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Functional and Oncological Outcomes of Genital Sparing Cystectomy in Zagazig University Hospitals

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ABSTRACT

Background: Among malignancies affecting the urinary tract, bladder cancer is the most common and continues to pose significant worldwide health concerns. **Objective**: To evaluate the functional and oncological outcomes of genital-sparing cystectomy procedures in male patients with bladder cancer.

Patients and Methodology: This single-center, prospective study included 50 male patients with contended urothelial carcinoma. Cystoscopy/biopsy with a prostatic urethral biopsy if abnormal was assessed. Based on Clavien–Dindo classification, postoperative complications were assessed and maintained functional and quality of life assessments at defined intervals, alongside oncological follow-up, were performed.

Results: The postoperative surgical management included neo-bladder–prostatic re-anastomosis, transurethral resection of the prostate (TURP) with re-anastomosis, and Millin prostatectomy with re-anastomosis. Urinary cytology positivity increased from 0% to 25% in the following 5 years. The ejaculation patterns preoperatively and postoperatively were significantly different: antegrade fell from 90% to 37.5%, retrograde increased; 7.5% reported loss of orgasm, and ART was advised for fertility preservation. Daytime, especially 5 years postoperatively, was slightly incontinent and continue with 5 daytime cases, loss of continence at nighttime significantly worsened. Tumor recurrence increased with follow-up, and was higher with age ≥60, high grade, smoking, and metastasis, while tumor site was not predictive. Late complications included strictures/hydronephrosis, UTIs, stones, neobladder dysfunction continence, retention and oncologic concerns of 5% positive margins plus 45% recurrence at 5 years; sexual complications featured retrograde ejaculation, loss of orgasm, ED, and subfertility. **Conclusion**: Genital-sparing cystectomy, resulted in positive functional outcomes with respect to sexual function, fertility, urinary continence, and quality of life in male patients post-bladder cancer.

Keywords: Genital-sparing cystectomy; Bladder cancer; Functional outcomes; Oncologic outcomes; Sexual function.

INTRODUCTION

Bladder carcinoma represents an abnormal proliferation of urothelium that can be non–muscle-invasive (Ta/T1/CIS) or advance to muscle-invasive and metastatic disease. Risk factors include cigarette smoking, predisposition via occupational exposures (dyes, rubber and leather industries), pelvic radiation, chronic inflammation, and hemostatic disorders. The primary symptom of the disease is painless, intermittent gross hematuria [(1)]. However, dysuria, frequency of urination, and pelvic or flank pain can also occur. Diagnosis is based on the combination of cystoscopy with biopsy/TURBT, urine cytology, and certain urinary biomarkers, in addition to cross-sectional imaging (CT urography or MRI) to evaluate the kidneys and pelvis. In high-risk cases, PET/CT may be used. Most cases are urothelial (transitional cell) carcinoma. The less common variants are squamous carcinoma, adenocarcinoma, and urothelial carcinoma [(2)]. Patients with muscle-invasive disease are usually treated with radical cystectomy or, in some cases, bladder-preserving trimodal therapy with maximal TURBT and chemoradiation with tight monitoring, often following neoadjuvant cisplatin-based chemotherapy [(3)]. In cases of cystectomy, patients may choose between an islanded ileal conduit, an orthotopic neobladder, or a continent cutaneous reservoir causing certain complications, and varying degrees of continence and quality of life. Inflammation and cutaneous neobladder and continent reservoirs may result in post-cystectomy complication [(4)].

For men, genital-sparing cystectomy (also referred to as prostate-sparing or organ-sparing cystectomy) involves a modified radical cystectomy where elements of the prostate, seminal vesicles, vasa deferentia, and the neurovascular bundles are preserved, tailored to maintain postoperative voluntary urination, ejaculation, and erectile function. These procedures are performed on select men, who present with organ-confined (usually ≤cT2) and non-invasive prostatic urethra disease, and with low suspicion for occult prostatic urothelial disease or significant prostate cancer [(5)]. Along with predictors like prostate-specific antigen (PSA) and targeted biopsies of the prostatic urethra and apex, and detailed intraoperative evaluations, the procedures aim to maintain oncologic goals of en-bloc tumor clearance and proper lymphadenectomy, while avoiding excessive dissection that may compromise sphincter or neurovascular structures [(6)].

As a result of the procedural refinements, clinics currently report post cystectomy and orthotopic neobladder patients as offering >90% of the time continence, minor reliance on intermittent catheterization,

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and post-surgical quality of life that patients report as being much better than classic cystectomy [7]. Patients for whom apical prostate tissue, ejaculatory ducts, and cavernous nerves are spared are more likely to retain antegrade ejaculation and experience more spontaneous erections. Early pelvic floor rehabilitation and the use of PDE-5 inhibitors, are helpful adjuncts for promoting erectile recovery. There are, however, many variables, including age and underlying function, to complicate expected outcomes [8,9]. Concerns related to outcomes and on the sexual aspect of a patient's functionality: a major focus of genital-sparing surgery revolves around the fear of unintended compromise of the control of the cancer. This cancer control issue mainly occurs when occult urothelial carcinoma involves the prostatic urethra and when considerable, undiagnosed prostate carcinoma coexists [10].

