



## Prostatic irradiation-induced sexual dysfunction: A review and multidisciplinary guide to management in the radical radiotherapy era (Part III on Psychosexual Therapy and the Masculine Self-Esteem)

Marigdalia K. Ramirez-Fort<sup>a,b,c,d,\*</sup>, Paula Suarez<sup>d</sup>, Margely Carrion<sup>d</sup>, Daniel Weiner<sup>e,f</sup>, Claire Postl<sup>g</sup>, Ricardo Arribas<sup>h</sup>, Mehdi Sayyah<sup>i</sup>, Digna V. Forta<sup>a,j</sup>, M. Junaid Niaz<sup>b</sup>, Amir Feily<sup>k</sup>, Christopher S. Lange<sup>a,c</sup>, Zahhediah Zhaythseff Fort<sup>l</sup>, Migdalia Fort<sup>a,e,f</sup>

<sup>a</sup> Life Sciences, BioFort Corp., Guaynabo, PR, USA

<sup>b</sup> Urology, Weill Cornell Medicine, New York, NY, USA

<sup>c</sup> Radiation Oncology, SUNY Downstate Health Sciences University, Brooklyn, New York, NY, USA

<sup>d</sup> Physiology and Pathology, San Juan Bautista School of Medicine, Caguas, PR, USA

<sup>e</sup> Psychiatry, VA New Jersey Healthcare System, Lyons, NJ, USA

<sup>f</sup> Psychiatry, Robert Wood Johnson UMDNJ Hospital, New Brunswick, NJ, USA

<sup>g</sup> Urology, Ohio State University, Columbus, OH, USA

<sup>h</sup> Psychiatry, San Juan Bautista School of Medicine, Caguas, PR, USA

<sup>i</sup> Psychiatry, Jundishapur University of Medical Sciences, Ahvaz, Iran

<sup>j</sup> Dermatology, Hospitales HIMA San Pablo, Bayamon, PR, USA

<sup>k</sup> Dermatology, Jahrom University of Medical Sciences, Jahrom, Iran

<sup>l</sup> ICE Health Service Corps, U.S. Department of Homeland Security, Washington D.C., USA

### ARTICLE INFO

#### Article history:

Received 13 January 2020

Accepted 20 March 2020

Available online 30 April 2020

#### Keywords:

Prostate cancer

Sexual toxicities

Erectile dysfunction

Ejaculatory dysfunction

Orgasmic dysfunction

Radiation therapy

Psychosexual therapy

Masculine self-esteem

### ABSTRACT

Psychological morbidity, sexuality, and health/system information have been identified as the highest areas of support needs in patients undergoing management of their prostate cancer (PCa). Management of a patient's sexual function prior to, during and after PCa radiotherapy requires multidisciplinary coordination of care between radiation oncologists, urologists, dermatologists, pharmacists, and psychiatrists. The finale of this three-part review provides a framework for clinicians to better understand the role of mental healthcare providers in the management of sexual toxicities associated with prostatic radiotherapy. The authors recommend that patients be referred for psychological evaluation and possibly to individual, couples or group general or cognitive behavioral sex therapy at the time of their PCa diagnosis, for a more specialized focus on management of sexual toxicities and sexual recovery. The importance and implications of the masculine self-esteem, sexual orientation, gender identification, cultural expectations, relationship status and patient education are reviewed. Well-informed patients tend to have a better quality of life outcomes compared to patients that take on a passive role in their cancer management.

© 2020 Published by Elsevier B.V. on behalf of Greater Poland Cancer Centre.

### 1. The role of psychosexual therapy in the treatment of localized prostate cancer

Psychological morbidity (65%), sexuality (49%), and health/system information (59%) have been identified as the highest areas of support needs in patients undergoing management of their prostate cancer (PCa).<sup>1</sup> Mental health professionals having a basic understanding of PCa diagnosis, treatment, and

associated sexual toxicities (described in detail within Part I and II of this series<sup>50,51,52</sup>) can help address patient needs and facilitate overcoming any communication barriers that men may have. An analysis of interviews with 21 men that had undergone treatment for localized PCa identified three themes that make it difficult for men to communicate with their health care team about their sexual dysfunction: 1) it can be too soon to talk about sex; 2) the psychology of sex is missing and, 3) communication is not individually tailored.<sup>2</sup>

Therapy that is geared towards improving communication, normalizing sexuality, providing psychoeducation and accounting for sexual orientation and/or gender identification can help facilitate

\* Corresponding author at: Life Sciences at BioFort Corp. PO Box 1374, Guaynabo, Puerto Rico, 00726USA.

E-mail address: [marigdalia@biofort.io](mailto:marigdalia@biofort.io) (M.K. Ramirez-Fort).

discussions related to sexual toxicities. Therefore, it is of paramount importance for mental health professionals to understand the treatment paradigm of men undergoing prostatic irradiation for cancer. It is of equal importance for radiation oncologists, medical oncologists and urologists to understand the role of mental health professionals in managing radiation-induced sexual toxicities. This mutual understanding enables establishment of general empathy and patient rapport that is a cornerstone to successful psychotherapy, satisfaction with cancer care and overall quality of life (QoL).

