

## Brief Correspondence

# Orgasmic Dysfunction After Robot-assisted Versus Open Radical Prostatectomy

Paolo Capogrosso<sup>a,b,\*</sup>, Eugenio Ventimiglia<sup>a,b</sup>, Alessandro Serino<sup>b</sup>, Armando Stabile<sup>a,b</sup>, Luca Boeri<sup>b</sup>, Giorgio Gandaglia<sup>a,b</sup>, Federico Dehò<sup>b</sup>, Alberto Briganti<sup>a,b,c</sup>, Francesco Montorsi<sup>a,b</sup>, Andrea Salonia<sup>a,b</sup>

<sup>a</sup> Università Vita-Salute San Raffaele, Milan, Italy; <sup>b</sup> Division of Experimental Oncology/Unit of Urology, URI-Urological Research Institute, IRCCS Ospedale San Raffaele, Milan, Italy; <sup>c</sup> Research Doctorate Program in Urology, Magna Graecia University, Catanzaro, Italy

### Article info

#### Article history:

Accepted October 23, 2015

#### Associate Editor:

Christian Gratzke

#### Keywords:

Climacturia  
Painful orgasm  
Robot-assisted radical prostatectomy  
Orgasmic dysfunction

### Abstract

Several alterations of orgasmic function that occur after radical prostatectomy (RP) have never been assessed in robot-assisted RP (RARP) series. We sought to assess the prevalence and predictors of recovery from orgasm-associated incontinence (climacturia) and painful orgasm (PO) after RARP and open RP (ORP). Following surgery, sexually active patients who had undergone either RARP or ORP prospectively completed a 28-item questionnaire including sensitive issues regarding sexual function (eg, climacturia and PO). Rates of postoperative climacturia and PO were compared for RARP and ORP patients. Kaplan-Meier analysis was applied to assess estimated rates of recovery from either climacturia or PO after both procedures. Cox regression models tested predictors of recovery from those conditions. Overall, 221 (29.5%) of 749 patients reported climacturia, without differences between RARP and ORP. Conversely, PO was significantly more frequently reported after ORP than after RARP (46 [11.6%] vs 25 [7.1%] patients, respectively;  $p = 0.04$ ). At Kaplan-Meier analysis, recovery from climacturia over time was faster and greater after RARP than after ORP (8.5% vs 5%, respectively, at 24-mo assessment and 48% vs 15%, respectively, at 84-mo assessment;  $p < 0.01$ ). Conversely, no differences were found between groups in terms of postoperative recovery from PO. At multivariable analysis, only RARP achieved independent predictor status for recovery from climacturia after adjusting for other functional outcomes. Conversely, no variables were significantly associated with recovery from postoperative PO.

**Patient summary:** Orgasmic modifications such as climacturia and painful orgasm (PO) are frequently reported after radical prostatectomy. Robotic surgery was associated with a lower rate of postoperative PO and with greater and faster recovery from climacturia.

© 2015 European Association of Urology. Published by Elsevier B.V. All rights reserved.

\* Corresponding author. Università Vita-Salute San Raffaele, Division of Experimental Oncology/Unit of Urology, URI-Urological Research Institute, IRCCS Ospedale San Raffaele, Via Olgettina 60, 20132 Milan, Italy. Tel. +39 02 26437286; Fax: +39 02 26432969. E-mail address: [paolo.capogrosso@gmail.com](mailto:paolo.capogrosso@gmail.com) (P. Capogrosso).

Patients who have undergone radical prostatectomy (RP) for organ-confined prostate cancer (PCa) may experience postoperative functional impairments, in addition to urinary incontinence (UI) and erectile dysfunction (ED), that have been reported in the literature as “neglected side

effects” [1,2]. Of those, orgasmic function (OF) impairment, including *painful orgasm* (PO; defined as a painful sensation occurring at the time of orgasm [1–3]) and *climacturia* (defined as leakage of urine occurring at orgasm [1,2]), is the most frequently reported in a number of RP series [1–5].

To our knowledge, all data regarding postoperative neglected side effects come from open surgery series, although minimally invasive procedures like robot-assisted radical prostatectomy (RARP) are displacing open RP (ORP) as the gold standard surgical approach [6]. We sought (1) to assess the rates and predictors of climacturia and PO in patients who underwent either ORP or RARP and (2) to analyse any potential intergroup difference in terms of postoperative recovery from both sexual dysfunctions.

