

Anxiety, depression, urinary continence, and sexuality in patients undergoing radical prostatectomy: preliminary findings

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Abstract

Objectives

Evaluate the relationship between psychological distress, namely anxiety and depression, with urinary continence and recovery of erectile function in patients undergoing radical prostatectomy (RP).

Methods

We retrospectively analyzed data from 33 consecutive patients who underwent RP in a single tertiary-referral academy between 01/2018 to 01/2019. We used the International Index of Erectile Function (IIEF-15), the Sexual Complaints Screener for Men (SCS-M), and the Hospital Anxiety and Depression Scale (HADS), validated questionnaires for the assessment of sexual function, anxiety, and depression experiences, respectively. These questionnaires were administered at the pre-surgical visit, after surgery, and at intermediate follow-ups (three, six, and twelve months).

Results

The analysis of the questionnaires completed during follow-up shows that erectile function is the most affected, with 90% erectile dysfunction (ED) at three months after surgery. In terms of emotional states, anxiety prevails in the first months following surgery and is statistically significantly associated with incontinence ($p = 0.02$). Depressive symptoms, on the other hand, appear later and prevail over anxiety at six months after surgery, although not statistically significant.

Conclusions

In the early post-surgical phase anxiety and ED are the most frequently detected components, while depressive experiences and decreased desire, typical of later stages, have not yet fully emerged.

Introduction

Receiving an oncological diagnosis can be a life-altering event that can profoundly impact a person's mental health. The emotional burden of a cancer diagnosis can lead to feelings of anxiety, depression, and fear about the future [1]–[6].

The purpose of the study is to evaluate the relationship between anxiety, depression, urinary continence, and recovery of erectile function in patients undergoing radical prostatectomy (RP). It has been observed that the mere diagnosis of cancer can negatively impact male sexual function [7]. In addition, subsequent hospital visits and pre- and post-operative treatments are a source of psychological tension, anxiety, and a sense of loss of male identity. Although difficulties related to erection have been studied

more [8]–[11], the focus is increasingly expanding to issues such as incontinence [12], anatomical changes in the penis [13], and psychosocial aspects [14]. However, literature on the patient's condition from diagnosis to the first year after surgery is relatively scarce and mostly limited to erectile function as a result of therapy [15].

The urology group collaborated with psychologists from the Clinical Sexology Institute of Rome for this study.

Materials and Methods

Data source and study population

This was an analytical, observational, prospective clinical study designed to evaluate the postoperative outcomes of patients who underwent RP for prostate cancer (PC).

We retrospectively analyzed 33 male patients from 01/2018 to 01/2019 who underwent RP (either laparoscopic or robot-assisted) at the Urology Clinic of the Sapienza University/Policlinico Umberto I. Only patients with a PC diagnosis by ultrasound-guided biopsy, aged between 50 and 72 years old, and undergoing surgical treatment by RP (laparoscopic or robot-assisted) were included. We excluded patients who underwent other oncological treatment, such as radiotherapy, chemotherapy, or hormone therapy both as a primary or adjuvant treatment and the presence of physical or psychological comorbidities at the time of the diagnosis.

Follow-ups were assessed in the Urology and Andrology outpatient clinics. Of the 33 patients, 30 were evaluated at three-month follow-up (T1), 12 at six-month follow-up (T2), and five at twelve-month follow-up (T3).

This study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. After providing written informed consent, patients completed questionnaires before surgery, at three, six, and twelve months follow-up. The Institutional Review Board at Sapienza University Policlinico Umberto I approved the protocol.

Data Collection

For each subject in the study population, the following parameters were evaluated at three, six, and twelve-month follow-ups:

- Urinary continence: evaluated by counting the number of pads used per day (number of pads/day), taking into consideration the rehabilitative activity carried out by the patient and dedicated professionals [16].
- Erectile function: assessed based on the ability to have sexual intercourse and the pharmacological therapy used. In addition, patients were administered the International Index of Erectile Function (IIEF-15) and Sexual Complaints Screener for Men (SCS-M) questionnaires [17], [18]. The IIEF-15

questionnaire was administered preoperatively and at three, six, and twelve months. The SCS-M questionnaire, based on the patient's sexual experiences in the previous six months, was administered at the preoperative visit and the twelve-month follow-up, but was not included in the three- and six-month follow-ups.