### 1.1. Psychogenic process of men that develop sexual dysfunction

A meta-analysis related to sexual intimacy as experienced after localized PCa treatment was used to develop the Loss, Motions, Avoidance and Construction (LMAC) model for understanding the psychogenic process that men with sexual toxicities undergo.<sup>3</sup> The LMAC model identifies common stages to a man's perception and coping with sexual dysfunction: 1) Loss and grief: 'Destroyed intimacy'; 2) Going through the motions: 'Artificial intimacy'; 3) Fear of failure: 'Avoiding intimacy', and 4) Breaking barriers: 'Constructing an alternative intimacy'.

During the first stage, men experience grief, loss, and even frustration as they realize that their sexual performance and orgasm intensity have decreased or subjectively changed during and/or as a result of their PCa treatment.<sup>4</sup> These physical changes influence the psycho-emotional aspect of the affected male thereby resulting in a 'destroyed intimacy'.<sup>3</sup> The loss, in turn, triggers behavioral compensation, also known as 'artificial intimacy'. During this second stage, men incorporate the use of devices to help them achieve a successful erection towards recovering their lost sexual intimacy,<sup>4</sup> however, the results of these efforts can transform into a new source of frustration because 'it does not feel like it used to'. As frustration builds up with each sexual encounter, some men may develop fear of failure, leading to avoidance behaviors.<sup>3</sup> This stage of artificial intimacy may also be influenced by expectations of these available alternate treatments and self-prescribed expectations during sexual intercourse.

Although men are encouraged to maintain sexual activity during and after PCa treatment, some men with sexual dysfunction will still avoid sexual intimacy due to apprehension about sexual contact or fear of shame/embarrassment. Many men report a lack of confidence about their sexual performance that leads them to restrain from kissing or hugging; the intentional prevention of intimacy from happening, further decreases their chances of experiencing satisfactory intimacy.<sup>3</sup> Therefore, mental health providers should focus on enhancing the understanding and acceptance of potential radiation-induced sexual toxicities.

As men oscillate between LMAC stages, they generate sufficient potential energy to break their barriers to reestablish sexual intimacy and are able to 'construct an alternative intimacy'.<sup>3</sup> Men who reached LMAC Stage 4, successfully reported the importance of having a supportive partner during their physical and psychological recovery.<sup>4</sup> While most heterosexual men were optimistic about the improvement of their sexual dysfunction, acceptance was easier for those who had been in a long-term relationship with a supportive partner.<sup>5</sup> Constant work and perseverance to improve their sexual intimacy helped some men overcome and modify their fixed views about sexual intercourse to adopt new ways to experience intimacy and sexual reward.<sup>4</sup> Some examples include practices already common to men who have sex with men (MSM), such as non-penetrative sex alternatives, including oral sex, mutual masturbation, vibratory devices, hugging, and cuddling.<sup>4,6</sup> Lastly, men who adjust to a new way of intimacy express having a deeper understanding of their partner's emotional and physical needs, and

report that these changes have strengthened their pair-bonding and/or partnered relationship.<sup>3</sup>

### 1.2. Considerations for patient sexuality and gender identification

Patient sexuality is an important consideration when providing patients with sexual health counseling and education. Most research has focused on how heterosexual men are affected by sexual side effects, thereby excluding a significant portion of PCa survivors who are gay and/or bisexual.<sup>7</sup> A comparison study of 124 gay and bisexual men and 225 heterosexual men was performed to evaluate differences in psychological distress and sexual changes following treatment for PCa.<sup>7</sup> The study showed that while all men did report significant psychogenic symptoms, the gay and bisexual population experienced lower masculine self-esteem ( $P < 0.001$ ), increased psychological distress ( $P = 0.005$ ), and increased ejaculatory concern ( $P < 0.001$ ) as compared to heterosexual men.<sup>7</sup> These differences support the view that psychosexual therapy should be individualized and encompass the sexual orientation or gender identification of the patient as part of the personalized medicine era.

While heterosexual couples view vaginal penetrative sex as their primary sexual practice, homosexual male couples seem to prefer mutual masturbation and oral sex, over anal intercourse.<sup>6</sup> The latter is perhaps due to concerns for transmission of blood-borne pathogens. Also, reports identify a group of MSM that view casual intercourse as a way to establish friendships and/or relationships.<sup>7</sup> Therefore, anejaculation can be associated with decreased ability to establish new friendships (i.e., social support) due to decreased self-confidence and self-image of manliness.<sup>6</sup> Similarly, increased time to reach orgasm, decreased orgasm intensity and duration may adversely affect pair-bonding with friends and/or romantic partners.<sup>6</sup> Sexual roles during anal intercourse are also part of gay/bisexual identity and can be a source of barriers to sexual encounters.<sup>7</sup> For instance, PCa irradiation rectal bleeding affects anal receptive intercourse and this can generate conflicts between sexual partners.<sup>7</sup>

