, 6, 8, 12 ± 4, 10 o'clock with direction out - in and was retained till the neo bladder anastomosis was accomplished. Then the neo bladder was constructed using a segment of the ileum extending 45–60 cm from a point 30 cm proximal to the Ileocecal junction. This segment was isolated with a vascular pedicle constructing a pouch in the form of U, S or W shape). Ureteric anastomosis was done then the pouch was brought to the urethra for urethral anastomosis. The pouch was tested for being water tight before closure. An omental flap was put over the pouch and the anastomotic line (Fig. 2). Post-operatively, the urethral catheter was removed after 6 weeks and patients were advised to start training for controlling micturition. Patient voiding patterns and

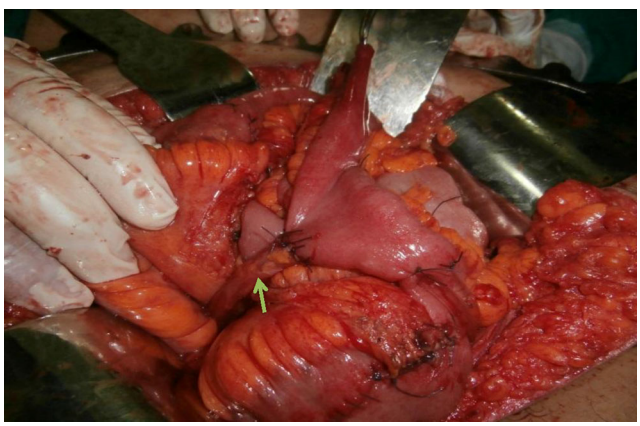

Fig. 2 Pouch creation with arrows pointing to ureteric implantation

continence were assessed by means of a questionnaire and personal interviews as well as a voiding diary. In addition, C.T. urography was used to assess the reflux and incontinence of the patient.

Postoperative Evaluation

The patients follow up program included a 3 months outpatient visits for oncologic and functional evaluation for the 1st post-operative year and 6 months visits after that. The methods of evaluation were as follow; from the functional point of view, patients were asked during the visit about continence (daytime and nighttime). In the case with incontinence, patients were asked about the amount of and frequency during day and night. Also they were inquired whether they can completely evacuate the neobladder. The Continence was determined as the patient feel dryness without the aid of drugs or pads. Also radiologic examination of the patient with urography was done half annually (Fig. 3 and 4). Sexual function was also evaluated. The patients and their husbands were asked about their concurrent relationships with each other and if there are any abnormalities. Also patients were asked about any urinary problems during or after the sexual intercourse, such as urine-leakage, hematuria, dyspareunia or lower abdominal pain.

Results

The Oncologic Outcome

The patient and tumor characteristics are presented in Tables 1 and 2. Definitive histopathology showed transitional cell carcinoma (TCC) in 12 patients (50 %), squamous cell carcinoma (SCC) in 10 patients (41 %) and adenocarcinoma in 2 patients (8.4 %). Definitive histopathology showed surprisingly advanced disease in one case. The postoperative definitive histopathology in this case showed a high stage tumor SCC, (pT3bN1M0) with positive lymphatic metastasis. In this case

Fig. 3 C-T urographic examination showing the pouch with the two ureters

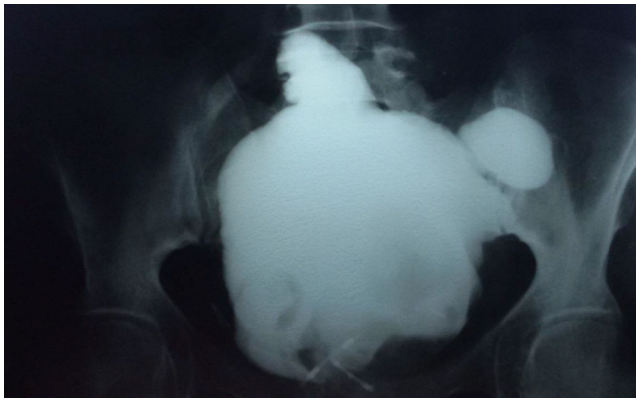

Fig. 4 Conventional urography showing the pouch with the uterus contataining an IUD

the advanced disease was neither recognized by preoperative CT nor recognized intra-operatively. Oncologic failure occurred in this patient in the form of local pelvic recurrence after 9 months although the patient was directed for adjuvant treatment, this patient died 15 months later. Another patient was missed in the follow up after 12 months post-operatively.The remaining 22 patients are still living free of disease with a mean follow-up of 48 months (range 36–58).

