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ORIGINAL RESEARCH

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Understanding decision regret after penile prosthesis surgery in pelvic cancer survivors

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Abstract

Background: Erectile dysfunction is a highly prevalent consequence of pelvic cancer treatment in males. For erectile dysfunction that is refractory to pharmacological intervention, surgical implantation of a penile prosthesis offers a more definitive treatment option. In this paper, we aim to assess patient decision satisfaction and regret levels amongst pelvic cancer patients who subsequently underwent penile prosthesis implantation, as there is a lack of data available amongst this patient cohort. **Methods**: A cross-sectional telephone survey was administered to men who underwent implantation of a penile prosthesis at a single tertiary andrology centre between December 2023 and May 2025. The survey purported to assess specific aspects of the post-prosthesis implantation experience, including cosmesis and ejaculatory function, as well as overall decision satisfaction and regret. Demographics were collected from medical records, and responses were analysed using simple data analysis and Fisher's Exact Tests. **Results**: Eighteen men were identified who had developed erectile dysfunction secondary to pelvic cancer treatment and had subsequently undergone implantation of a penile prosthesis (mean age 62, mean Body Mass Index 28.9). Overall, 72% of patients were either "Happy" or "Very Happy" with their procedure, with only one patient stating that they would "Probably Not" undergo the procedure again. A significant association was identified between increased patient age and reduced decision satisfaction levels ($p = 0.0294$). **Conclusions**: Implantable penile prosthesis is generally a well-tolerated procedure amongst the male pelvic cancer patient cohort, with high overall decision satisfaction rates. This permits more informative pre-operative counselling allowing prospective patients to make more informed treatment decisions, and may provide greater confidence for patients worried about how treatment could affect their sexual function.

Keywords

Penile implant; Pelvic cancer; Satisfaction; Regret

1. Introduction and background

Erectile dysfunction (ED), characterised as an inability to obtain and/or maintain a sufficient erection to facilitate sexual activity, is a highly prevalent sequelae of pelvic cancer treatment in males. A recent meta-analysis found a post-prostate cancer treatment (ED) rate of 78.3% following multiple treatment modalities, both surgical and non-surgical [1]. Given that prostate cancer is one of the most frequently diagnosed cancers in males worldwide [2], there is inevitably a large cohort of male pelvic cancer patients in whom ED is present post therapy.

ED secondary to cancer diagnosis and treatment is multifaceted in aetiology and pathogenesis, with a combination of both organic and psychological factors contributing to the presentation. Pelvic cancer treatment modalities including chemotherapy, radiotherapy, hormonal therapy, and surgical intervention are all potential inducers of ED, with multiple modalities frequently used in combination. This may be via disruption of neurovascular integrity, endocrine dysregulation, or reduced penile tissue health, amongst other possibilities [3].

The impact of ED on a patient's quality of life is well reported, with a known significant association between ED and depressive symptoms [4]. Indeed, in a cohort of patients treated for prostate cancer, depressive symptoms associated with erectile function were found to be present at an average of 4 years post-diagnosis, suggesting a prolonged psychological impact [5]. However, the impact of ED is not only limited to the patient themselves, but can also extend to the patient's partner, with female partners found to engage in significantly less frequent sexual activity following the patient's development of ED, and fewer women reporting satisfaction in their sexual relationship [6].

Management of ED typically begins with a combination of

conservative and/or pharmacological therapies; however, for patients with ED refractory to these interventions, in patients for whom the above interventions are contra-indicated, or according to patient choice, surgical intervention represents a more definitive management option [7]. Consequently, implantable penile prosthesis (IPP) has become an established option in the management of advanced ED, with post-operative satisfaction rates reported as exceeding 80% [8].

Despite these reported high satisfaction levels, satisfaction alone does not necessarily capture the complexity of post-operative experiences. Decision regret acts a distinct patient-reported outcome, which reflects the extent to which patients feel their outcomes align with their pre-decision expectations. Assessment of decision regret as a specific outcome of penile prosthesis insertion may highlight a more intricate or nuanced psychological framework associated with the patient experience, which may not be captured by satisfaction measures alone.

Despite its relevance and an extensive literature review, there is a complete lack of data in relation to decision regret post penile prosthesis insertion in men developing ED post treatment for urological pelvic cancer—a population with unique oncological, functional, and psychosocial considerations. In this paper we therefore attempt to explore overall satisfaction and regret rates following IPP surgery in pelvic cancer patients as primary outcomes, with specific aspects of post-IPP experience assessed as secondary outcomes.

2. Methods

Two hundred consecutive patients undergoing elective penile prosthesis insertion surgery in a single tertiary andrology centre were identified from the patient record system Epic Hyperspace. The following demographics were collected for each patient: procedure type, procedure date, implant type (if applicable), age, indication for procedure, duration of condition (if applicable), prior treatments for condition of indication, revision procedure status, previous penile operation status, diabetic status, consultant *vs.* non-consultant performed procedure, body mass index (BMI), and smoking status. Exclusion criteria included: patients who required a translator to participate, those who were unable to complete the questionnaire verbally via telephone call, patients who had since undergone explantation of prosthesis and patients who were since deceased.