Contrary to heterosexual couples, MSM couples reported better adjustment to sexual side effects, whether the relationship was new, or the relationship was long term.<sup>6</sup> Importantly, MSM have a tendency to adopt flexible sexual practices such as casual sexual encounters outside their current relationship. This factor helps MSM couples decrease tension when a sexual role (i.e., insertive versus receptive anal intercourse) has become compromised by PCa therapy.<sup>6</sup>

### 1.3. Expectations and Cultural Considerations

Penile rehabilitation<sup>51</sup> throughout prostate radiotherapy aims to preserve cavernosal endothelial and smooth muscle function, nerve conduction and ductal patency. The first step involves counseling the patient and their partner towards working through their frustration and continuing their sexual practices throughout PCa treatment. Prior to initiation of radiotherapy, it is important to facilitate patient understanding of the toxicities, and to clearly identify the patient's expectations and therapeutic goals.

Most men choose to treat their cancer (i.e., potentially life-threatening condition) despite the known possible sexual toxicities (i.e., treatable and mostly self-limiting conditions) associated with the prostate irradiation.<sup>5</sup> However, those who reported feeling disappointed with their cancer treatment outcomes, felt that they did not have realistic expectations of possible toxicities and/or the duration (i.e., potential permanence) of said toxicities, prior to undergoing treatment for PCa.<sup>4</sup> In fact, a portion of these dissatisfied men indicated that their treating physician did not understand their sexual health priorities.<sup>4</sup> Therefore, clear expectations related

to PCa treatment and associated sexual toxicities should be discussed with men before, during, and after PCa treatment. Utilizing standardized sexual health questionnaires can aid in monitoring a patient's erectile function and orgasm quality before, during and after treatment.<sup>16</sup>

In cultures that emphasize virility, threats to masculinity may be damaging to the affected man's identity. Erectile dysfunction (ED) can leave men feeling powerless or "less of a man." Severe disappointment as a result of ED can have a negative impact on sexual desire. Men commonly report a decreased QoL and difficulties in their relationships after PCa treatment.<sup>7</sup> Men may also have difficulty dealing with a cancer diagnosis because of "cultural expectations of masculinity" expecting a show of strength in the face of illness. A majority of men report a loss of masculinity after PCa treatment, with one-third of men reporting the loss as moderate to severe.<sup>8</sup> Considering an individual's definition of masculinity and identifying cultural influences is essential in being aware of each patient's specific needs.

Additional toxicities, often experienced, that have cultural considerations are ejaculations and orgasms. Some men eroticize semen (e.g., experiencing increased arousal or excitement from the expulsion of semen during ejaculation, the fetishization of condomless sex, etc.), and for those men that develop dry orgasm (or decreased expulsion), the lack of that eroticized part of the sex act may make them feel like they are "less" than they previously were. Semen-loss anxiety, also known as Dhat syndrome,<sup>9</sup> a culturally-bound version of this concern seen in India, entails individual loss of an essential "powerful bodily substance", and can be an important consideration when addressing the psychological component of sexual dysfunction. Most men and women believe semen visualization indicates the culmination of the male orgasm, confirmation of the man's pleasure and the end of sexual intercourse.

In certain religious cultures, it may be viewed as inappropriate to discuss sexual problems with non-family members or members of the opposite sex. These longstanding communication barriers sometimes lead patients of these cultures to believe that their dysfunction is untreatable, or the dysfunction becomes inexplicable in the patient's mind. Facilitating understanding and circumstance acceptance is an important step towards seeking out treatment options and alternative sexual practices (i.e., LMAC Stage 4).

In addition to cultural and religious expectations, age at which a man is diagnosed and treated for PCa also determines the psychological impact of sexual toxicities after treatment. A study by Bertero et al. suggests that younger men (<65) who were single or partnered and family-planning experience more distress related to establishing/maintaining new relationships and fertility, respectively.<sup>5</sup> While older men (>65) had better adjustment to sexual side effects than younger men because they already resolved in their minds that sexual function naturally declines with age.<sup>5</sup>

#### 1.4. Behavioral Endocrine Considerations

The endocrinology behind human, gender identification, and sexual orientation, with respect to arousal, erection, orgasm, and/or ejaculation is not fully elucidated. However, the role of prolactin has been heavily evaluated throughout the past 40 years. Prolactin release is associated to sexual satiety and therefore decreases the state of arousal via central dopaminergic inhibition. Hypoprolactinemia in the setting of men with sexual dysfunction may signify lack of sexual satiety and is associated to increased symptoms of anxiety and depression.<sup>10,11</sup> Given the inhibitory role of prolactin in normal male sexual physiology, decreased prolactin secretion (as a result of lower sexual activity or decreased satiety), may further perturbate dopamine signaling, causing neurodegenerative and behavioral changes associated with dopaminergic or

serotonergic processes. Low levels of prolactin are also associated with ED, reduced ejaculate and seminal vesicle volume.<sup>10,11</sup>

Men are encouraged to maintain sexual activity throughout radiation therapy so as to mitigate these adverse hypoprolactinemic symptoms. Coitus conditions are 400% more effective in stimulating prolactin secretion than methods that involve peripheral stimulation (e.g. masturbation), suggesting that there is a strong central (perhaps psychological) and shared component to sexual satiety.<sup>12</sup> In the context of peripheral sexual toxicity from radiation, psychosexual therapy should focus on fortifying the psychoneuroendocrine axis and incorporating treatments that could lessen the effects of peripheral toxicity (e.g., vibratory stimulators, VEDs, PDE5i, etc), while enhancing LMAC Stage 4.