In organ confined, carefully stage cases, local control and survival outcomes, in the reports, can be comparable to those following a standard cystectomy, but numerous series do have limited and variable follow-ups, and some reviews have hypothesized a potential rise in systemic recurrence risk in cases of poorly defined selection or microscopic screening [11]. While providing an important Quality of Life (QoL) on the assumption that the safety of the cancer is not "bargained" the sexual functionality (including potency and ejaculation in some cases) is preserved much more often than in cases of conventional cystectomy. In this scenario, cautious selection and detailed counseling about the potential gains and adverse outcomes are paramount [12].

Aim of the work was to evaluate the functional and oncological outcomes of genital sparing cystectomy in Zagazig University Hospitals.

PATIENTS AND METHODS

Study Design and Setting

This was a single-center, prospective study undertaken in the Urology Department of Zagazig University Hospitals from December 2018 to December 2023. We selected 50 male patients.

Ethical considerations:

All patients were informed of the operation details and potential complications, and written agreement was obtained from them. The study was approved by the Ethics Committee of the Faculty of Medicine, Zagazig University. The Helsinki Declaration was followed throughout the study's conduct).

Inclusion and exclusion criteria

Inclusion:

Male patients over 18 years with cT2 to cT3a N0 M0 transitional cell carcinoma of the bladder, whether single or multiple, unifocal or multifocal, located away from the bladder neck, trigone, and prostatic urethra, must be continent preoperatively.

Exclusion:

- Serum creatinine exceeding 2 mg/dL,
- Positive surgical margins of the urethra. Simultaneous CIS,
- The patient was unable of executing self-catheterization due to issues with manual dexterity or insufficient help.
- The patient was either unsuited for surgery or declines the procedure. Erectile dysfunction that existed prior.

Preoperative Evaluation

The scope of preoperative evaluation incorporated a detailed history comprising personal history; presenting complaint focusing on hematuria with other lower urinary tract symptoms; surgical and medical comorbidities; family and history of IIEF-5 sexual history; and a focused neurological history. Physical examination included a general examination with Karnofsky status, abdominal examination, digital rectal examination, and a bimanual and genital examination. The preoperative workup included urinalysis, PSA, and a standard preoperative panel (CBC, LFT, RFT, blood glucose, PT/PTT/INR, viral markers), and imaging, which included a pelvi-abdominal ultrasound. Per study protocol, contrast-enhanced CT of the abdomen and pelvis, diffusion-weighted pelvic MRI for lymph-node staging before radical cystectomy, CT chest for metastatic work-up, and bone scan when symptomatic or elevated alkaline phosphatase were also done. Cystoscopy with biopsy documented tumor location/side, size, morph, and number; assessed background urothelium; inspected ureteric orifices for blood efflux; and included prostatic urethral biopsy when the prostatic urethra appeared abnormal. The IIEF-5 score assessed erectile function (5 items each scored 1-5; total 5-25), with a score of 22-25 indicating no erectile dysfunction, 17-21 mild, 12-16 mild to moderate, 8-11 moderate, and 5-7 severe.

Perioperative management and Interventions

The surgeon started with performing bilateral pelvic lymphadenectomy, which was then followed with an incision of the transverse peritoneum between the posterior wall of the bladder and the seminal vesicles/vasa to facilitate optimal exposure. The seminal vesicles, ejaculatory ducts and deferential ampullae were sharply dissected while the neurovascular bundles were preserved. Before separating the bladder from the prostate, the bladder neck was closed to prevent the spillage of tumor. The anterior prostatic capsule was incised and the enucleation plane was developed by the Millin (1945) technique targeting complete adenoma

excision while retaining the important structures, and if benign prostatic enlargement was not present and the plane was unclear, the capsular incision was extended to the apex while preserving the tissue (apex, verumontanum) and seminal vesicles to promote continence and sexual function. The posterior pedicles were cut, the bladder and prostatic adenoma were detached and the frozen specimens of bladder neck and prostatic tissue were utilized to assess and control the margins. After this an orthotopic ileal neobladder was constructed and was anastomosed to the urethra close to the prostatic apex with interrupted sutures promoting optimal function.

Postoperatively, patients were monitored for complications and graded by Clavien–Dindo (I–V). Functional outcomes evaluated included daytime and nighttime continence (achieved with pelvic-floor rehabilitation and medications, if necessary), erectile function assessed by IIEF at 3, 6, 9, and 12 months, and fertility assessed by serial semen analyses (motility, concentration, morphology). Recurrence detection included pre-scheduled imaging (ultrasound/CT/MRI). Surveillance and quality of life monitoring (functional and psychological) included validated questionnaires on quality of life, continence, and sexuality, among others. For recurrence or functional failure management, (including rescinded procedures or further therapy), along with durable cancer control, cost of management was functional autonomy.

Statistical analysis

The historic data, core clinical evaluations, clinical laboratory evaluations, and hierarchy of outcomes data were encoded, and loaded and processed using Microsoft Excel. The data were then exported to the Statistical Package for the Social Sciences (SPSS version 20.0) for execution. Qualitative data were converted into frequencies (number, percentage), whilst quantitative data were summarized using mean ± standard deviation (SD) and range. For comparison of preoperative and postoperative outcome the paired t-test was used. A P-value of less than or equal to 0.05 was considered to be statistically significant.

