

## ORIGINAL RESEARCH—ONCOLOGY

## Outcomes for Organ-Preserving Surgery for Penile Cancer

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## ABSTRACT

**Aim.** Squamous cell carcinoma of the penis (PC) has traditionally been treated with partial penectomy with a 2-cm margin. More conservative resection margins have been reported to have no effect on oncologic control, but there is no consensus in the literature regarding functional outcomes after organ-preserving surgery for PC.

**Methods.** Six patients meeting inclusion criteria were retrospectively identified to have received organ-sparing surgery for PC at the Cleveland Clinic from 2003 to 2012. Patient's sexual and urinary quality of life was assessed retrospectively using the International Index of Erectile Function and the patient-reported outcome measure for urethral stricture surgery.

**Results.** Three patients (50%) report normal erections but describe intercourse as not very enjoyable and report being dissatisfied with their sex life. The remaining 50% consistently report no sexual activity and denied feeling sexual desire. All report only mild urinary symptoms, including decreased stream (18%) and feelings of incomplete voiding (67%). Eighty-three percent of patients report their sexual symptoms do not interfere with their daily lives. One hundred percent report being satisfied with their procedure.

**Conclusion.** Our study is the first to use standardized, validated questionnaires to evaluate sexual and urinary function in a North American penile cancer patient population. We report excellent overall urinary function and quality of life following penile-sparing surgery for PC, and our results depict more realistic sexual outcomes than those reported in studies using non-blinded and non-validated methods. **Scarberry K, Angermeier KW, Montague D, Campbell S, and Wood HM. Outcomes for organ-preserving surgery for penile cancer. Sex Med 2015;3:62–66.**

**Key Words.** Organ-Preserving Surgery; Penile Cancer; Outcomes

## Introduction

Squamous cell carcinoma of the penis (PC) is a rare cancer with an incidence of <1 in 100,000 men in North America and Europe [1]. Local control of invasive PC has traditionally been achieved with partial penectomy with a 2-cm

margin, but recent literature shows more conservative resection margins have no effect on long-term oncologic control with the potential to further preserve acceptable sexual and urinary function [2–4]. While various studies have reported on functional outcomes after organ-preserving surgeries including glansctomy (removal of the glans) or distal

corporectomy (removal of glans and <2-cm margin of distal corpora cavernosa), few have utilized a validated questionnaire to assess postoperative outcomes. Our objective was to investigate patient satisfaction with their sexual and urinary outcomes following organ-preserving surgery, including glansectomy or distal corporectomy, for carcinoma of the penis.

### Patients

Fifty living patients were retrospectively identified by searching hospital billing codes for procedures “penectomy” or “partial penectomy” performed between 2003 and 2012 at the Cleveland Clinic Glickman Urological Institute. Upon chart review, 25 patients were excluded as they had undergone surgery for a diagnosis other than PC. Ten required complete penectomy and were excluded from the study. Eight patients were lost to follow-up or unable to be contacted, and one refused participation in the study. All six remaining patients were confirmed to have undergone penile-sparing surgery on chart review, reported their general health as good or very good, and were included in the study.

### Methods

Approval was obtained by the Cleveland Clinic Institutional Review Board, and consent was obtained via telephone. Patients were asked to complete two questionnaires addressing their health and quality of life (QOL) and return the results by mail. The International Index of Erectile Function (IIEF-15) was utilized as a validated questionnaire to assess erectile function and satisfaction with sexual activity, and results were used to calculate a specific score for each patient regarding each of the four domains of sexual function represented on the IIEF [5].

The patient-reported outcome measure (PROM) for urethral stricture surgery, as reported by Jackson et al., was utilized as a validated questionnaire to quantify changes in voiding symptoms and health-related QOL following penile surgery [6]. The survey included 22 questions addressing urinary symptoms, sexual function, and perceptions of overall health and satisfaction with the operation.

Sociodemographic data and operation details were obtained through chart review and were codified and arranged in tables with questionnaire

results. Patients were provided with a \$25 Amazon .com gift card as compensation.

### Results

Six patients completed questionnaires. The mean (range) follow-up period from initial surgery to present investigation was  $52 \pm 16$  (25–84) months, and the mean (range) current age is  $67 \pm 10$  (56–87) years old.