#### 1.5. Cognitive Behavioral Therapy in the setting of radiation induced sexual toxicities

Cognitive Behavioral Therapy (CBT) is a form of psychosocial therapy that aims to adjust patients' thoughts/perceptions and patterns of belief towards adopting healthier behavior.<sup>13</sup> Addressing the psychosocial component of sexual toxicities related to PCa irradiation, ultimately helps patients adopt healthier coping mechanisms (e.g., intellectualization), develop acceptance and, ultimately, develop a new, health state of sexual intimacy; CBT has already shown to be highly effective in men with PCa that demonstrate higher self-consciousness and interpersonal sensitivity at baseline.<sup>16</sup>

Cognitive behavioral stress management (CBSM) psychotherapy provides techniques and strategies that help patients develop healthy coping skills for dealing with negative emotions and behaviors. There is evidence to support that CBSM improves patient outcomes in terms of sexual function, depressive symptoms, and isolation tendencies, compared to controls.<sup>14</sup> Benefit finding (BF), a measure of patient's perceived positive association to family relations and QoL after PCa treatment, has been shown to significantly improve with CBSM; specifically, CBSM was a significant predictor of postintervention QoL and BF measures ( $p < 0.05$ ).<sup>15</sup> These findings support the utility of conceptual psychotherapy models that identify affect regulation, anxiety reduction, strengthen coping mechanisms and teach stress management exercises.

CBT has shown to significantly improve masculine self-esteem, confidence and sexual satisfaction by enabling men to re-define their masculinity, intimacy, and identity throughout their PCa treatment. CBT may be offered to patients individually or to couples; however, group sessions help to 'normalize' the overall experience and to identify negative self-beliefs resulting from radiation-induced sexual toxicities.<sup>16</sup> Group CBT has demonstrated significant efficacy and QoL improvement related to sexual intimacy ( $p = 0.057$ ), sexual confidence ( $p < 0.001$ ), and masculine self-esteem ( $p = 0.001$ ).<sup>16</sup> Interestingly, PCa patients with higher interpersonal sensitivity tied masculinity more strongly with sexual function ( $r = 0.29$ ).<sup>17</sup> Results in studies such as these support incorporating the implications of how an individual's interactions with others determine their sense of security and identity (i.e., Interpersonal Theory of Personality) into individualized or group therapy.

#### 1.6. Couples therapy

Relationships change before, during and after cancer treatment. Partners working as a team are forced into patient and caregiver roles. These role changes can have a negative impact on both the patient and partner, increase relationship distress, cause depression, and anxiety. A recent pilot study suggests that couple-based intervention addressing sexual, relational, and emotional aspects of the relationship with Family Systems Theory and sex therapy

leads to decreased levels of anxiety and depression.<sup>18</sup> Further, current pilot studies have identified models of CBT that can reestablish intimacies for couples in which PCa related sexual toxicities require novel approaches that deviate from traditional phallogocentric ideals of sexual gratification.<sup>1</sup>

Cognitive existential couples therapy (CECT) specifically focuses on the effects of PCa diagnosis, treatment, and recovery on spousal relationships. This form of CBT has been shown to significantly improve adaptive coping strategies ( $p=0.03$ ) and problem-focused coping strategies ( $p=0.01$ ).<sup>19</sup> Relationship parameters, such as cohesion ( $p=0.07$ ) and conflict resolution ( $p=0.01$ ), significantly improved following CECT, whereas relationship function ( $p=0.09$ ) followed a trend towards significant improvement.

Notably, younger couples demonstrated a significant benefit with CECT, in reporting reductions in cancer associated stress ( $p=0.008$ ). Intimacy Enhancing Therapy (IET) is another effective form of couples CBT, developed from the Relationship Intimacy Model of Cancer Adaptation; when controlling for covariates, relationship satisfaction significantly improved following IET intervention compared to baseline values ( $p < 0.0001$ ).<sup>20</sup>

Data suggests that a preemptive awareness, understanding and acceptance of the sexual toxicities can enable a closer couple bond. Based on a mutual understanding and circumstance acceptance, couples are able to explore alternative sexual practices to increase sexual satisfaction in their new situation.<sup>21,22</sup> Similarly, partners' interest in sexual activity and acceptance of erectile aids helps in the recovery of sexual intimacy. Partners play a significant role in PCa treatment and recovery; inclusion of partners in both medical and psychosexual treatment is crucial.<sup>23</sup>

### 1.7. Sexual motivation and neuroendocrine considerations

Radiotherapy can impact sexual motivation (i.e., libido) both physically and psychologically. Libido is also adversely affected when men undergo chemical castration with androgen deprivation therapy (ADT) during radiation therapy. Men experiencing sexual dysfunction (including decreased sexual motivation) may experience feelings of sadness, helplessness and low self-esteem.<sup>24</sup> Addressing aspects of confidence, self-esteem, and masculinity can help these patients cope with the physical effects of both radiation toxicity and chemical castration while also decreasing symptoms of anxiety and depression.