RESULTS

Table 1 indicates that the mean age was 45±3.1. Concerning smoking behaviors, 24 patients (60%) were smokers. The average BMI was 21.1±3.7 Kg/m².

Table 1: Characteristics of the study population:

Variable	
Age (Years):	
Mean ± SD	45±3.1
Range	40-60
Smoking	
No	16 (40)
Yes	24 (60)
BMI (Kg/m²)	
Mean +- SD	21.1±3.7
Range	18.8-24

Body mass index (BMI)

Figure 1 indicates that 15 patients (37.5%) underwent neobladder prostatic reanastomosis, 15 patients (37.5%) received TURP one week prior together with neobladder prostatic capsule reanastomosis.

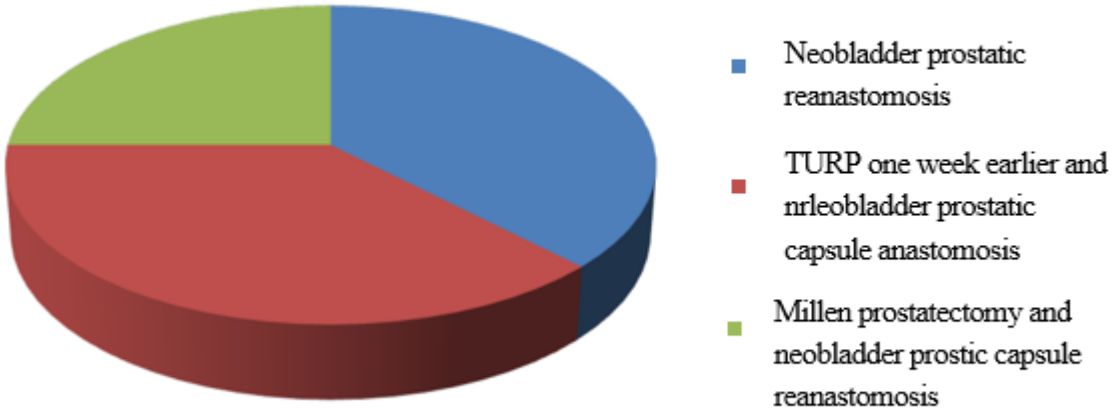

Figure 1: Distribution of cases on different techniques.

Figure 2 indicates that urinary cytology exhibited a gradual rise in positive cases from 0% at 9 months to 25% at 5 years. The chi-square test for trend indicated a statistically significant rising trend (p = 0.0012).

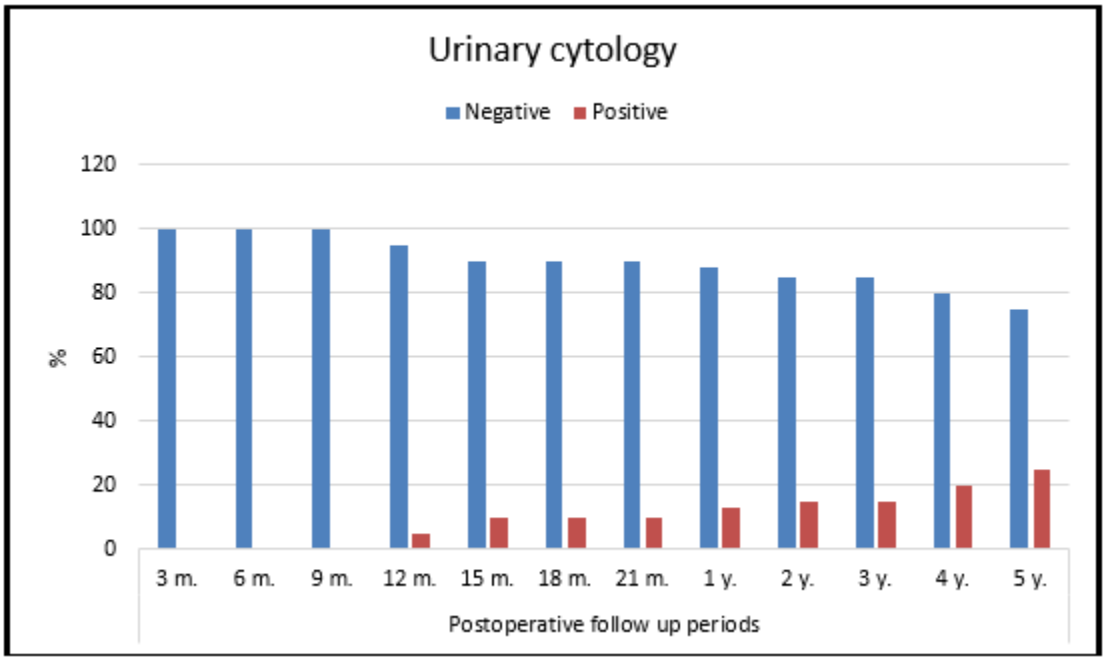

Figure 2: Over time negative and positive urinary cytology cases.