The survey utilised in the study (**Supplementary Table 1**) was designed by Andrologists at the centre and administered by doctors working within the department. Six individual questions were included in the survey, and responses were collected in a 5-point Likert Scale [9] manner, with responses ranging from most negative to most positive. The survey design purported to incorporate aspects of validated pre-existing questionnaires, including the Decision Regret Scale [10] and the Satisfaction Survey for Inflatable Penile Implant (SSIPI) [11]. However, a new survey was utilised as some of the patients within this cohort were expected to have received malleable penile implants, as opposed to inflatable implants only. Thus, the SSIPI questionnaire would not be validated for use amongst these patients, whilst the Decision Regret Scale would not be able to evaluate the specific aspects of penile implant experience intended in this study.

Eligible patients were called via telephone, and informed consent was gained from each participant prior to delivery of the survey verbally. Patient responses were recorded anonymously via Google Forms, and responses were stored securely, accessible only to the study team. All data was anonymised prior to analysis. Simple analysis of responses was performed using Microsoft Excel, utilizing Fisher's Exact Test for this analysis.

3. Results

Of the 200 patients identified in the original dataset, 17 were excluded due to the presence of one of the aforementioned exclusion criteria. Of the remaining 183 patients, 100 patients completed the survey, indicating a response rate of 55% amongst this population. Of the 83 patients whose data was not obtained or included in the analysis, seven declined to complete the survey, whilst 76 patients were unable to be contacted successfully despite multiple attempts.

From the 100 successful patient responses, 18 patients who received an IPP and whose ED developed secondary to pelvic cancer treatment were identified, with a mean age of 62 (range 50–73 years). This consisted of 17 cases of prostate cancer, and 1 case of bladder cancer. 10 patients had undergone surgical intervention for their pelvic malignancy in isolation, 5 had undergone a combination of surgical and non-surgical interventions, and the remaining 3 had undergone only non-surgical interventions as treatment for their malignancy (Fig. 1 and Table 1). The median time from implant to survey participation was 12.7 months.

Three of the eighteen respondents (17%) had not had any sexual intercourse since the procedure. Of those that had (n = 15), various responses were recorded, both in terms of frequency of satisfaction and enjoyment (Figs. 2,3).

With regards to ejaculatory function, two patients had not attempted sexual intercourse or stimulation. Of those that had (n = 16), most (63%) almost never ejaculated (Fig. 4). Overall, only 17% of patients stated that they were unhappy with the cosmesis of the penis post-operatively (Fig. 5).

Overall, thirteen patients (72%) were either "happy" or "very happy" with their procedure, with only one patient claiming to be "very regretful" (Fig. 6) and stating that they would "probably not" undergo the procedure again (Fig. 7).

A significant association was identified between increased patient age and reduced decision satisfaction levels using Fisher's Exact Test, with $p = 0.0294$ ($p < 0.05$). There was no association identified between decision satisfaction levels and: revision procedure status ($p = 1.00$), diabetic status ($p = 0.4902$), primary operator status ($p = 0.1716$), BMI ($p = 1.00$), smoking history ($p = 1.00$), ejaculatory function ($p = 0.6148$) and cosmesis ($p = 0.6078$).

4. Discussion

In this cohort of patients, we found that predominantly positive experiences were reported following the insertion of penile prosthesis, with 72% of patients reporting positive satisfaction