After radiotherapy, men must contend with an experience they may consider wholly different and less rewarding than their pre-irradiation erection, ejaculation and orgasm. Some men may have to adjust to new or decreased sensations during orgasm. The new sensations could involve pain during sexual intercourse or during ejaculation. Pain can cause the development of a phobia or fear of future sexual intercourse and decrease sexual motivation.

Likewise, changes in physical appearance can negatively impact sexual self-confidence and masculine self-esteem and must, therefore, be addressed medically to optimize the efficacy of psychosexual therapy (particularly sexual cognition and confidence). For instance, the development of gynecomastia during androgen deprivation therapy (ADT) has been shown to adversely affect the masculine self-esteem of single, partnered, hetero or homosexual men and decrease sexual motivation.<sup>5</sup> Therefore, men that are prescribed long-term ADT (i.e., > 6 months) should be counseled on the risk for gynecomastia and be offered mitigative therapies (e.g., breast bud irradiation). Prophylactic breast bud irradiation can effectively reduce the incidence of ADT induced gynecomastia.<sup>25</sup> In fact, a study by Tyrell et al. demonstrated that only 52% of men in the treatment group receiving a 10 Gy single fraction during ADT developed gynecomastia, whereas 85% of men in the control group (i.e., placebo radiation during ADT) developed gynecomastia.<sup>25</sup>

Higher radiation doses (i.e., 20 Gy in 5 fractions) or breast reduction surgery are viable options for men that have already developed gynecomastia.<sup>26</sup>

Improved physical and aesthetic perception can help modify an individual's sexual self-schema and thus improve masculine self-esteem. There is evidence to support that facial expressions and aesthetic perception is involved in the pathophysiology and treatment of patients with major depressive disorder. Botulinum toxin A injection of corrugator and procerus muscles has been shown by multiple groups to induce a significant and sustained antidepressant effect 6 weeks after injection.<sup>27,28</sup> Facial scars or fine lines can be easily improved with fractional CO<sub>2</sub> lasers (Fig. 1a,b); dermal fillers can further enhance the aesthetics of facial expression (Fig. 1e,f).

Similarly, men whose sexual self-confidence and masculine self-esteem is affected by androgenetic alopecia can be recommended to undergo trichopigmentation and/or hair transplantation (Fig. 1c,d)<sup>29–31</sup>; pubic hair grooming may also be considered.<sup>32</sup> Lastly, adequate management of pre-existing skin conditions or recurring skin infections such as severe inflammatory acne, psoriasis, keloids, vitiligo or herpetic reactivations may significantly improve libido.<sup>32–42</sup>

Antidepressant medications are frequently prescribed for patients who have been given a diagnosis of cancer with co-morbid depression.<sup>43</sup> Selective serotonin reuptake inhibitors (SSRIs) and serotonin-norepinephrine reuptake inhibitors (SNRIs), in particular, are well known for their sexual side effects of an impaired excitation phase (usually paroxetine) and delayed orgasm.<sup>24,44</sup> A non-serotonergic antidepressant, namely bupropion, which works as an inhibitor of norepinephrine and dopamine reuptake, does not have these sexual side effects, and may be a helpful adjunct to SSRIs/SNRIs in addressing them. In addition, cyproheptadine, mirtazapine and methylphenidate, which are anti-serotonergic and adrenergic, respectively, may also address the negative effects of SSRIs.<sup>24</sup>

### 1.8. Patient education and referrals

Prior to radiation therapy, the potential emotional and relational consequences of treatment should be discussed during the radiotherapy consenting process. Excluding comprehensive cancer centers, the majority of patients experiencing psychosexual toxicities may perhaps only receive access to mental health clinics if they have a pre-existing psychiatric condition, develop depression, anxiety or an adaptive disorder. Therefore, it is recommended that patients be referred for psychological evaluation and possibly to individual, couples or group sex therapy at the time of their PCa diagnosis for a more specialized focus on management of sexual toxicities and sexual recovery.<sup>45</sup>

Sexual health counseling and patient education provided to PCa patients can help address specific psychological or interpersonal factors related to cancer treatment. Group education seminars have been shown to be an effective medium for providing patients with information regarding their PCa treatment.<sup>46</sup> Peer or nurse-delivered telephone support has also been shown to help link patients with available treatments for sexual dysfunction.<sup>47</sup>