In this context, data were prospectively collected from 1023 consecutive patients submitted to either ORP or RARP at a single tertiary referral centre between January 2003 and October 2013. Patients were included if they self-reported as sexually active preoperatively, with normal erectile function (EF) and full urinary continence (UC; defined as no pad use at baseline). After surgery, patients were evaluated in a clinical setting every 3 mo in the first year and every 6 mo thereafter. Over the follow-up period, all patients were invited to complete a nonvalidated 28-item questionnaire with closed questions about sensitive issues regarding sexual function, including specific items on (1) orgasmic function, (2) climacturia, (3) orgasm-related pain, and (4) morphometric characteristics of the penis. For the specific purpose of the study, climacturia was defined as a urinary leakage occurring during orgasm, and PO was defined as a painful sensation occurring at any site at the time of or immediately following orgasm [1]. Patients submitted to either salvage or adjuvant therapies after surgery ( $n = 207$ ; 20.2%); those who refused to complete the questionnaire ( $n = 67$ ; 6.55%) were excluded from the study. Kaplan-Meier curves were applied to assess the impact of surgical technique on recovery from climacturia and PO over time. Univariable and multivariable Cox regression analyses were used to assess the association between predictors and the recovery from either climacturia or PO over time. Comprehensive details of the study methods can be found in Supplement 1.

Overall, 395 patients (52.7%) treated with ORP and 354 patients (47.3%) treated with RARP were included in the analyses (Supplementary Table 1). The groups did not differ in terms of baseline characteristics and postoperative pathologic variables (all  $p > 0.05$ ). Moreover, 221 patients (29.5%) reported postoperative climacturia, with similar proportions in both groups ( $p = 0.1$ ) (Supplementary Table 1). A total of 71 patients (9.5%) reported postoperative PO, with greater prevalence in ORP versus RARP patients ( $p = 0.04$ ). PO was most frequently reported at the level of the penile shaft, followed by the suprapubic area (Supplementary Table 2). Climacturia was reported as occurring at every orgasm by 42 patients (19%) or more than half of the time by 31 patients (14.1%) (Supplementary Table 2). Self-reported volume of orgasm-associated urine leakage was  $\leq 5$  ml in 85.2% of the patients (Supplementary Table 3).

Figure 1a shows estimated rates of recovery from climacturia over time, according to both surgical techniques; RARP patients recovered from climacturia significantly faster than ORP patients ( $p < 0.01$ ). At multivariable Cox regression analysis, only RARP achieved independent predictor status for recovery from climacturia, after

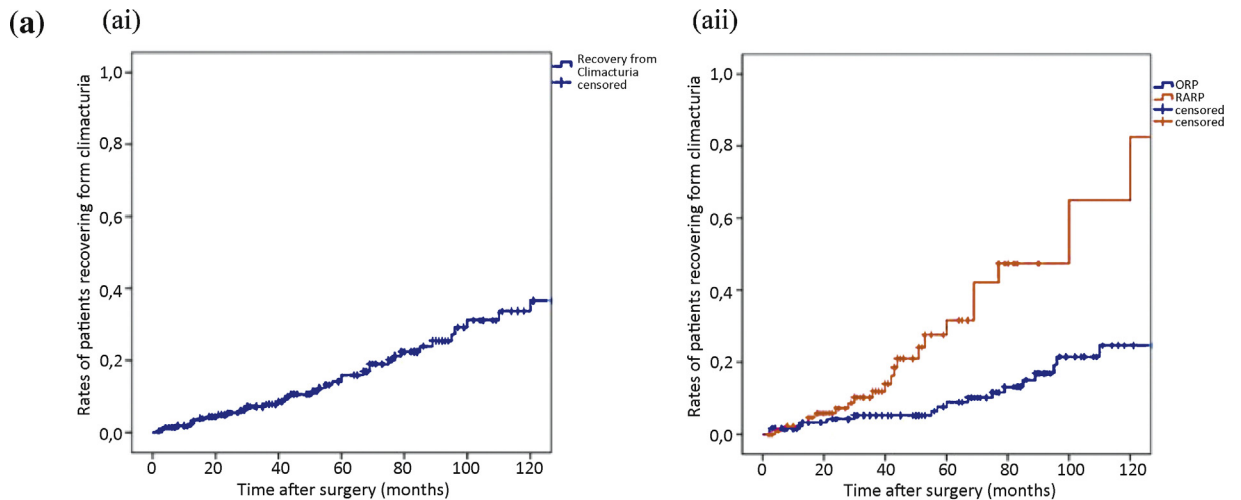
adjusting for age at surgery, nerve-sparing status, EF recovery, and UC recovery (Table 1).