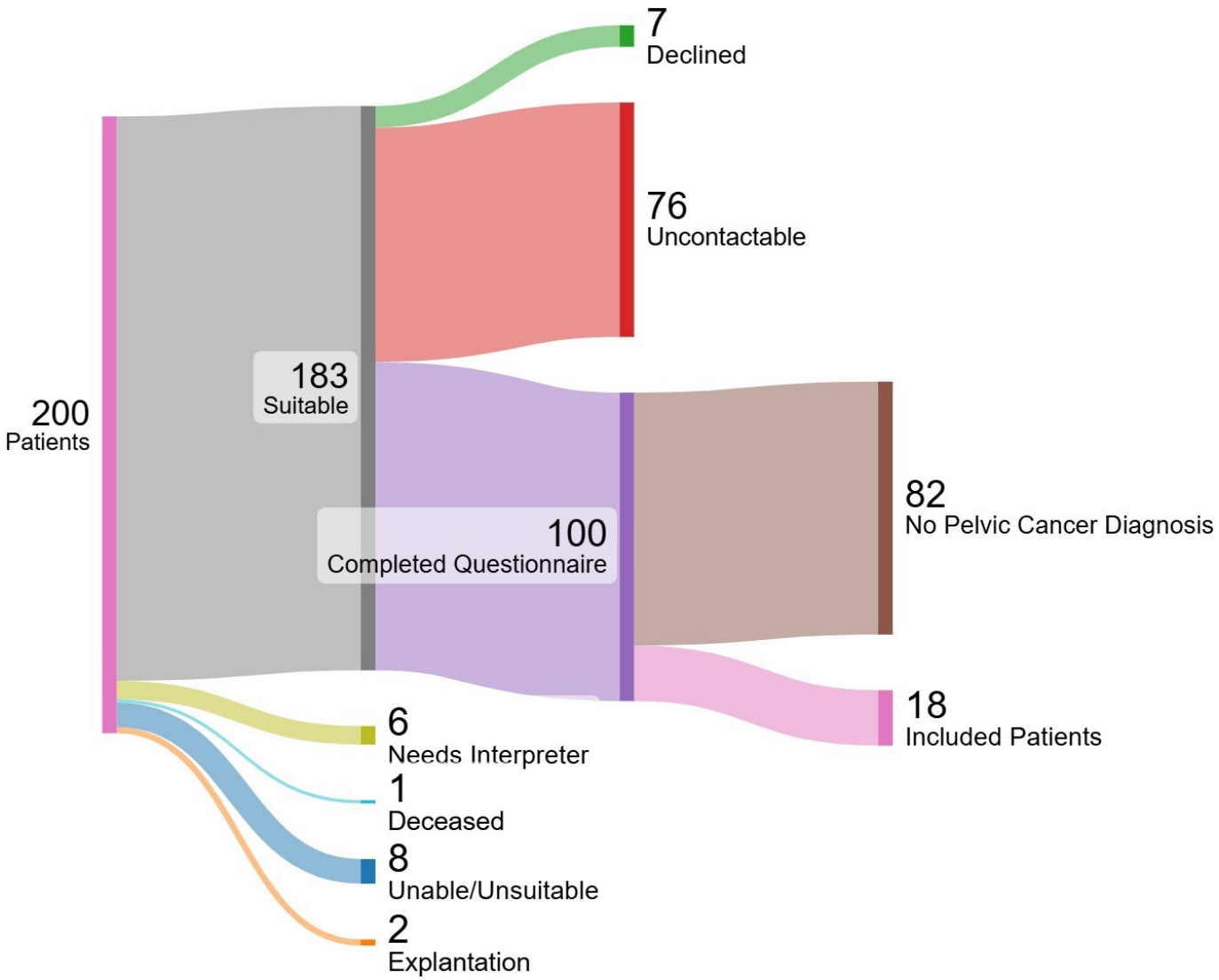

FIGURE 1. Exclusion process.

TABLE 1. Patient demographics.

Demographic	Responses (N = 18)
Age (yr)	Mean 62 (50–73)
Implant Type	Boston CX (7), Boston LGX (1), Coloplast Titan (1), Coloplast Titan Touch (7), Rigicon Malleable (1), Rigicon Inflatable (1)
Pelvic Cancer Diagnosis	Prostate Cancer (17), Bladder Cancer (1)
Treatments	Radical Prostatectomy (9), Radiotherapy (2), Chemoradiotherapy (1), Radical Cystoprostatectomy (1), Radical Prostatectomy + Salvage Radiotherapy (5)
Revision Procedure?	Yes (1), No (17)
Previous Penile Procedure?	Yes (1), No (17)
Primary Surgeon	Consultant (15), Non-Consultant (3)
Diabetic Status	Nil (16), T1DM (1), T2DM (1)
BMI	Mean 28.9 (20.9–38.6)
Smoking Status	Never (12), Ex-smoker (3), Current (1), Unsure/Not Available (2)

BMI: Body Mass Index; CX: Controlled Expansion; LGX: Length and Girth Expansion; T1DM: Type 1 Diabetes Mellitus; T2DM: Type 2 Diabetes Mellitus.