Functional Outcome

Twenty two women were evaluated for the functional outcome. Daytime and nighttime continence were satisfactory in 21/22 (95.4 %) and in 20/22 (90.9 %) respectively. Neither chronic urinary retention nor pouch-vaginal fistula was noted

Table 1 Tumor characteristics

	Number	Percentages
Location of the tumor		
▪ Posterior wall	10	41.6 %
▪ Anterior wall	6	25 %
▪ Lateral wall	6	25 %
▪ Dome of the bladder	2	8.4:%
Number of Solitary lesion	24	100 %
Pathological type		
▪ T.C.C	12	50 %
▪ S.C.C	10	41.6 %
▪ Adenocarcinoma	2	8.4 %
Staging(cTNM *)		
▪ T2N0M0	20	83.3 %
▪ T1N0M0	4	16.7 %
Grading of the tumor		
▪ Low grade	1 4	58.3 %
▪ Intermediate grade	6	25 %
▪ High grade	4	16.7 %

*clinical and radiologic TNM staging

Table 2 Patients characteristics

	mean	range
Age	51	45–60
Follow up in months	48	36–58
Body mass index		
• 30–35	20	80.3 %
• Over 35	4	16.6 %
Associated comorbidity		
▪ DM	2	8.33 %
▪ Hypertension	2	8.33 %
▪ Cardiac or pulmonary	0	0

in any patients. We used items of the Index of Female Sexual Function (IFSF) questionnaire. we found accepted lubrication in 20/22 (90.9 %), ability to achieve orgasm in 19/22 (86.4 %), maintained desire in 20/22 (90.9 %),dyspareunia in 3/22 (13.6 %). Vaginal intercourse could be achieved successfully after 6–10 weeks in all patients with acceptable degree of satisfaction for both partners. The functional evaluation of the pouch and reflux was assessed by the use of the conventional urography examination and computed urography examination (Fig. 4) with the result showing 4 patients out of 22 survived patients had a mild degree of the reflux but with normal renal function (18.2 %).

Complications (Table 3)

There were no perioperative deaths. The most frequent early complications were superficial surgical site infections in 4 patients (16.6 %). The other complications were ileal anastomosis leak in 2 patients (8.3 %) and treated conservatively so closure was achieved after10-14 days. There were no late complications. No hydronephrosis, neobladder-ureteral reflux, or deterioration of the renal function was observed in any of patients during the follow-up.

Table 3 Peri-operative data and outcome

	mean	range
Operative time/h	5.02	4–6
Blood loss in ml	681	500–1000
Hospital stay in days	12	10–15
Early postoperative complications		
▪ Local sepsis	4	16.6 %
▪ Hemorrhage	0	0
▪ Wound dehiscence	0	0
▪ Chest infection	2	8.33 %
Continence		
▪ Daytime	21/22	95.4 %
▪ Nighttime	20/22	90.9 %
Index of Female Sexual Function (IFSF)		
▪ Accepted lubrication	20/22	(90.9 %)
▪ Ability to achieve orgasm	19/22	(86.4 %)
▪ Maintained desire	20/22	(90.9 %)
▪ Dyspareunia	3/22	(13.6 %)
▪ Achieved vaginal intercourse	22/22	100 %

Discussion

The main goal of bladder cancer management is to cure the disease with preservation of the normal continence. Achieving an excellent functional response at the expense of compromising cancer cure is not acceptable and it is important to provide patients with the best possible functional outcome, as there is an obvious effect of poor urinary function on the quality of life [7]. The aim of orthotopic bladder reconstruction is to provide a compliant, low pressure continent urinary reservoir that may be emptied completely at socially convenient intervals [3]. Orthotopic neobladder replacement has now been established as an acceptable and desirable type of urinary diversion in a significant percentage of female patients. [8, 9].There is an evidence indicating that in female patients who fulfill the criteria for such procedure, preserving the vaginal wall during cystectomy with subsequent orthotopic neobladder reconstruction significantly decreases the risk of neobladder-vaginal fistula and might improve the functional results [3, 10] In our series, none of the patients developed neobladder-vaginal fistula with maintained plane between the posterior bladder wall and the anterior vagina. Moreover, preserving the gynecologic organs and pubourethral ligament is less likely to result in pelvic descent or prolapse. None of our patients encountered pelvic prolapse during the follow-up. Ali-El-Dein et al. [11] suggested that the pouch descent may lead to angulation of the uretero-intestinal junction with subsequent herniation of the posterior pouch wall (pouchocele) through the anterior vaginal wall. Although it is important to recognize that local recurrence remains a risk, after a median follow-up of 48 months, none of these patients had any recurrence involving the posterior margin at pathologic staging except one case which was mentioned. Our results cope with the results of Takuya Koie et 2010 and Ali-El-Dein et al. 2013 as they restricted selection of their cases [6, 7]. Furthermore, the vaginal vault length is preserved in terms of width and depth, which should contribute to improved functional outcome in patients who are sexually active. In comparison to results obtained by Zippe et al., our results showed a superior sexual satisfaction score parameters (Table 3). Zippe et al. mentioned diminished ability to achieve orgasm in 12/27 patients (45 %), a decreased lubrication in 11/27 patients (41 %), a decreased sexual desire in 10/27 patients (37 %), and dyspareunia in 6/27 patients (22 %). They reported that only 13/27 patients