- Psychological distress: assessed based on the Hospital Anxiety and Depression Scale (HADS) questionnaire composed of 14 questions and divided into two sections: anxiety (HADS-A) and depression (HADS-D) [19].

Statistical analyses

Descriptive statistics included frequencies and proportions for categorical variables. Continuous variables were reported as mean \pm standard deviation (SD), median, or mode, depending on the most appropriate descriptive method. Data were analyzed using the chi-square test (χ^2) and the association coefficients derived from it, Phi and Cramer's V, in addition to Pearson's correlation coefficient.

All statistical tests were two-sided, with the level of significance set at $p < 0.05$, and were performed with the IBM SPSS Statistics 24.00 operating system [20].

Results

Descriptive characteristics

The study enrolled 33 males with a mean age of 64.1 (interquartile range: 51–72) who underwent RP. Before surgery (T0), none of the patients reported urinary incontinence (UI), and erectile function was preserved in 20 patients (61%).

Questionnaire evaluation at T1 (three months)

At the three-month follow-up, 30 patients (91%) were assessed.

Regarding continence, 11 patients (37%) were continent, 16 patients (53%) used an average of one pad per day, and three patients (10%) used two pads per day (Table 1).

Table 1 – Urinary incontinence at T0, T1, T2

Urinary incontinence (pad/die)			
	0 pad/die	1 pad/die	2 pad/die
T0 (n = 33)	33 (100%)	0 (0%)	0 (0%)
T1 (n = 30)	11 (37%)	16 (53%)	3 (10%)
T2 (n = 12)	7 (58%)	3 (25%)	2 (17%)
<i>T0: before surgery, T1: 3 months follow-up, T2: 6 months follow-up</i>			

Regarding erectile function, pharmacological treatment, phosphodiesterase type 5 (PDE5) inhibitor (Avanafil, Sildenafil, Vardenafil, or Tadalafil), was introduced two weeks after the surgery. PDE5 inhibitors were administered three times per week for nerve-sparing (NS) surgeries. For locally advanced tumors that did not allow complete NS surgery, therapy with intra-cavernous injections of Alprostadil began one month after the surgery to prevent cavernosal body fibrosis. Out of 30 patients, three (10%) had an IIEF-15 score between 26 and 30, and 18 patients (60%) had a score lower than 10 (Table 2). At the three-month follow-up, 10% of the patients showed good erectile function with intra-cavernous prostaglandins, while none of the patients on PDE5 inhibitor therapy had achieved good recovery of erectile function at that time point.

Table 2 – International Index of Erectile Function (IIEF-15) score at T0, T1, T2

International Index of Erectile Function (IIEF-15)					
	No ED	Mild ED	Mild-moderate ED	Moderate ED	Severe ED
	(30 – 26)	(25 – 22)	(21 – 17)	(16 – 11)	(1–10)
T0 (n = 33)	20 (61%)	4 (12%)	3 (9%)	3 (9%)	3 (9%)
T1 (n = 30)	3 (10%)	3 (10%)	2 (7%)	4 (13%)	18 (60%)
T2 (n = 12)	6 (50%)	2 (17%)	1 (8%)	1 (8%)	2 (17%)
<i>T0: before surgery, T1: 3 months follow-up, T2: 6 months follow-up</i>					
<i>ED: erectile dysfunction</i>					

The HADS questionnaires revealed that only six individuals (20%) surpassed or reached the cutoff for depressive symptoms, while anxiety was present in 15 patients (50%) (Table 3).