Figure 3 shows that there was statistically significant change of CT study over 5 years.

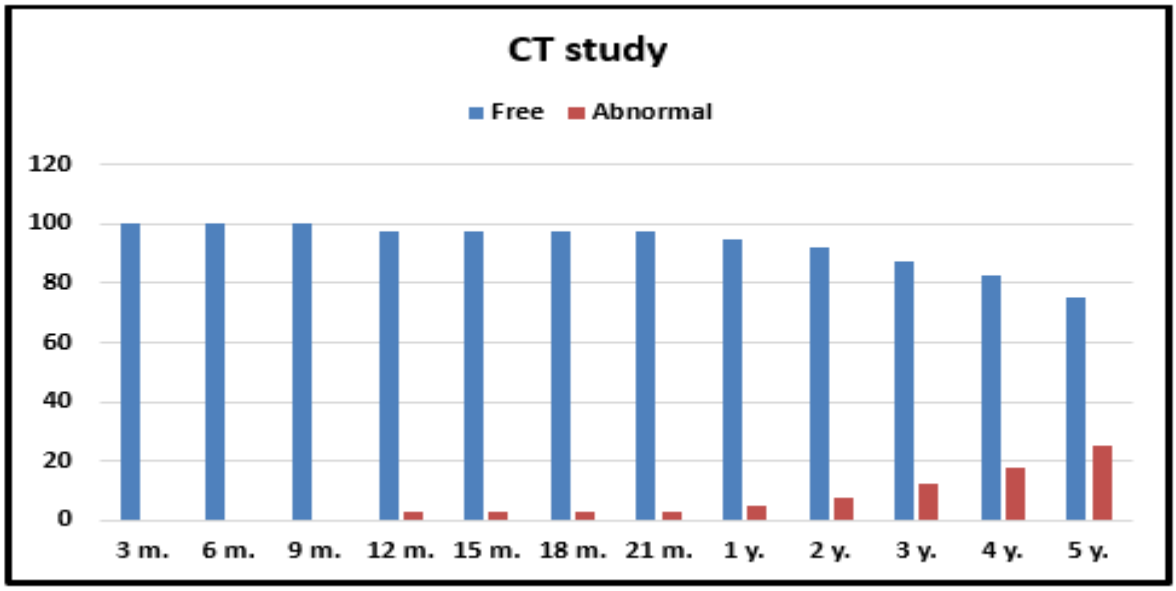

Figure 3: Over five years postoperative CT study of the studied group.

Table 2 indicates that the comparison of pre- and postoperative sexual function ratings (IIEF) revealed no statistically significant variations in any of the assessed domains. Erectile function exhibited minimal variation (26.7 ± 1.5 vs. 26.9 ± 1.1), as did orgasmic function (9.6 ± 1.0 vs. 9.8 ± 0.1). There were no significant differences in sexual desire levels, intercourse satisfaction, and overall satisfaction.

Table 2: Pre- and postoperative international index of erectile function (IIEF) score of patients:

Variable	Preoperative	Postoperative	Paired T test	
Erectile function			t	P value
Mean ± SD	27.2 ± 1.5	26.9 ± 1.1	0.580	0.560
Range	15-28	15-28		
Orgasmic Function				
Mean ± SD	9.6 ± 1.0	9.2±0.1	0.450	0.650
Range	6-10	6-10		
Sexual Desire:				
Mean ± SD	8.2 ± 1.1	8.0±0.9	0.620	0.540
Range	5-10	6-10		
Intercourse Satisfaction:				
Mean ± SD	12.3 ± 2.0	12.0±2.0	0.780	0.440
Range	9-15	10-15		
Overall Satisfaction:				
Mean ± SD	9.5 ± 0.9	9.1±0.1	0.980	0.330
Range	7-10	8-10		

Figure 4 demonstrates a statistically significant alteration in seminal analysis before and after surgery. Postoperatively, 15 patients (37.5%) experienced antegrade ejaculation, whereas 25 patients (62.5%) experienced retrograde ejaculation. Patients requiring preservation of fertility were recommended to pursue assisted reproductive technologies (ARTs).