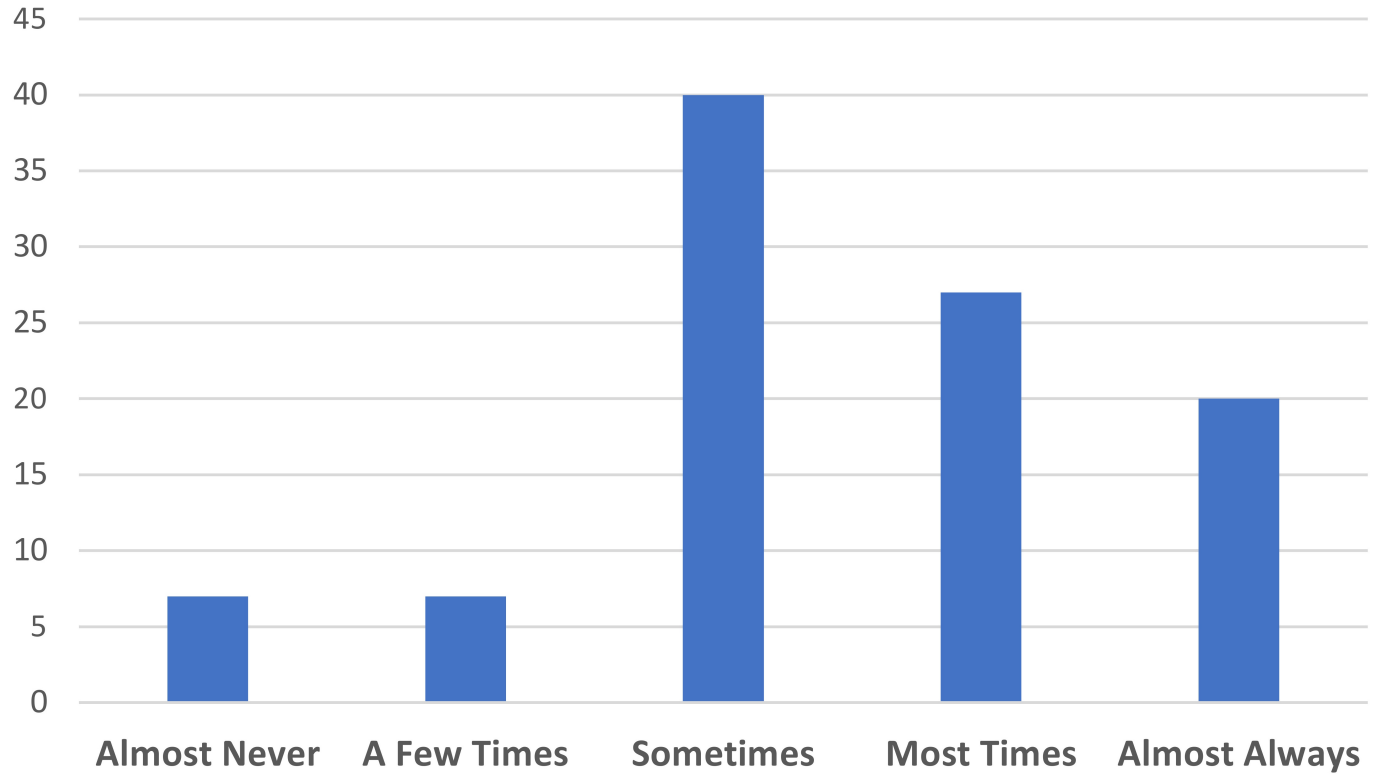

FIGURE 2. "If you have attempted sexual intercourse, how often is it satisfactory for you?" (%).

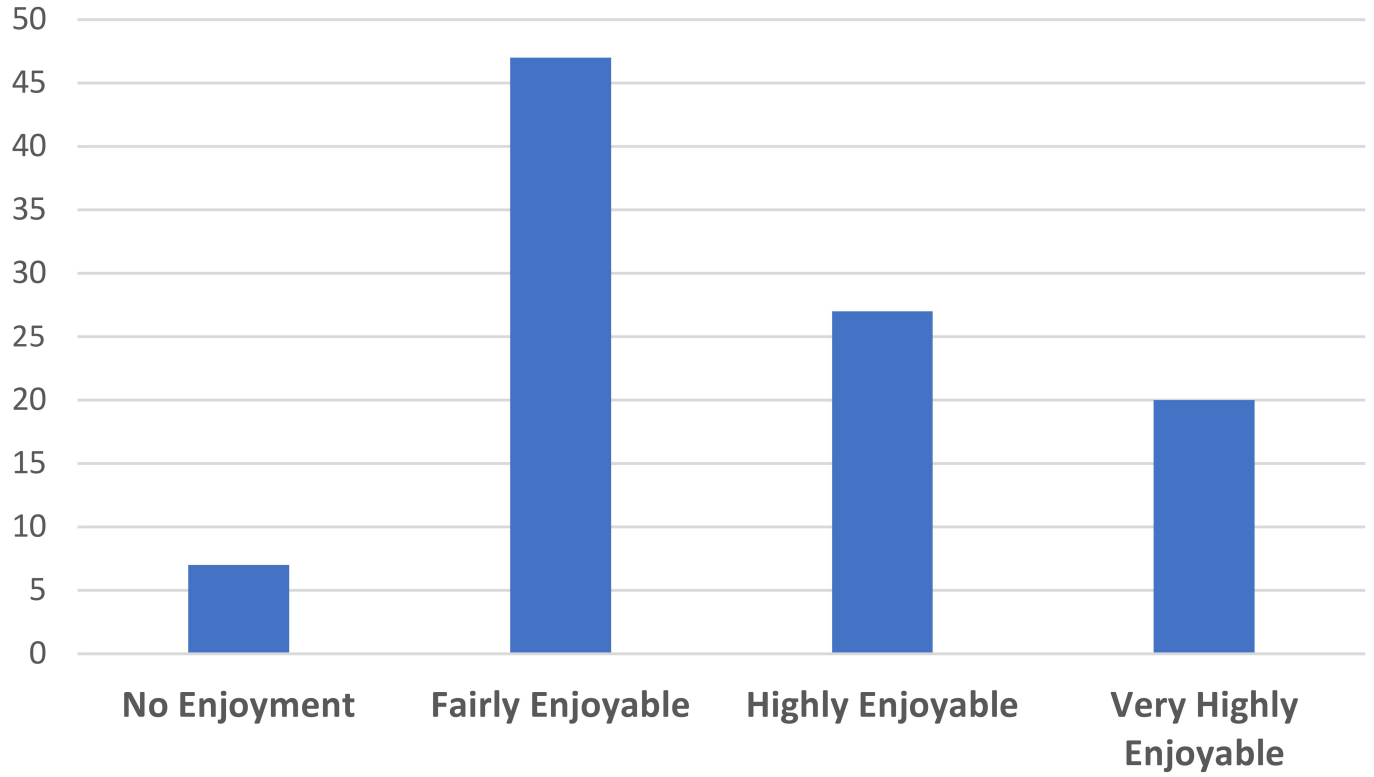

FIGURE 3. "If you have attempted sexual intercourse, how satisfactory is it for you?" (%).