The importance of educating patients remains a valuable predictor of satisfaction and post treatment outcomes. Studies have shown that patients request information related to both physical and psychological changes expected throughout all stages of PCa treatment; information in the form of printed material, articles, pamphlets, and books were preferred.<sup>48</sup> Patients also preferred the "shared decision making" (versus autonomous and passive models) between the physician and patient.<sup>48</sup> Well-informed patients tend to have better outcomes compared to patients that take on a passive role in their cancer management. These men feel more in control,



**Fig. 1.** Sexual self-confidence and the masculine self-esteem are directly affected by patient's self image. Improving a patient's perception of the self through improved cosmesis can improve self-confidence and the masculine self-esteem, therefore improving a patient's sexual function. A and B, demonstrates the before/after picture of a facial scar that was successfully treated with a fractional CO<sub>2</sub> laser. C and D, is the before/after photograph of a man that underwent a hair transplantation. E and F, depicts the aesthetic enhancement of a man's facial expression with the use of dermal fillers.

empowered, accompanied and have realistic expectations towards treatment outcomes and satisfaction. The perceived choice, control and involvement in their PCa intervention, ultimately result in improved patient satisfaction and coping with toxicities.<sup>49</sup> Sufficient patient education can better prepare the patient, increase satisfaction, and outcomes should complications arise. In the setting of radical prostatectomy, poor patient counseling, in regard to ED, has already been shown to negatively impact satisfaction rates to 33.3% ( $p < 0.001$ ) satisfaction, while patient satisfaction in the well-informed cohort approximated 85% ( $p < 0.001$ ).<sup>48</sup>

## 2. Conclusions

The authors recommend that all patients undergo a psychiatric evaluation prior to receiving prostatic radiotherapy. A referral for a healthcare professional prior to prostate irradiation also allows men to meet with a specialist and know they have a resource going forward during and after treatment that can work with them on any issues that may develop.

The discussion of expectations is **crucial** for the management of sexual toxicities and QoL outcomes. A patient's communication needs and information processing abilities may fluctuate throughout the treatment of their PCa; therefore, the mental health specialist should mind that psychosexual therapy is a dynamic process. The process should be individually tailored to encompass psychosexual needs (e.g., culture, sexual motivations (libido), sexual orientation, gender identification and relationship status).

Mental health issues, such as depression or loss of intimacy with the partner, must not be forgotten as these can be devastating for men and couples, in general. Indeed, CBT has shown to significantly improve masculine self-esteem by re-defining masculinity, intimacy, and identity during and post-treatment. Participation in these interventions notably increases sexual confidence and satisfaction, highlighting the role of psychosocial dynamics in PCa treatment-related sexual toxicities. Partner involvement and group support therapy effectively target sexual recovery by providing stress management skills, equipping partners with effective communication strategies, and setting realistic expectations within a supportive environment.

Prostate cancer is a curable disease and the care offered to men towards management of toxicities is just as important as their definitive therapy to preserve and improve their QoL.

## Conflict of interests

The authors have no conflicts of interest to disclose. Author, Dr. Zahedia Z. Fort, is employed as a clinical director by the Department of Homeland Security; the views presented are those of the author in her own personal capacity and do not represent the views of the Department of Homeland Security or the U.S. Government.

## Financial disclosure

None declared.