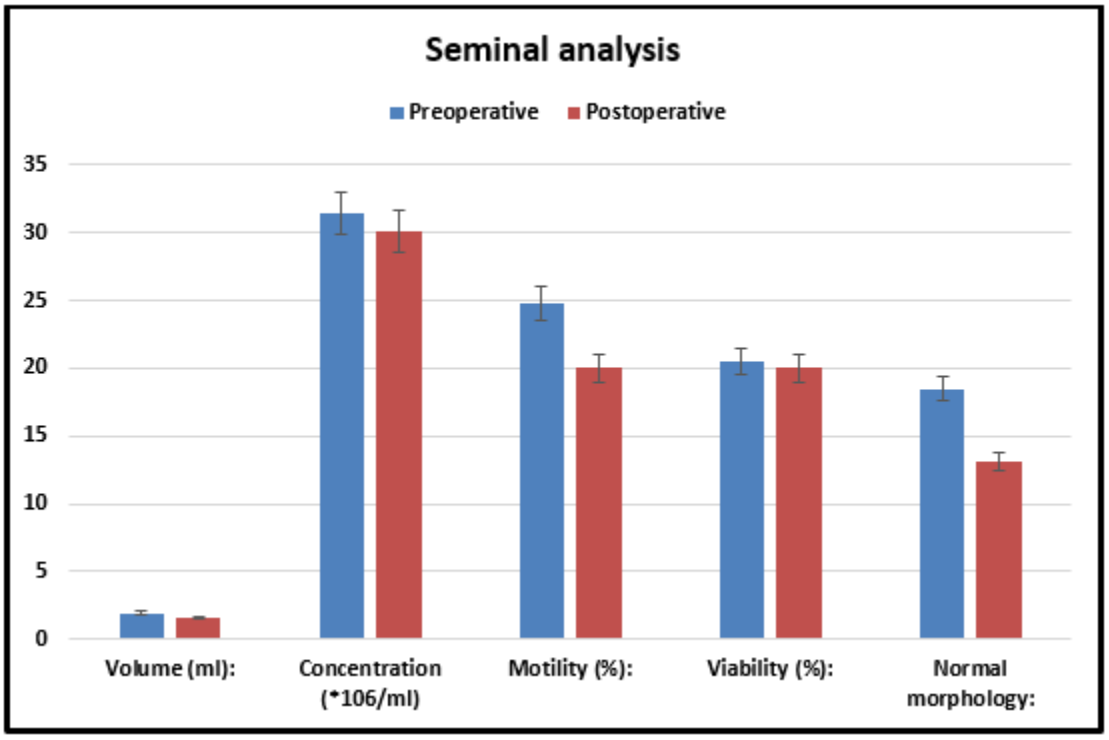

Figure 4: Pre- and postoperative seminal analysis of patients.

Table 3 and figure 5 indicate that there was no statistically significant alteration in daytime continence over time. Thirty individuals emptied using the Crede maneuver, while ten patients voided normally. Two patients who received transurethral resection of bladder (TURB) and two patients who underwent direct neo-bladder prostatic anastomosis experienced incontinence within two years. At five years, five occurrences of daytime incontinence were reported.

Table 3: Over five years postoperative day time continence of the studied group:

Postoperative follow up periods	Day time continence				Chi-square test for trend	
	Continent		Incontinent		χ^2	P value
	N	%	N	%		
3 months postop.	37	92.5	3	7.5	1.425	0.234
6 months postop.	37	92.5	3	7.5		
9 months postop.	37	92.5	3	7.5		
12 months postop.	36	90	4	10		
15 months postop.	36	90	4	10		
18 months postop.	36	90	4	10		
21 months postop.	36	90	4	10		
1 years postop.	36	90	4	10		
2 years postop.	36	90	4	10		
3 years postop.	35	87.5	5	12.5		
4 years postop.	35	87.5	5	12.5		
5 years postop.	35	87.5	5	12.5		

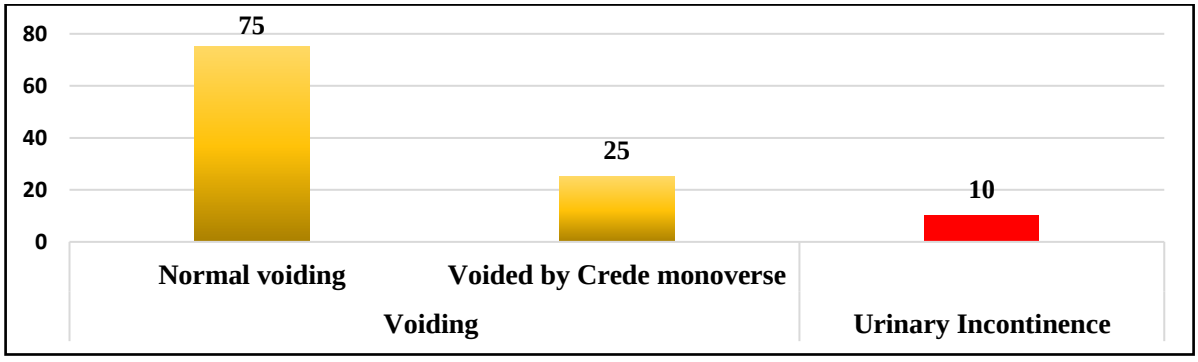

Figure 5: Postoperative outcomes for these urinary conditions in the studied group

Table 4 shows that there was statistically significant change of night time continence over time.

Table 4: Over five years postoperative night time continence of the studied group:

Postoperative follow up periods	Night time continence				Chi-square test for trend	
	Continent		Incontinent		χ^2	P value
	N	%	N	%		
3 months postop.	25	62.5	15	37.5	7.220	**0.007**
6 months postop.	25	62.5	15	37.5		
9 months postop.	25	62.5	15	37.5		
12 months postop.	24	60	16	40		
15 months postop.	24	60	16	40		
18 months postop.	24	60	16	40		
21 months postop.	24	60	16	40		
1 years postop.	19	47.5	21	52.5		
2 years postop.	19	47.5	21	52.5		
3 years postop.	19	47.5	21	52.5		
4 years postop.	19	47.5	21	52.5		
5 years postop.	19	47.5	21	52.5		

Figure 6 shows that tumor recurrence increased progressively with longer follow-up duration. At 1 year, 5 patients (12.5%) had recurrence, rising to 7 patients (17.5%) by 2 years. The rate continued to climb over time, reaching ultimately 18 patients (45%) at 5 years.