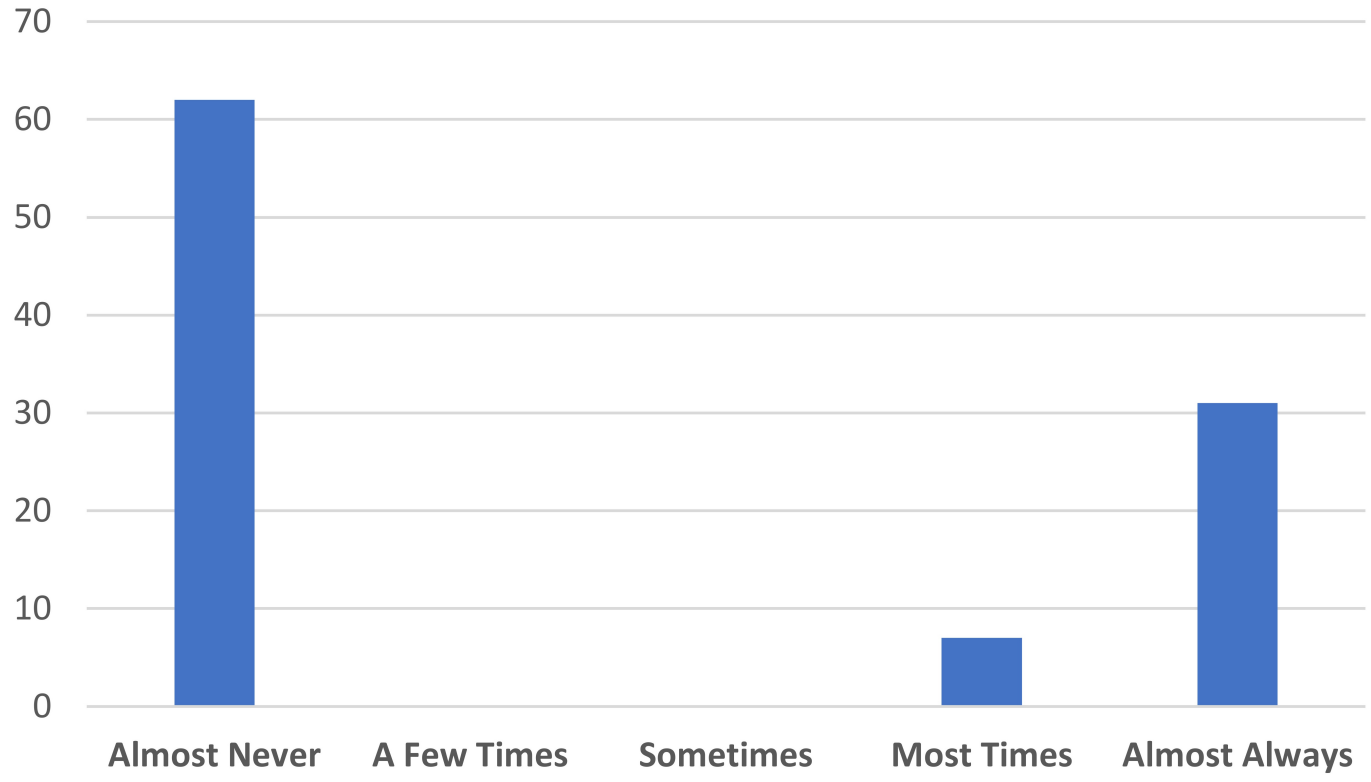

FIGURE 4. "If you have had sexual stimulation or sexual intercourse, how often have you ejaculated?" (%).