## References

- Lintz K, Moynihan C, Steginga S, et al. Prostate cancer patients' support and psychological care needs: Survey from a non-surgical oncology clinic. *Psychooncology*. 2003;12(8):769–783.
- Speer SA, Tucker SR, McPhillips R, Peters S. The clinical communication and information challenges associated with the psychosexual aspects of prostate cancer treatment. *Soc Sci Med*. 2017;185:17–26.
- Tucker SR, Speer SA, Peters S. Development of an explanatory model of sexual intimacy following treatment for localised prostate cancer: A systematic review and meta-synthesis of qualitative evidence. *Soc Sci Med*. 2016;163:80–88.
- Albaugh JA, Sufrin N, Lapin BR, Petkewicz J, Tenfelde S. Life after prostate cancer treatment: a mixed methods study of the experiences of men with sexual dysfunction and their partners. *BMC Urol*. 2017;17(1):45.
- Bertero C. Altered sexual patterns after treatment for prostate cancer. *Cancer Pract*. 2001;9(5):245–251.
- Lee TK, Handy AB, Kwan W, et al. Impact of Prostate Cancer Treatment on the Sexual Quality of Life for Men-Who-Have-Sex-with-Men. *J Sex Med*. 2015;12(12):2378–2386.
- Ussher JM, Perz J, Kellett A, et al. Health-Related Quality of Life, Psychological Distress, and Sexual Changes Following Prostate Cancer: A Comparison of Gay and Bisexual Men with Heterosexual Men. *J Sex Med*. 2016;13(3):425–434.
- Zaider T, Manne S, Nelson C, Mulhall J, Kissane D. Loss of masculine identity, marital affection, and sexual bother in men with localized prostate cancer. *J Sex Med*. 2012;9(10):2724–2732.
- Prakash O. Lessons for postgraduate trainees about Dhat syndrome. *Indian J Psychiatry*. 2007;49(3):208–210.
- Corona G, Mannucci E, Jannini EA, et al. Hypoprolactinemia: a new clinical syndrome in patients with sexual dysfunction. *J Sex Med*. 2009;6(5):1457–1466.
- Rastrelli G, Corona G, Maggi M. The role of prolactin in andrology: what is new? *Rev Endocr Metab Disord*. 2015;16(3):233–248.
- Brody S, Kruger TH. The post-orgasmic prolactin increase following intercourse is greater than following masturbation and suggests greater satiety. *Biol Psychol*. 2006;71(3):312–315.
- Chand SP, Kuckel DP, Huecker MR. *Cognitive Behavior Therapy (CBT)*. Treasure Island (FL): StatPearls; 2019.
- Traeger L, Penedo FJ, Benedict C, et al. Identifying how and for whom cognitive-behavioral stress management improves emotional well-being among recent prostate cancer survivors. *Psychooncology*. 2013;22(2):250–259.
- Penedo FJ, Molton I, Dahn JR, et al. A randomized clinical trial of group-based cognitive-behavioral stress management in localized prostate cancer: development of stress management skills improves quality of life and benefit finding. *Ann Behav Med*. 2006;31(3):261–270.
- Siddons HM, Wootten AC, Costello AJ. A randomised, wait-list controlled trial: evaluation of a cognitive-behavioural group intervention on psychosexual adjustment for men with localised prostate cancer. *Psychooncology*. 2013;22(10):2186–2192.
- Molton IR, Siegel SD, Penedo FJ, et al. Promoting recovery of sexual functioning after radical prostatectomy with group-based stress management: the role of interpersonal sensitivity. *J Psychosom Res*. 2008;64(5):527–536.
- Robertson J, McNamee P, Molloy G, et al. Couple-Based Psychosexual Support Following Prostate Cancer Surgery: Results of a Feasibility Pilot Randomized Control Trial. *J Sex Med*. 2016;13(8):1233–1242.
- Couper J, Collins A, Bloch S, et al. Cognitive existential couple therapy (CECT) in men and partners facing localised prostate cancer: a randomised controlled trial. *BJU Int*. 2015;115(Suppl 5):35–45.
- Manne SL, Kissane DW, Nelson CJ, Mulhall JP, Winkel G, Zaider T. Intimacy-enhancing psychological intervention for men diagnosed with prostate cancer and their partners: a pilot study. *J Sex Med*. 2011;8(4):1197–1209.
- Fode M, Ostergren P, Jensen CF, Azawi N, Frey A, Sonksen J. An active sex life is possible for men undergoing androgen deprivation therapy for prostate cancer. *Ugeskr Laeger*. 2015;177(24).
- Wassersug RJ. Maintaining intimacy for prostate cancer patients on androgen deprivation therapy. *Curr Opin Support Palliat Care*. 2016;10(1):55–65.
- Wittmann D, Carolan M, Given B, et al. What couples say about their recovery of sexual intimacy after prostatectomy: toward the development of a conceptual model of couples' sexual recovery after surgery for prostate cancer. *J Sex Med*. 2015;12(2):494–504.
- Sadock BJ, Kaplan HI, Sadock VA. *Kaplan & Sadock's synopsis of psychiatry: behavioral sciences/clinical psychiatry*. 10th ed. Philadelphia: Wolter Kluwer/Lippincott Williams & Wilkins; 2007.
- Tyrrell CJ, Payne H, Tammela TL, et al. Prophylactic breast irradiation with a single dose of electron beam radiotherapy (10 Gy) significantly reduces the incidence of bicalutamide-induced gynecomastia. *Int J Radiat Oncol Biol Phys*. 2004;60(2):476–483.
- Bautista-Vidal C, Barnoiu O, Garcia-Galisteo E, Gomez-Lechuga P, Baena-Gonzalez V. Treatment of gynecomastia in patients with prostate cancer and androgen deprivation. *Actas Urol Esp*. 2014;38(1):34–40.
- Finzi E, Rosenthal NE. Treatment of depression with onabotulinumtoxinA: a randomized, double-blind, placebo controlled trial. *J Psychiatr Res*. 2014;52:1–6.
- Zamanian A, Ghanbari Jolfaei A, Mehran G, Azizian Z. Efficacy of Botox versus Placebo for Treatment of Patients with Major Depression. *Iran J Public Health*. 2017;46(7):982–984.
- Mohebipour A, Gianfaldoni S, Lotti T, et al. Recycling of Previously Transplanted Hair: A Novel Indication for Follicular Unit Extraction. *Open Access Maced J Med Sci*. 2018;6(6):1095–1097.
- Feily A, Hosseinpoor M, Bakhti A, et al. Digit-Length Ratios (2D:4D) as a Phenotypic Indicator of in Utero Androgen Exposure is Not Prognostic for Androgenic Alopecia: a Descriptive-Analytic Study of 1200 Iranian Men. *Dermatol Reports*. 2016;8(1):6386.
- Feily A, Feily A. Using Feily's method prevented scalp necrosis in three patients incline to the scalp recipient necrosis; what is new in prevention of scalp necrosis? *Dermatol Ther*. 2017;30(1).
- Schmidtberger L, Ladizinski B, Ramirez-Fort MK. Wax on, wax off: pubic hair grooming and potential complications. *JAMA Dermatol*. 2014;150(2):122.