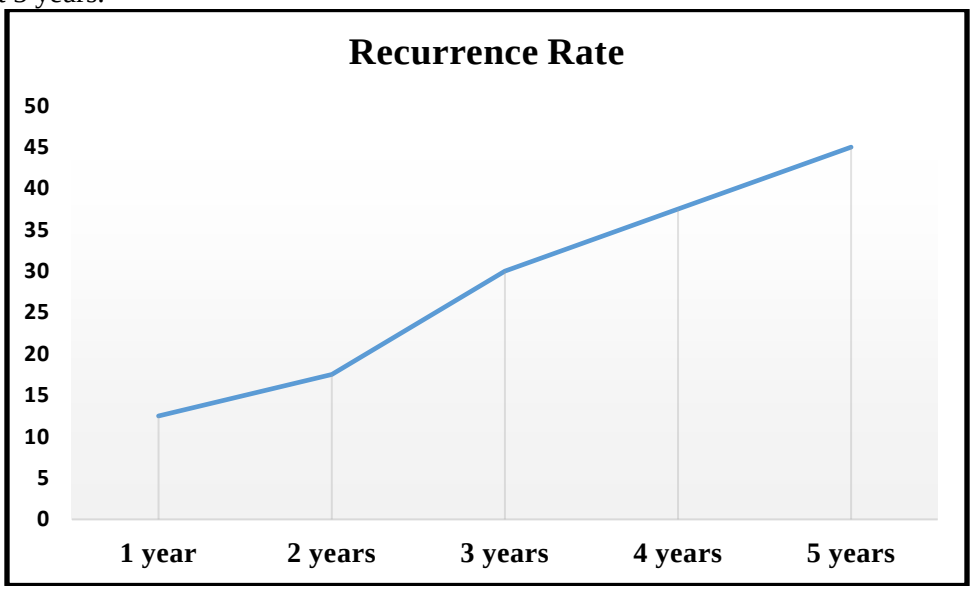

Figure 6: Recurrence rate among the studied group.

As demonstrated in table 5, patients < 60 exhibited a recurrence rate of 62.5%, which was significantly higher than those aged ≥60, whose recurrence rate was 18.8%. Tumor grade showed the strongest association with recurrence, with 77.8% of high-grade tumors recurred while 18.2% of low-grade tumors recurred. Other predictors also appear significant, notably smoking, with recurrences of 62.5% in smokers compared with 18.8% in non-smokers. Presence of metastases was highly significant, with recurrences of 83.3% in patients with metastases and 17.9% in patients without. Tumor site had no significant association with recurrence.

Table 5: Relation between postoperative recurrence with different demographic, clinical and tumor characteristics:

			Recurrence		**Non-Recurrence**		**Chi-square Test**	
		Number of Patients	**N**	**%**	**N**	**%**	χ^2	**p-value**
Age	<60 years	16	3	18.8	13	81.3	7.42	**0.006**
	≥60 years	24	15	62.5	9	37.5		
Grade	Low grade (I)	22	4	18.2	18	81.8	14.21	**<0.001**
	High grade (II and III)	18	14	77.8	4	22.2		
Smoking	Non-smoker	16	3	18.8	13	81.3	7.42	**0.006**
	Smoker	24	15	62.5	9	37.5		
Tumor Site	Bladder Dome	14	6	42.9	8	57.1	0.04	0.841
	Other Sites	26	12	46.2	14	53.8		
Metastasis	Absent	28	5	17.9	23	82.1	17.02	**<0.001**
	Present	12	10	83.3	2	16.7		

Table 6 presents reported postoperative problems. General surgical complications comprised ileus (5%), and thromboembolism (5%). A minority of individuals experienced urinary problems, including pelvic urinoma (5%). Bowel-related problems included bowel leakage (5%) and prolonged ileus (5%).

Subsequent complications encompassed urinary problems including recurrent urinary tract infections (7.5%), stone formation (5%), and neobladder dysfunction such as retention with overflow incontinence (5%). Oncological consequences exhibited a recurrence rate of 12.5% within one year and 45% after five years, with positive surgical margins observed in 5% of cases. Sexual problems were significant, with retrograde ejaculation occurring in 62.5% and loss of orgasm in 12.5%.