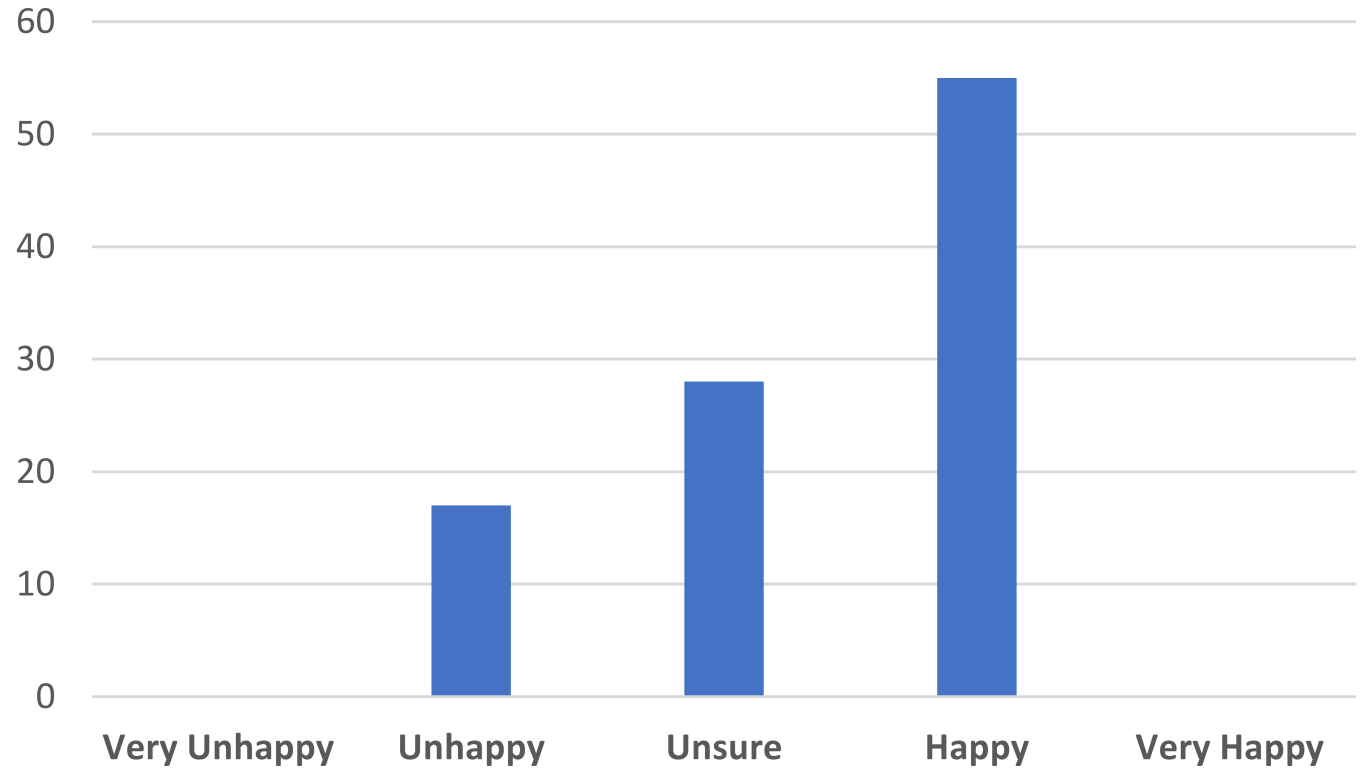

FIGURE 5. Since your operation, how satisfied are you with the cosmesis or "look" of your penis? (%).

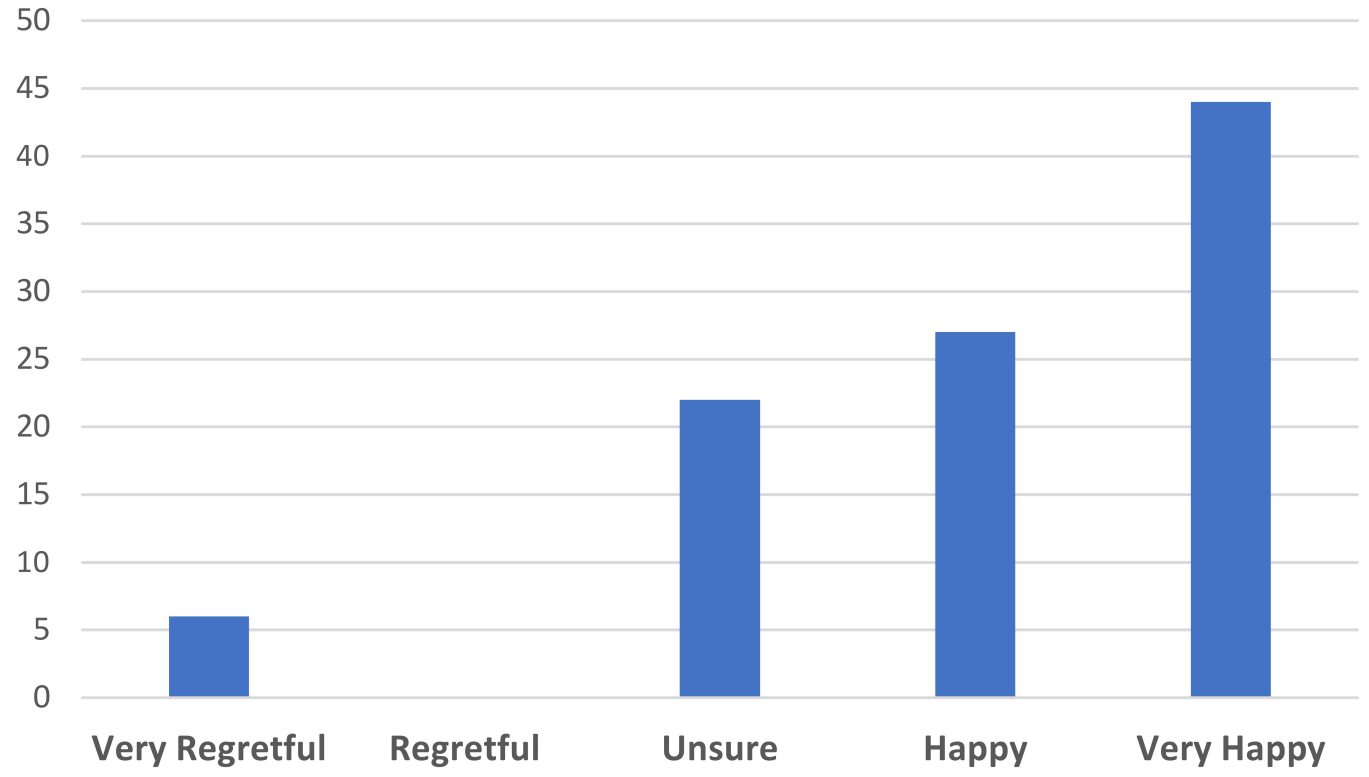

FIGURE 6. "Since your operation, how happy or regretful are you about your penile surgery?" (%).