Table 3 – Hospital Anxiety and Depression Scale (HADS) score at T1, T2

Hospital Anxiety and Depression Scale (HADS-D)		
	No depression (0–7)	Depression (8–21)
T1 (n = 30)	24 (80%)	6 (20%)
T2 (n = 12)	7 (58%)	5 (42%)
<i>T1: 3 months follow-up, T2: 6 months follow-up</i>		

Hospital Anxiety and Depression Scale (HADS-A)		
	No anxiety (0–7)	Anxiety (8–21)
T1 (n = 30)	15 (50%)	15 (50%)
T2 (n = 12)	8 (67%)	4 (33%)
<i>T1: 3 months follow-up, T2: 6 months follow-up</i>		

Statistical analysis indicated a statistically significant association between incontinence and anxiety ($p = 0.02$), with a χ^2 value of 5.400, suggesting a positive correlation. Two measures derived from χ^2 , Phi and Cramer's V, also yielded statistically significant results ($p = 0.02$) with a moderately strong association value of 0.424. Further stratification indicated that 80% of continent patients did not experience anxiety, whereas 65% of incontinent patients reported anxiety.

No statistically significant association was found between UI and depression ($p = 1.00$). However, although not statistically significant, an association between ED and experiences of anxiety and depression was observed. The χ^2 value for the association between ED and anxiety was 2.143 ($p = 0.143$), while for ED and depression was 0.536 (0.456). When Pearson's correlation was used as the metric of interest, an increase in the IIEF-15 score, representing improved erectile function, was associated with a decrease in anxiety and depression scores. Specifically, a 1-point increase in the IIEF-15 score led to a decrease of 0.217 ($p = 0.277$) HADS-A score and a decrease of 0.190 ($p = 0.341$) HADS-D score.

Questionnaire evaluation at T2 (six months)

At the six-month follow-up, 12 patients (36%) were evaluated.

Regarding continence, it was found that seven patients (58%) had fully recovered sphincter function. This positive outcome was particularly observed in patients who actively performed pelvic floor muscle training as part of their daily routine, without the need for a rehabilitation protocol or dedicated personnel and equipment (Table 1).

In terms of ED, patients who did not respond to oral drug treatment switched to intra-cavernous injection with Alprostadil after three months of follow-up. Patients with a partial response to oral drugs achieved

more satisfactory results by using the Vacuum Device.

The HADS questionnaires revealed that only seven individuals (58%) surpassed or reached the cutoff for depressive symptoms, while anxiety was present in eight patients (67%) (Table 3).

Questionnaire evaluation at T3 (twelve months)

It should be noted that only five patients underwent the twelve-month follow-up, and therefore, the data collected during this period are not considered statistically significant.

Discussion

Receiving an oncological diagnosis can significantly impact a person's mental well-being, leading to anxiety, depression, and fear about the future. While previous studies mainly focused on erectile issues or incontinence, this study broadens its scope to the impact of oncological surgical treatment on mental health, especially anxiety and depression. The lack of literature on this topic validates the rationale of the current study, and the preliminary data showed several noteworthy observations.

First, regarding UI, we found that seven patients (7/12, 58%) regained full sphincter function six months after surgery. These percentages are consistent with the existing literature [21], [22]. This positive outcome was particularly observed in patients who adopted a healthy lifestyle and engaged in pelvic floor rehabilitation. Among the patients who used pads, the maximum daily usage was two. No generally shared standard definition of continence exists. This strongly affects the reported number of patients considered continent. Some studies have accepted the use of 1 pad in the continence category (social continence) [23], [24]. If the use of one pad is admitted continence rates rise from 58–83% at six-month follow-up. Moreover, patients with mild incontinence can benefit from various rehabilitation methods to further improve their sphincter function in the subsequent months.

The rate of UI varies depending not only on the definition of incontinence, the timing of evaluation, and the evaluation method used (questionnaires, interviews, etc.), but also on factors such as surgeon experience, type of surgery, tumor stage, and prostate volume.

Second, follow-up questionnaires revealed that ED was the most prominent complication, involving 27 patients (90%) at three months after surgery. These results could be attributed, in some cases, to a lack of libido during the early post-surgery months, in addition to ED. However, thanks to the various post-surgical rehabilitation methods employed, there was a significant improvement in erectile function, with the percentage increasing from 10% at the three-month follow-up to nearly 50% at the six-month follow-up. It is important to note that further recovery in erectile function is expected up to 24 months after surgery [25].