Table 6: Postoperative complications of the studied cases

	No.	%
A. Early complications		
General surgical complications		
Hemorrhage	1	2.5
Wound infection	1	2.5
Pelvic abscess	1	2.5
Ileus	2	5.0
Thrombo-embolism	2	5.0
Urinary complications		
Urethro-neobladder leakage	1	2.5
Uretero-enteric leakage	1	2.5
Pelvic urinoma	2	5.0
Bowel related complications		
Bowel leakage	2	5.0
Intestinal obstruction	1	2.5
Prolonged ileus	2	5.0
B. Late complications		
Urinary complications		
Stricture	1	2.5
Hydronephrosis	1	2.5
Recurrent UTI	3	7.5
Stone formation	2	5.0
Neobladder dysfunction		
• **Incontinence**	5	12.5
• **Retention**	2	5.0
Oncological complications		
Recurrence within 1 year	5	12.5
Recurrence within 5 years	18	45
Sexual complications		
Erectile dysfunction	1	2.5
Lost orgasm	5	12.5
Subfertility	3	7.5

DISCUSSION

Bladder cancer is one of the most common types of cancer all over the world. There are an estimated 550,000 new cases and 200,000 deaths due to the disease each year. This cancer primarily affects older individuals, and it is more common in males than in females. The cancer is predominantly diagnosed in earlier stages, but about 25% of patients present with muscle invasive bladder cancer (MIBC) [13].

Radical cystectomy (RC) is considered the best treatment option for muscle invasive bladder cancer (MIBC) and offers a chance of cure and improved survival. This is because the surgery removes the bladder along with the surrounding lymph nodes and other structures, the prostate and seminal vesicles in males or the reproductive organs in females, for total pelvic exenteration. While cystectomy is associated with excellent cancer control, it is associated with negative functional outcomes, which include the loss of sexual function, loss of urinary control, and loss of childbearing potential, which are devastating for younger and sexually active patients [14].

GSC is primarily aimed at allowing patients to retain sexual function, urinary control, and in some cases, the ability to have children, which are the most commonly lost functional gains after radical cystectomy. There is considerable interest in GSC for younger patients, those with localized disease, and patients who wish to retain their ability to have children [2].

Preserving men's prostates and seminal vesicles allows them to retain both erectile ability and the potential for reproduction. Studies suggest that erectile ability remains functional for a substantial number of individuals after a prostate-sparing cystectomy, although the risk of retrograde ejaculation, which may impact fertility, remains [15].

Younger individuals may be especially concerned regarding the psychosocial issues of survival and the quality of life, relationships, and sexual reproduction that younger individuals want. The ability to retrograde ejaculate may be addressed through modern assisted reproductive technologies (ARTs) that involve sperm banking and in vitro fertilization (IVF). The effects of post-GSC ARTs on reproductive outcomes and success rates remain to be explored [16].

Concerns regarding the oncological safety of GSC remain despite these benefits. The anatomical and functional preservation of the prostate and seminal vesicles may allow undetected microscopic disease to remain in these tissues, raising the risk of inadequate cancer control and recurrence or metastasis [17].

The current study aimed to examine how patients with bladder cancer who underwent genital-sparing cystectomy fared in terms of functional and oncologic outcomes, particularly with respect to urinary continence, subjective quality of life, sexual function, and cancer control as compared to more radical surgical approaches.

The demographic data conform to the norm as identified within the literature. **Habous *et al.*** [18] reported median ages of the cohort as 56 years with a considerably higher BMI of 30 kg/m^2. In contrast, our population was younger and had a lower BMI. Our investigation indicated patients' average age was 45 ± 3 years. In the same way, with respect to older patient demographic **Gentile *et al.*** [19] reported mean age of 60.7 years. Younger age and lesser BMI may positively influence functional recovery post-surgery, as younger patients tend to recover more rapidly.

With respect to the surgical procedures, we performed GCS, which is within the range of commonly practiced surgical approaches, albeit with **Habous *et al.*** [18] diverging slightly wherein a higher portion (66.2%) of patients underwent Millin prostatectomy.

This agrees with **Hernandez *et al.*** [20] who noted similarly, with respect to bladder cancer patients, the recurrence rates tend to rise with time. **De Vries *et al.*** [21] described parity of the metastatic recurrence rates with respect to prostate-sparing and radical cystectomy and our findings differ wherein we observed much higher recurrence rates in the metastatic patients.

Basiri *et al.* [11] showed elevated rates of local recurrence (61% compared to 55%), with no statistically significant differences between the groups. The elevated recurrence rate observed in both groups in this investigation, in contrast to other studies, may indicate clinical heterogeneity due to variations in patient and disease features.

Other studies documenting metastatic recurrence were case series indicating rates of 0% for the nerve-sparing approach [9] and 5% to 33% for prostate or capsule-sparing techniques [22]. Concerns have arisen that oncological outcomes may be jeopardized by sparing procedures, which could elevate the likelihood of atypical extensive metastases [23].

Nyame *et al.* [24] mentioned that no local recurrences occurred in their cohort on prostate apex-preserving; however, there was one nodal recurrence at 31 months, which was subsequently treated with chemotherapy.

In contrast, **Pacchetti *et al.*** [25] has noted an increase in distant metastases, which underscores the limits of RARC when no systemic therapy is available in the treatment of advanced disease.

In this study, the predictors of recurrence included age, tumor grade, smoking, and metastasis. The population of patients aged 60 years and above had a recurrence rate of 62.5%, while those younger than this had a rate of 18.8%. Recurrence was significantly associated with high-grade tumors, as the high-grade

tumor group had a recurrence rate of 77.8%, while the low-grade tumors only had 18.2%.