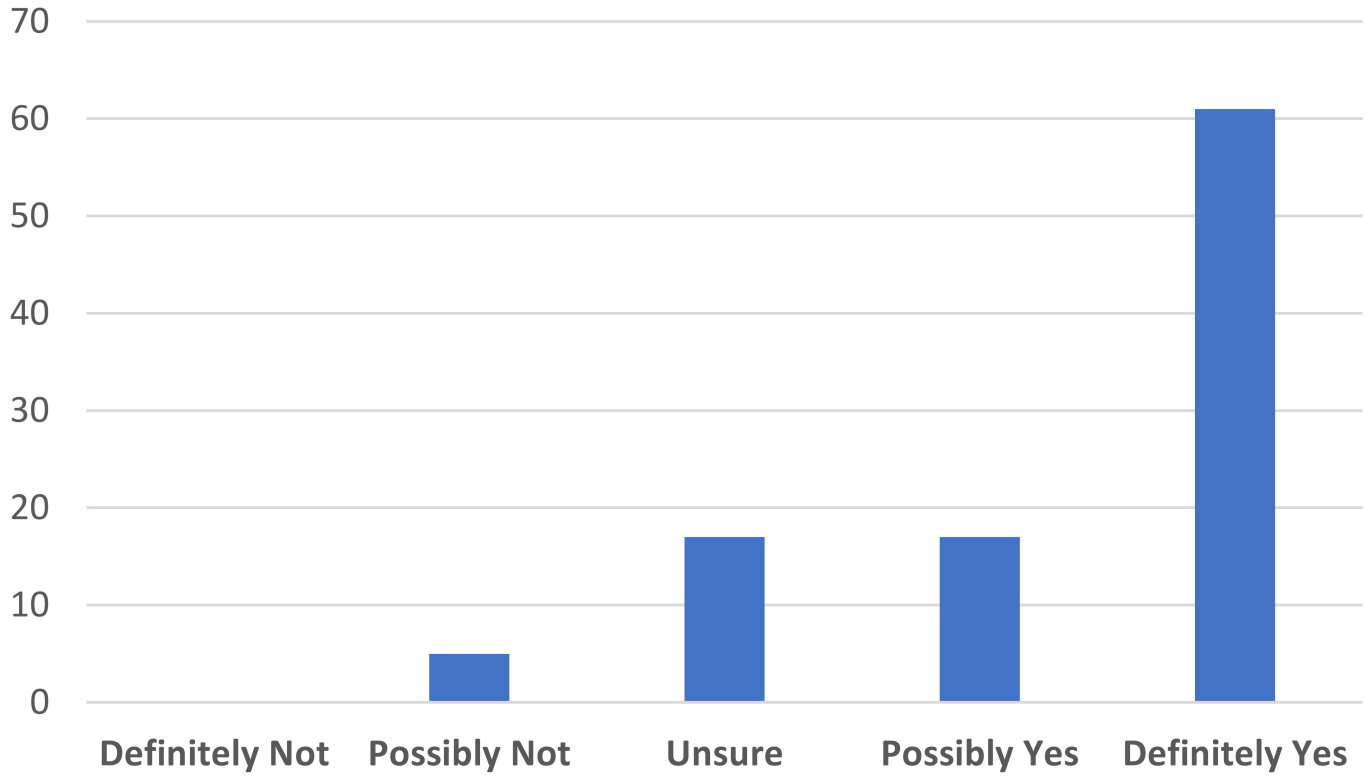

FIGURE 7. "If you were to go back to a time before your surgery, would you undergo this operation again?" (%).

rates, and only 6% of patients expressing significant decision regret. Additionally, 78% of patients answered positively when asked if they would undergo the procedure again, whilst again only 6% of patients responded stating that they would "Possibly Not" have this procedure again.

These findings support the current literature consensus of IPP being a well-tolerated procedure in this population of patients with generally positive satisfaction rates. However, whilst previous data in this field has largely focused on all patients who have received an IPP, the results of this study suggest the notion that IPP satisfaction rates may be high and regret levels low in patients whose ED originates from pelvic

cancers and their associated treatments. This is particularly of note given that we believe this to be the first study to assess IPP decision satisfaction and regret amongst this specific cohort.

Whilst certain individual aspects of post-IPP satisfaction results were low, such as ejaculatory function, this was an expected finding amongst this cohort. Reduced ejaculatory function is a known sequela of multiple pelvic cancer treatment modalities and thus ejaculatory function was likely already diminished prior to IPP procedure [9]. Interestingly, diminished ejaculatory function did not seem to be associated with poor satisfaction or high levels of decision regret. Of the patients who reported poor ejaculatory function, 60% responded that they were either "happy" or "very happy" following their procedure. Similarly, 70% of these patients either "possibly" or "definitely" would undergo the procedure again, whilst the remaining 30% remained "unsure". This suggests that ejaculatory function is not one of the primary aspects that contribute to patient IPP satisfaction or decision regret.

An additional point of note amongst this cohort was the apparent correlation between patient age, and overall satisfaction and decision regret levels. Five patients responded either "Unsure" or "Very Regretful" when discussing their overall IPP experience, and 4 of these 5 patients were older than the mean cohort age of 62 years old (69, 70, 71, and 73 years old respectively). The fifth was 62 years old, whilst all patients below the mean age reported being "Happy" or "Very Happy" with their experience. Using Fishers Exact Test, the association between increased age and reduced overall decision satisfaction levels was found to be significant, with $p = 0.0294$ ($p < 0.05$).