Two patients had undergone a glansectomy and glanuloplasty with split-thickness skin flap for coverage of the tips of the corporal bodies. Four patients required proximal dissection and distal corporectomy, with incision lines at 3, 5, 8, and 10 mm proximal to the coronal sulcus, respectively. Operations were performed by three surgeons. Squamous cell carcinoma with negative surgical margins was confirmed on final pathology for all cases. Four patients required radical or modified inguinal lymphadenectomy.

#### Sexual Function (Tables 1 and 2)

Three patients (50%) reported erections with normal rigidity. All three report low or moderate sexual desire. Two (33%) reported sexual activity with successful penetration, orgasm, and ejaculation at least a few times. Both of these patients report dissatisfaction overall with respect to sexual QOL.

The remaining three patients consistently report no sexual activity or attempts at intercourse with severely or moderately reduced rigidity of erections and no sexual desire.

Five (83%) patients report their sexual symptoms do not at all interfere with their daily lives.

#### Urinary Function (Table 3)

No patients report any episodes of cystitis. Four (67%) report normal strength of urinary stream, with only one reporting a consistent reduction in strength. Three (50%) report occasional wetness in their pants a few minutes after urinating. Four patients report occasionally feeling they have not fully emptied their bladder after urinary.

Five (83%) patients report their urinary symptoms do not at all interfere with their daily lives.

#### Satisfaction

All patients report their overall health as being “good” or “very good” and report being “satisfied” or “very satisfied” with the outcome of their procedure.

**Table 1** Representative questions on sexual function from IIEF and PROM questionnaires

Patient	Age	Operation	Able to obtain erection with sexual activity		Rigidity of erection		Able to penetrate		Able to ejaculate		Satisfaction with intercourse		Sexual desire rating		Sexual symptoms interfere with daily life	
			Glansectomy only	Distal corporectomy	Almost always or always	Almost never(1) or no sexual activity (2)	Normal	Moderate (1) or severe (2) reduction	A few times never (2) or almost never (2)	No sexual activity	A few times	No sexual activity	Not very enjoyable	No sexual activity	Moderate or low (2)	Very low or none
1	56		X	X	X		X	X	X	X	X	X	X (1)		X	
2	61		X	X	X		X (2)	X	X	X	X	X	X (2)		X	
3	64		X	X	X		X (1)	X	X	X	X	X	X (1)		X	
4	87	X		X		X (2)		X	X	X	X	X		X		
5	67	X		X		X (2)	X (1)	X	X	X	X	X		X		
6	72	X		X		X (2)	X (2)	X	X	X	X	X		X		

Patient-reported sexual function following penile-preserving surgery for PC

**Table 2** Scoring data for the four domains of sexual function from the IIEF

Patient	Age	Operation	IIEF-15 score per domains (score range)				Overall satisfaction (2-10)
			Distal corporectomy	Erectile function (1-30)	Orgasmic function (1-10)	Sexual desire (2-10)	
1	56		X	5	1	6	7
2	61		X	14	6	4	4
3	64		X	22	3	7	2
4	87	X		1	1	2	2
5	67	X	X	1	1	2	2
6	72	X		1	1	2	2
Mean	67			7.3	2.1	3.8	3.1

Patient-reported sexual function following penile-preserving surgery for PC

**Table 3** Patient-reported urinary function following penile-preserving surgery for PC

Patient	Age	Operation		Strength of stream		Straining to urinate		Stream stops and starts		Do not fully empty bladder		Wetting of underwear after urination		Urinary symptoms interfere with daily life
		Glansectomy only	Distal corporectomy	Normal	Occasionally (1) or always (2) reduced	Never	Occasionally (1) or sometimes (2) reduced	Never	Occasionally (1) or sometimes (2)	Never	Occasionally (1) or sometimes (2)	Never	Occasionally (1) or sometimes (2)	
1	56	X	X	X	X (2)	X	X (1)	X	X (1)	X	X (1)	X	X	
2	61	X	X	X	X	X	X	X	X	X	X (1)	X	X	
3	64	X	X	X	X (1)	X	X (2)	X	X	X	X (1)	X	X	
4	87	X	X	X	X (1)	X	X	X	X (1)	X	X (1)	X	X	X
5	67	X	X	X	X (1)	X	X	X	X (1)	X	X (1)	X	X	
6	72	X	X	X	X (2)	X	X	X	X (1)	X	X (1)	X	X	