No significant differences were found in terms of estimated rates of recovery from PO over time between groups ( $p = 0.3$ ) (Fig. 1b). No significant predictors emerged as associated with recovery from postoperative PO (Table 1).

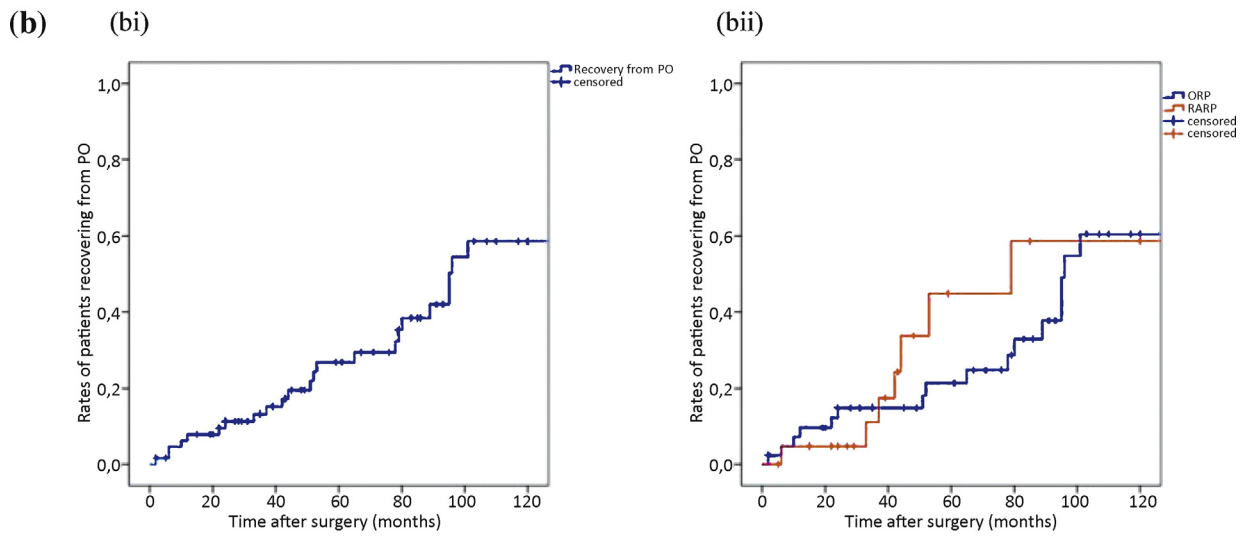
Although postoperative UI and EF impairment have been widely evaluated in several RP series, postoperative OF impairment has been scantily analysed, almost exclusively in ORP series [1–4]. In this regard, climacturia is a postoperative complication affecting OF that may eventually become quite bothersome for the patient, causing embarrassment, avoidance of sexual activity, and relationship problems between partners [4]. The exact rate of climacturia after RP is unknown, with reported rates after surgeries ranging between 20% and 93% [1,2,4,5]. We found that 29.5% of patients self-reported climacturia, confirming previous data. Rates of climacturia were comparable between groups.

UI has been previously associated with the occurrence of climacturia after surgery [7,8] and radiation therapy [8]. These investigations assessed the prevalence of postoperative climacturia in a non-time-dependent fashion. Previous data, however, showed a decreasing prevalence of climacturia at different times after surgery [5]. Consequently, we studied rates of recovery from climacturia over time and found higher rates of recovery after RARP than after ORP. Only robotic surgery achieved independent predictor status for this recovery after accounting for age at surgery, body mass index, nerve-sparing status, and both UC and EF recovery rates.