These findings corroborate the work of **Basiri *et al.*** [11] and **De Vries *et al.*** [21], both of whom similarly documented that older age and high-grade malignant tumors were predictors of significantly higher recurrence. The influence of smoking in relapse that we documented was also noted by **Hernandez *et al.*** [20] and **De Vries *et al.*** [21]. Recurrence rates in this cohort of smokers was 62.5% as compared to 18.8% in nonsmokers.

Administration of the International Index of Erectile Function (IIEF) preoperatively and postoperatively to patients demonstrated that there were no meaningful alterations in the sexual function of patients.

Regarding erectile function and orgasmic function, as well as sexual desire, enjoyment of intercourse, satisfaction, and sexual cohesion, these factors were unchanged after the surgery. Because of the changes in the semen parameters, one notable difference was in ejaculation. Antegrade ejaculation dropped from 90% preoperatively to 37.5% postoperatively, and retrograde ejaculation increased from 10% to 62.5%.

With regard to erectile function, **Colombo *et al.*** [8] reported that the condition of all patients was unchanged. Also, all patients reported enjoyment of sexual intercourse 1 to 2 months after the operation. 29.6% of patients had urine obtained after masturbation that contained a significant volume of spermatozoa (mean 8 million).

The increase in retrograde ejaculation corresponds with the results of **Mertens *et al.*** [26]. **Colombo *et al.*** [8] similarly reported that retrograde ejaculation increased after prostate-sparing cystectomy from 10% to 62.5%.

With regard to urinary continence, 75% of patients were documented to have day time continence, and that figure remained the same over the period of time assessed. 5 years on, only 55% of patients achieved overnight continence, while the other 45% had continence with overflow incontinence and a significant delay in recovery of overnight continence compared to daytime continence.

To further support our findings, **Hernandez *et al.*** [20] brought attention to the absence of substantial differences regarding continence results between standard and prostate-sparing cystectomy, further supporting our interpretation that the continence results of prostate-sparing approaches are only slightly different, with recovery of urinary control likely taking longer, particularly for nighttime continence.

In the study conducted by **Colombo *et al.*** [8], it was recorded that 18 (67%) of 27 patients achieved both diurnal and nocturnal urinary continence immediately following the removal of the indwelling catheter, whereas the remaining 9 (33%) patients achieved the 15-days post catheter removal. Evaluations performed at the 3 and 12 month intervals confirmed total urinary continence in all patients.

In our study population, postoperative complications were quite infrequent. Documented complications included 2.5% for hemorrhage, wound infection, and pelvic abscess, 5% for ileus and thromboembolism. Urinary complications were infrequent and included 2.5% for urethro-neobladder and 2.5% uretero-enteric leaky. Bowel complications were also noted in small numbers: 5% for bowel leaky and 2.5% intestinal obstruction.

Perioperative deaths were not present according to **Roshdy *et al.*** [27]. Initially, there were minor superficial surgical site infections in four patients (16.6%). Two patients (8.3%) sustained conservatively treated ileal anastomosis leaks that resolved within 10-14 days. During follow-up, none of the patients were reported to have late complications such as hydronephrosis, neobladder-ureteral reflux, or loss of renal function.

Delayed sequelae included urinary stricture and hydronephrosis (2.5% each), recurrent urinary tract infections (7.5%), stone formation (5%), and neobladder dysfunction, which comprised incontinence (12.5%) or retention (5%) and were classified as dysfunction of the neobladder and hydronephrosis.

Sexual dysfunction was particularly common in our cohort, as **Mertens *et al.*** [26] reported. Retrograde ejaculation was identified in 62.5% of patients, orgasmic loss in 12.5%, erectile dysfunction in 2.5%, and subfertility in 7.5%. These results coincide also with the findings of **Colombo *et al.*** [8] who described similar sexual function difficulties after the prostate-sparing cystectomy as those described by **He *et al.*** [16].

Our study confirms that functional outcomes, especially with regards to erectile function and daytime continence, continue to be favorable with genital-sparing cystectomy. However, concerning nighttime continence and preservation of fertility, specifically with high rates of retrograde ejaculation, issues remain. The increase in recurrence rates within our population, especially within older patients, those with high-grade malignancies, and smokers, suggests careful selection of patients is paramount. This coincides with **De Vries *et al.*** [21] and **Jonsson *et al.*** [28] regarding the long-term oncological outcomes of prostate-sparing techniques that may require further investigation; our study shows a more pronounced increase in recurrence rates over the study period. This indicates a possible need for improvement in selection of patients, surgical methods, and consistent postoperative care in order to improve the functional and oncological outcomes in this population.

CONCLUSION

According to our findings, genital-sparing cystectomy holds functional outcomes positively, keeping

sexual function, fertility, urine continence, and quality of life in males with bladder cancer. Even though there was a statistically significant reduction in antegrade ejaculation and an increase in retrograde ejaculation in a postoperative period, the overall impact on erectile function, orgasmic function, and sexual pleasure was minimal. The urinary continence, both diurnal and nocturnal, demonstrated stable or slightly diminished rates over time with most patients maintaining some bladder control, particularly during the day.

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