Cosmetic appearance of the penis also seemed to be associated with more negative subjective experiences, with the same 5 patients responding that they were "Unsure" or "Unhappy" with the cosmesis. However, not all patients who reported cosmetic unhappiness also reported decision regret, with others reporting positive overall satisfaction levels. This perhaps suggests that unhappiness with cosmesis is not significant enough in isolation to cause diminished satisfaction levels but is rather a contributing factor amongst others to overall decision regret. Using Fishers Exact Test, there was no significant association found between satisfaction with cosmesis and overall decision satisfaction level in this cohort, with $p = 0.6078$ ($p > 0.05$). There were no further significant associations identified amongst this cohort.

The results of this study could be used to improve specific patient counselling in the pre-operative setting, allowing patients to make a more informed decision prior to deciding to undergo penile prosthesis insertion. Informed consent is a pivotal aspect of pre-operative decision making, and thus having more data available to discuss with patients in this setting could provide prospective patients with more confidence in the decision making process. Whilst satisfaction and regret are of course subjective experiences, being able to discuss potential outcomes of this nature may allow patients to develop more realistic expectations of what they may experience post-operatively.

The primary limitation of this study is the small effective sample size, consisting of only 18 patients, which inevitably constrains the statistical power to detect meaningful differences and limits the external validity of the findings. Therefore, the results of this study should be interpreted with caution, and appreciated in an exploratory fashion, and will certainly require validation in a larger, more representative cohort. However, given that our results are in concordance with other studies of larger populations [8, 12, 13], this suggests that they are a valuable addition to the literature, highlighting the paucity of data relating to decision regret amongst specific aetiological subgroups.

An additional limitation identified with the results of this study is the significant potential for selection bias. Given that there was a survey uptake of 55%, this leaves a significant cohort of patients who did not complete the questionnaire. Patients who experienced more positive subjective outcomes may have been more willing to partake in the study than those who did not, potentially skewing the results in a more positive manner. There is also the possibility of a bi-polar distribution response, with patients with stronger subjective experiences either positively or negatively more likely to complete the survey than those with more midline experiences, also introducing bias. In future studies, further analysis of respondents versus non-respondents may be completed to assess whether there are any identifiable factors or patterns amongst non-responders, to suggest why they did not participate.

Some further limitations to this study include the absence of certain pre-operative baseline measures and characteristics. There are several patient characteristics such as mental health status, partner status, and pre-operative expectations which were not collected for this patient cohort, limiting interpretability of the findings. Inclusion of these characteristics, amongst others, for future studies would provide further avenues of research and interpretation, allowing for more precise findings. Additionally, given that the survey was administered via a telephone call, the potential for interviewer bias exists. Variations in the administration of the survey amongst interviewers may perhaps influence the responses provided by participants, as opposed to a written survey where the administration is standardised.

The observed results provide scope for a larger, multi-centre study aiming to further evaluate decision regret and patient satisfaction and thus provide more robust evidence-based counselling for patients. Additionally, individual aspects of post-IPP satisfaction could be explored in more depth, such as cosmetic appearance and body image. This may be particularly pertinent in the case of patients who undergo radical cystectomy and are subsequently left with a stoma. Given the known association between ED and negative psychological symptoms [5], it would be of interest to ascertain whether subjective levels of body image confidence are improved post-IPP procedure in these patients, utilising a holistic approach to patient outcomes beyond purely sexual function.

Indeed, the current literature emphasizes the importance of a multi-faceted and multi-disciplinary approach to the sexual rehabilitation process following abdominal and pelvic surgeries, addressing not only physical function but also emotional, psychosocial, and relationship-based needs and outcomes [14]. Such an integrated approach to sexual rehabilitation following pelvic cancer treatment has the potential to improve quality of life outcomes far beyond biological sexual function alone.

Whilst penile prosthesis insertion represents a key aspect of sexual rehabilitation for selected patients, these findings underscore the need to consider broader patient factors alongside surgical intervention. Accordingly, counselling, and post-operative follow up for penile prosthesis recipients should be embedded within a comprehensive, multi-disciplinary rehabilitation framework.

5. Conclusions

Patient subjective experiences following IPP are predominantly positive and regret rates low amongst this limited male pelvic cancer population. This is in-keeping with pre-existing literature relating to wider patient populations and provides scope for a wider multi-centre study to validate these findings. However, despite in depth pre-operative counselling some patients still experienced regret and dissatisfaction with certain aspects of their post-IPP experience. Therefore, the existence of additional data related to patient experiences may facilitate even more comprehensive pre-operative counselling, allowing for prospective patients to make more informed decisions and develop more realistic expectations of outcomes.

AVAILABILITY OF DATA AND MATERIALS

Data collected during this research is available upon request.

AUTHOR CONTRIBUTIONS

EM, TS, IP, VM, PG—conception and design. EM, JH, SM, FZ, AH—administrative support. EM—data analysis and interpretation. All authors provision of study materials or patients, collection and assembly of data, manuscript writing, final approval of manuscript.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

All participants in this study provided informed consent prior to participation. The requirement for ethical approval was waived by the Health Research Authority (HRA) algorithm.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

SUPPLEMENTARY MATERIAL

Supplementary material associated with this article can be found, in the online version, at https://oss.jomh.org/files/article/2049378377742073856/attachment/Supplementary%20material.docx.

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