As for PO, previous studies have reported 14% of patients complaining of orgasm-associated pain after RP [1–3]; our findings showed a self-reported PO rate of 9.5%, with a significantly higher prevalence of PO after ORP than after RARP. Recovery rates of 10% and 30% were reported 12 and 60 mo postoperatively, respectively. No significant predictors of recovery from PO over time have been found, although both UI and EF impairment have been previously associated with orgasmic alterations after surgery [4,7,8]. We believe that the reasons for these findings need to be pursued in the pathophysiology of both climacturia and PO. To the best of our knowledge, only one study has assessed potential pathophysiology pathways behind climacturia, showing that patients with climacturia had significantly shorter functional urethral length compared with controls [9]. Moreover, it has been suggested that surgical damage to the bladder neck and the sympathetic nerves may eventually promote alteration of the ejaculatory physiology [2]; although this is not the case after RP, the underlying functional pathway remains a potential partial explanation of the phenomenon. Similarly, PO has been associated with a spasm of the bladder neck at the site of vesicourethral anastomosis. In this context, significant amelioration of postoperative PO was observed in a series of patients treated with tamsulosin after RP [10]; however, this was not the case for our patients, who had not been treated with any  $\alpha$ -blocker. To date, we can only speculate



Patients recovering from climacturia, % (n)	12 mo	24 mo	84 mo
Overall	2.3 (5)	5.5 (11)	24 (53)
ORP	2.5 (2)	5 (4)	15 (12)
RARP	4 (3)	8.5 (7)	48 (41)



Patients recovering from PO, % (n)	12 mo	24 mo	60 mo
Overall	10 (7)	12.4 (10)	30 (22)
ORP	10 (5)	14.9 (7)	24.8 (11)
RARP	3 (2)	4.2 (3)	48.2 (11)

**Fig. 1 – (a) Kaplan-Meier curves predicting recovery from climacturia (ai) in the overall population and (a)ii) within treatment groups. The log-rank test indicates the statistically significant difference across each group ( $p < 0.01$ ). (b) Kaplan-Meier curves predicting recovery from painful orgasm (bi) in the overall population and (b)ii) within treatment groups. The log-rank test indicates a non-statistically significant difference across each group ( $p = 0.3$ ). ORP = open radical prostatectomy; PO = painful orgasm; RARP = robot-assisted radical prostatectomy.**

that the robotic approach, with a precise surgical technique that allows careful preservation of the bladder neck and longer urethral length and that lacks potential disturbance of the levator ani muscle, may decrease the risk of postoperative PO, with concomitant faster recovery from climacturia.

Our study is not devoid of limitations. First, although postoperative functional outcomes data were collected prospectively, surgical treatment selection (eg, ORP vs RARP) was not prospectively randomised, leading to a potential selection bias and partially undermining the value of these findings, even though baseline characteristics of

**Table 1 – Cox regression analysis assessing predictors of climacturia and painful orgasm after surgery**

	Recovery from climacturia		Recovery from PO	
	UVA, HR (95% CI); p value	MVA, HR (95% CI); p value	UVA, HR (95% CI); p value	MVA, HR (95% CI); p value
Age at surgery	0.97 (0.92–1.02); 0.28	0.97 (0.92–1.02); 0.35	1.01 (0.95–1.08); 0.69	1.07 (0.98–1.16); 0.98
BMI	0.99 (0.88–1.11); 0.94	1.03 (0.92–1.16); 0.55	0.98 (0.83–1.17); 0.89	0.99 (0.82–1.19); 0.94
EF recovery, yes vs no	1.05 (0.56–1.98); 0.86	0.58 (0.26–1.29); 0.18	1.90 (0.83–4.33); 0.12	2.50 (0.88–7.12); 0.08
UC recovery, yes vs no	1.41 (0.68–2.92); 0.35	1.31 (0.60–2.87); 0.48	0.91 (0.36–2.32); 0.85	0.96 (0.29–3.13); 0.96
Type of surgery, ORP vs RARP	4.01 (2.02–7.97); <0.01	4.86 (2.21–10.7); <0.01	1.48 (0.61–3.54); 0.37	0.99 (0.53–5.04); 0.39
Nerve sparing				
None vs unilateral	2.31 (0.81–9.12); 0.97	2.1 (0.62–7.1); 0.97	1.81 (0.21–15.1); 0.96	2.4 (0.23–25.1); 0.96
None vs bilateral	2.71 (0.83–8.82); 0.09	1.81 (0.53–6.21); 0.34	1.90 (0.25–14.3); 0.53	2.31 (0.51–23.2); 0.49

BMI = body mass index; CI = confidence interval; EF = erectile function; HR = hazard ratio; MVA = multivariable analysis; ORP = open radical prostatectomy; PO = painful orgasm; RARP = robot-assisted radical prostatectomy; UC = urinary continence; UVA = univariable analysis.

both groups were comparable. Second, our analyses did not take into account data regarding postoperative medications, such as proerectile compounds, that could have modified both study outcomes; however, neither EF nor continence recovery was significantly associated with either climacturia or PO.