Results include select questions from PROM for urethral stricture surgery questionnaire

**Discussion**

Penile cancer is most common in Asian, African, and South American countries where it accounts for up to 10% of cancers in men [1]. Poor hygiene is a risk factor most commonly associated with penile carcinoma, and high rates of early male circumcision likely explain low rates of PC in the United States. The infrequency with which PC is seen in Western, circumcised males has made it difficult to acquire data for studies addressing basic questions patients may have regarding postoperative sexual and urinary outcomes. Our study is the first to use standardized, validated questionnaires to evaluate sexual and urinary function in a U.S. patient population [7]. Patients were overall receptive to both the IIEF and PROM for urethral stricture questionnaires, with six patients matching study criteria consenting to the study and completing both questionnaires.

Maintenance of adequate sexual function is a very common concern for men undergoing treatment for penile cancer. It has been previously shown that seven of 25 men treated for penile cancer by various methods reported that, if asked again, they would choose a treatment with lower long-term survival to increase the chance of remaining sexually potent [8].

Historically, the goal of treatment for penile carcinoma is complete excision with adequate margins, and organ-sparing surgical options such as those described in this study have great potential for allowing men with PC to retain sexual potency. Other conservative treatment modalities including radiotherapy, Mohs micrographic surgery, and laser therapy are increasingly being used. Initial studies have shown these modalities to have improved sexual health outcomes over partial penectomy with potential for comparable oncologic outcomes, particularly in early stage disease [2,9,10]. The lack of outcomes data and non-standardized outcomes reporting for both newer surgical approaches and alternative therapy modalities hinders the ability of cancer patients to make treatment decisions.

In our present study, we showed that U.S. PC patients who underwent glansectomy and/or distal corporectomy had relatively poor erectile health and function after treatment, with 50% reporting poor erection quality and 67% reporting no sexual activity. Despite poor sexual health outcomes, no patients reported a significant negative effect on their procedure satisfaction or QOL, suggesting maintaining sexual function may not be primarily

important to all men undergoing penile cancer surgery.

Our results are in disagreement with two studies from Europe, in which 100% of a combined 32 PC patients receiving glansctomy or distal corporectomy with reconstruction reported adequate postoperative sexual function [11,12]. However, these studies did not use validated questionnaires in their postoperative data collection and did not collect data in a blinded fashion.

Our results were comparable with a third single-institution study from the United Kingdom in which five of 11 (45%) patients reported no sexual activity and two (18%) reported inability to obtain an erection on postoperative questionnaires following glansctomy with skin grafting [13]. The degree of sexual and erectile dysfunction following PC surgery is expected to be higher than an age-matched equivalent group without a history of penile surgery, which is reported as a 17–34% rate of moderate erectile dysfunction of similar age [14]. The rates of sexual dysfunction reported with the use of a validated questionnaire here and in O’Kane et al. fit more closely with expectations than rates reported without the use of a questionnaire [13].

Voiding symptoms reported here were generally very mild, with no cystitis, incontinence, or severe decreases in stream strength reported. Additionally, no patients reported an effect on their QOL based on urinary symptoms following the procedure. The few studies addressing urinary outcomes reported similarly positive results, including all of 179 patients in Philippou et al. reporting successful upright voiding, suggesting organ-sparing surgery for PC may not pose a significant risk for urinary dysfunction [2].

Our conclusions are limited by the very small patient number meeting selection criteria and lack of a control, which could allow for thorough comparison and statistical analysis of many penile cancer treatments.

In conclusion, our study supports excellent overall QOL and urinary QOL after penile-sparing operations for PC. However, sexual function and desire are poorer, with 50% of respondents reporting no sexual function or desire. Curiously, sexual function outcomes did not seem to bear on perceived overall QOL for these men. Finally, the limited reports in this area and wide variability of cultural differences with respect to circumcision

call for multi-institutional, cross-cultural trials using validated questionnaires.

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*Conflict of Interest:* The author(s) report no conflicts of interest.

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