(48 %) were able to achieve a successful vaginal intercourse [12].

Conclusion

Cystectomy with preservation of the internal genital organs is feasible in female with early, solitary or T2 bladder cancer patients with satisfactory functional and oncologic outcomes with proper case selection.

Acknowledgments Authors are thankful for Dr. Mosab Shetewy for his help all over the work.

Conflict of Interest None of the authors have a financial interest or conflict of interest in the outcome of the research. This study was performed through self-funding.

References

1. Ali-El-Dein B, Abdel-Latif M, Mosbah A, Eraky I, Shaaban AA, Taha NM, et al. (2004) Secondary malignant involvement of gynecologic organs in radical cystectomy specimens in women: is it mandatory to remove these organs routinely? J Urol 172:885–887
2. Kulkarni JN, Jamal Rizvi S, Purushotthama Acharya U, Shiva Kumar KS, Tiwari P (2008) Gynecologic-Tract Sparing Extra Peritoneal Retrograde Radical Cystectomy with Neobladder. International Braz J Urol 34(2):180–190
3. Chang SS, Cole E, Cookson MS, Peterson M, Smith Jr JA (2002) Preservation of the anterior vaginal wall during female radical cystectomy with orthotopic urinary diversion: technique and results. J Urol 168:1442–1445
4. Chang SS, Cole E, Smith Jr JA, Cookson MS (2002) Pathological finding of gynecological organs obtained at female radical cystectomy. J Urol 168:147–149
5. Varkarakis IM, Pinggera G, Antoniou N, Constantinides K, Chrisofos M, Deliveliotis C (2007) Pathological review of internal genitalia after anterior exenteration for bladder cancer in women. Evaluating risk factors for female organ involvement. Int Urol Nephrol; 39:1015–1021
6. Ali-El-Dein B, Mosbah A, Osman Y, El-Tabey N, Abdel-Latif M, Eraky I, Shaaban AA (2013) Preservation of the internal genital organs during radical cystectomy in selected women with bladder cancer: a report on 15 cases with long term follow-up. Eur J Surg Oncol 39(4):358–364
7. Takuya Koie, Shingo Hatakeyama, Takahiro Yoneyama, Yasuhiro Hashimoto, Noritaka Kamimura, and Chikara Ohyama (2010) Uterus-, Fallopian tube-, Ovary-, and vagina-sparing cystectomy followed by u-shaped ileal neobladder construction for female bladder cancer patients: Oncological and functional outcomes urology;75: 1499–1504.
8. Shimogaki H, Okada H, Fujisawa M, et al. (1999) Long-term experience with orthotopic reconstruction of the lower urinary tract in women. J Urol 161:573–577
9. Mills RD, Studer UE. Female orthotopic bladder substitution (2000) : A Good Operation in the Right Circumstances. J Urol.;163:1501–1504.
10. Blute ML, Gburek BM (1998) Continent orthotopic urinary diversion in female patients: early mayo clinic experience. Mayo Clin Proc 73:501–507
11. Ali-El-Dein B, Gomha M, Ghoneim MA (2002) Critical evaluation of the problem of chronic urinary retention after orthotopic bladder substitution in women. J Urol 168:587–592
12. Zippe CD, Raina R, Shah AD, Massanyi EZ, Agarwal A, Ulchaker J, Jones S, Klein E (2004) Female sexual dysfunction after radical cystectomy: a new outcome measure. Urology 63(6):1153–1157