Overall, we reported novel evidence regarding rates of climacturia and PO after RARP per se and in comparison with an ORP group. Current findings suggest that postoperative climacturia affects almost 1 in 3 patients and that PO affects 1 in 10 men after surgery. Despite this significant prevalence, recovery from both conditions is possible even several months following surgery. A significant advantage in terms of a lower prevalence of PO and greater and faster recovery from climacturia was observed in men treated with RARP compared with those who underwent OPR.

**Author contributions:** Paolo Capogrosso had full access to all the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

**Study concept and design:** Capogrosso, Salonia.

**Acquisition of data:** Boeri, Serino, Ventimiglia, Stabile.

**Analysis and interpretation of data:** Capogrosso, Salonia.

**Drafting of the manuscript:** Capogrosso, Salonia.

**Critical revision of the manuscript for important intellectual content:** Briganti, Dehò, Montorsi.

**Statistical analysis:** Capogrosso, Ventimiglia, Gandaglia.

**Obtaining funding:** None.

**Administrative, technical, or material support:** None.

**Supervision:** Salonia, Montorsi.

**Other (specify):** None.

**Financial disclosures:** Paolo Capogrosso certifies that all conflicts of interest, including specific financial interests and relationships and affiliations relevant to the subject matter or materials discussed in the manuscript (eg, employment/affiliation, grants or funding, consultancies, honoraria, stock ownership or options, expert testimony, royalties, or patents filed, received, or pending), are the following: None.

**Funding/Support and role of the sponsor:** None.

**Acknowledgments:** The authors thank Dana Kuefner, PhD, for reviewing the language in this manuscript.

## Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at <http://dx.doi.org/10.1016/j.eururo.2015.10.046>.

## References

- Salonia A, Burnett AL, Graefen M, et al. Prevention and management of postprostatectomy sexual dysfunctions part 2: recovery and preservation of erectile function, sexual desire, and orgasmic function. *Eur Urol* 2012;62:273–86.
- Frey AU, Sonksen J, Fode M. Neglected side effects after radical prostatectomy: a systematic review. *J Sex Med* 2014;11:374–85.
- Barnas JL, Pierpaoli S, Ladd P, et al. The prevalence and nature of orgasmic dysfunction after radical prostatectomy. *BJU Int* 2004;94: 603–5.
- Lee J, Hersey K, Lee CT, Fleshner N. Climacturia following radical prostatectomy: prevalence and risk factors. *J Urol* 2006;176: 2562–5, discussion 2565.
- Choi JM, Nelson CJ, Stasi J, Mulhall JP. Orgasm associated incontinence (climacturia) following radical pelvic surgery: rates of occurrence and predictors. *J Urol* 2007;177:2223–6.
- Heidenreich A, Bastian PJ, Bellmunt J, et al. EAU guidelines on prostate cancer. Part 1: screening, diagnosis, and local treatment with curative intent—update 2013. *Eur Urol* 2014;65:124–37.
- Frey A, Sonksen J, Jakobsen H, Fode M. Prevalence and predicting factors for commonly neglected sexual side effects to radical prostatectomies: results from a cross-sectional questionnaire-based study. *J Sex Med* 2014;11:2318–26.
- O’Neil BB, Presson A, Gannon J, et al. Climacturia after definitive treatment of prostate cancer. *J Urol* 2014;191:159–63.
- Manassero F, Di Paola G, Paperini D, et al. Orgasm-associated incontinence (climacturia) after bladder neck-sparing radical prostatectomy: clinical and video-urodynamic evaluation. *J Sex Med* 2012;9:2150–6.
- Barnas J, Parker M, Guhring P, Mulhall JP. The utility of tamsulosin in the management of orgasm-associated pain: a pilot analysis. *Eur Urol* 2005;47:361–5, discussion 365.