Factors such as age, type of therapy used, and pre-intervention erectile function were found to be significantly associated with functional recovery. Notably, 13 patients (39%) already experienced mild or severe ED before the surgical intervention. Considering these findings and acknowledging the prolonged

nature of the rehabilitation process, our study aligns with the existing literature that reports variable percentages ranging from 10–75% following nerve-sparing unilateral or bilateral surgery [8], [26]. This wide range can be attributed to differences in therapeutic-rehabilitation protocols and the timing of their initiation. Prolonged absence of erections, including nocturnal erections, leads to decreased oxygen tension in the cavernous bodies, resulting in fibrosis. Chronic hypoxia, combined with denervation, triggers apoptosis of smooth muscle fibrocytes, leading to veno-occlusive ED that significantly impacts functional recovery.

Third, evaluation of quality of life after RP has been the main focus in most of the existing studies [14], [27]. Only few studies have reported the correlation of the psychological burden (depression and anxiety) and functional outcomes in RP patients [15], [28]–[30].

From the 2014 review by Watts S et al., it emerged that the prevalence of depression and anxiety in men with PC was relatively high [31]. Therefore, it was considered important for further research to be conducted in this direction to identify the timing and main causes of these experiences. It was still unclear which phases of the treatment journey were most painful. If this had been known, it would have allowed healthcare professionals to intervene by, for example, implementing screening processes and providing psychological support. In our study cohort, the psychological profile of the patients underwent notable changes at the six-month mark compared to the three-month follow-up. Anxiety symptoms regressed, but there was a significant increase in patients with depressive symptoms. This could be attributed to factors such as unsatisfactory recovery of urinary continence, changes in sexual life due to the use of drugs that may make sexual intercourse feel mechanical and lacking spontaneity, and adjustments in daily life and work during the post-surgery convalescence period. Moreover, it was observed that anxiety is typical in the first few months after the intervention and is statistically significantly associated with incontinence ($p = 0.02$). Indeed, the data shows that 80% of continent patients do not experience anxiety, while 65% of incontinent patients report anxiety. On the other hand, depressive symptoms appear later and prevail over anxiety at six months post-intervention, although they do not show statistical significance in our study, mainly due to the small sample size. Similarly, Boeri et al., found that one-third of patients undergoing radical prostatectomy experienced depressive symptoms at six months post-intervention, however, they assessed depression through the Beck Depression Inventory (BDI) questionnaire [30].

Taken together, although the data is currently limited in terms of numbers, it is interesting to note that in the early post-surgical phase, the most frequently observed components are ED as a functional complication and anxiety as an emotional experience. Anxiety is also associated with the potential presence of UI. Depressive experiences and a decrease in desire appear to be more frequent in the later stages and are not fully apparent in the first 6 months post-intervention.

Despite its novelty, our study is not devoid of limitations. First and foremost, the small number of patients. Second, the nature of the study. even though we utilized validated questionnaires, there may still be biases present due to the use of self-reporting questionnaires. Third, assessing preliminary data

leads to short-follow ups data, limiting the ability to assess long-term trends or outcomes, as well as missing data leading to limited statistical power. Moreover, future research should aim to explore additional factors that may influence functional recovery, such as psychological and sexual aspects, as well as the long-term outcomes beyond the twelve-month follow-up. By understanding the complex interplay between physical and psychological factors, we can further optimize patient care and enhance postoperative quality of life for individuals undergoing radical prostatectomy.

Conclusion

In the early post-surgical phase anxiety and ED are the most frequently detected components, while depressive experiences and decreased desire, typical of later stages, have not yet fully emerged.

Declarations

Author Contribution

Conceptualization and Conceptualization: MT, PMM; Data curation: MT, MS, PMM; Formal analysis: MT; Funding acquisition: N/A; Investigation: MT, MS; Methodology: MT, PMM; Project administration: MT, MS, PMM; Resources and Software: MT; Supervision and Validation: PMM, MS; Visualization and Writing: LMIJ, MT

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