33. Ramirez-Fort MK, Meier B, Feily A, Cooper SL, Lange CS. Adjuvant irradiation to prevent keloidal fibroproliferative growth should be standard of care. *Br J Dermatol*. 2017;177(6):e327–e328.
34. Ramirez-Fort MK, Zeng J, Feily A, et al. Radiotherapy-induced reactivation of neurotrophic human herpes viruses: Overview and management. *J Clin Virol*. 2018;98:18–27.
35. Rassai S, Rafeie E, Ramirez-Fort MK, Feily A. Adjuvant Narrow Band UVB Improves the Efficacy of Oral Azithromycin for the Treatment of Moderate to Severe Inflammatory Facial Acne Vulgaris. *J Cutan Aesthet Surg*. 2014;7(3):151–154.
36. Feily A, Seifi V, Ramirez-Fort MK. Fractional CO2 Laser Pretreatment to Autologous Hair Transplantation and Phototherapy Improves Perifollicular Repigmentation in Refractory Vitiligo: A Randomized, Prospective, Half-Lesion, Comparative Study. *Dermatol Surg*. 2016;42(9):1082–1088.
37. Ramirez-Fort MK, Levin AA, Au SC, Gottlieb AB. Continuous versus intermittent therapy for moderate-to-severe psoriasis. *Clin Exp Rheumatol*. 2013;31(4 Suppl 78):S63–S70.
38. Ramirez-Fort MK, Sam H, Manders EK. Management of cutaneous human papillomavirus infection: surgery. *Curr Probl Dermatol*. 2014;45:186–196.
39. Doan HQ, Ung B, Ramirez-Fort MK, Khan F, Tying SK. Zostavax : a subcutaneous vaccine for the prevention of herpes zoster. *Expert Opin Biol Ther*. 2013;13(10):1467–1477.
40. Varada S, Posnick M, Alessa D, Ramirez-Fort MK. Management of cutaneous human papillomavirus infection in immunocompromised patients. *Curr Probl Dermatol*. 2014;45:197–215.
41. Ramirez-Fort MK, Au SC, Javed SA, Loo DS. Management of cutaneous human papillomavirus infection: pharmacotherapies. *Curr Probl Dermatol*. 2014;45:175–185.
42. Kim SR, Khan F, Ramirez-Fort MK, Downing C, Tying SK. Varicella zoster: an update on current treatment options and future perspectives. *Expert Opin Pharmacother*. 2014;15(1):61–71.
43. Braun IM, Rao SR, Meyer FL, Fedele G. Patterns of psychiatric medication use among nationally representative long-term cancer survivors and controls. *Cancer*. 2015;121(1):132–138.
44. Marin H, Escóbar J. *Clinical psychopharmacology: a practical approach*. New Jersey: World Scientific; 2013.
45. Wittmann D, Northouse L, Foley S, et al. The psychosocial aspects of sexual recovery after prostate cancer treatment. *Int J Impot Res*. 2009;21(2):99–106.
46. Paich K, Dunn R, Skolarus T, et al. Preparing Patients and Partners for Recovery From the Side Effects of Prostate Cancer Surgery: A Group Approach. *Urology*. 2016;88:36–42.
47. Chambers SK, Occhipinti S, Schover L, et al. A randomised controlled trial of a couples-based sexuality intervention for men with localised prostate cancer and their female partners. *Psychooncology*. 2015;24(7):748–756.
48. Wong F, Stewart DE, Dancy J, et al. Men with prostate cancer: influence of psychological factors on informational needs and decision making. *J Psychosom Res*. 2000;49(1):13–19.
49. van Tol-Geerdink JJ, Leer JW, van Lin EN, et al. Offering a treatment choice in the irradiation of prostate cancer leads to better informed and more active patients, without harm to well-being. *Int J Radiat Oncol Biol Phys*. 2008;70(2):442–448.
50. Ramirez-Fort MK, Rogers MJ, Santiago R, et al. Prostatic irradiation-induced sexual dysfunction: a review and multidisciplinary guide to management in the radical radiotherapy era (Part I defining the organ at risk for sexual toxicities). *Rep Pract Oncol Radiother*. 2020;25(3):367–375.
51. Devisser A, Yang C, Herring A, et al. Retraction notice to differential impact of diabetes and hypertension in the brain: Adverse effects in grey matter. *Neurobiol Dis*. 2011;44:161–173, <http://dx.doi.org/10.1016/j.nbd.2011.06.005>.
52. Feily A, Firoozifard A, Sokhandani T, et al. Follicular transplantation, microneedling, and adjuvant narrow-band Ultraviolet-B irradiation is a cost-effective regimen for Palmar-Plantar Vitiligo: A pilot study. *Cureus*. 2020;12(4):e7878, <http://dx.doi.org/10.7759/cureus.787>.