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Evolution of health-related quality of life two to seven years after retropubic radical prostatectomy: evaluation by UCLA prostate cancer index

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Abstract To determine changes in health-related quality of life (HRQOL) in patients treated with retropubic radical prostatectomy (RP) between two and seven years after surgery. A questionnaire from the University of California Los Angeles Prostate Index was sent to 142 patients previously treated with retropubic RP as monotherapy for clinically localized prostate cancer. Patients were divided into five groups according to time from surgery. Demographics, clinical and pathological characteristics of patients were compared between these groups. Correlation coefficients controlled for age at the time of questionnaire between HRQOL scores and time from RP were assessed. A total of 105 patients (74%) returned the questionnaire. The mean time from surgery was 48 months (range 25–84). Demographics, clinical and pathological characteristics of patients were not statistically different between time groups. Several recoding items were found to decrease significantly with the time from RP including physical functioning, role limitations due to physical health problem, vitality, and general health. In contrary, urinary, bowel and sexual scores were not significantly correlated to time from RP. Although sexual, urinary and bowel scores seem to remain stable from 2 to 7 years following RP, general health appears to

significantly deteriorate with time after RP, independent of the patient's age at the time of the questionnaire.

Keywords Long term · Evolution · Quality of life · Prostatic neoplasm · Radical prostatectomy · Questionnaire

Abbreviations RP: Radical Prostatectomy · HRQOL: Health related quality of life · UCLA-PCI: University of California Los Angeles Prostate Cancer Index · OR: Odds Ratio · *r*: Correlation coefficient controlled for age at the time of questionnaire between QOL scores and time from RP

Introduction

Several modalities are available for the treatment of clinically localized prostate cancer; these include radical prostatectomy (RP), external beam radiation, and brachytherapy. Disease-specific survival rates appear to be comparable for radical prostatectomy, external beam radiotherapy and brachytherapy [19].

The predominant goals of treatment remain cancer cure and patient survival. However, when selecting a therapeutic modality, men diagnosed with prostate cancer are greatly influenced by potential treatment-related complications such as urinary incontinence, impotence, or bowel disorders [3].

Health related quality of life (HRQOL) has become an important focus in the last decade [2]. HRQOL may be helpful to propose the most appropriate treatment, especially when several therapeutical options with comparable survival rates exist [1, 22]. The University of California Los Angeles Prostate Cancer Index (UCLA-PCI) is commonly used for the evaluation of prostate cancer treatment modalities [4, 8, 9, 13, 14, 16, 18, 22], evaluating the patient's response to generic measures such as subjective assessment of physical health, bodily pain, or mental state, and the response to the present

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situation of urinary function, bowel habits, and sexual function.

Duration from treatment to HRQOL measure has been shown to influence HRQOL during the first two years following RP. In a longitudinal study, Litwin et al. [18] found that urinary function improves with time during the first year after RP but remains fairly constant during the year after. HRQOL evolution above 2 years has not yet been assessed. Because HRQOL is inversely associated with age, a control for patient's age at the time of the questionnaire is required when analyzing evolution of HRQOL after RP [17].

The goal of the study was to determine whether HRQOL changes over time between 2 and 7 years after retropubic RP using the self-administered UCLA-PCI, independent of the patient's age at the time of the questionnaire.

Materials and methods

From January 1997 to January 2001, 197 patients underwent retropubic RP for clinically localized prostate cancer. One hundred and forty two had not received adjuvant therapy for prostate cancer. All these surgeries were performed by the same surgeon according to the same surgical technique. After an interval of 2–7 years following the intervention, a HRQOL questionnaire was sent by mail to the 142 patients who had not received adjuvant therapy. The questionnaire was based on the French translation of the UCLA-PCI [4, 15]. The original English version and its author's instructions are available for the number on the internet. It contains generic and disease specific measures. The Medical Outcomes Study 36-Item Short Form (SF-36) [13] representing the generic measures is a HRQOL measure designed for use with both the general population and a wide range of populations with chronic diseases. The items are divided into eight sections: physical functioning, role-physical, role-emotional, bodily pain, general health, vitality, social functioning, and mental health. After linear transformation, scores range from 0 to 100, with higher values indicating better levels of functioning.

The UCLA PCI was originally developed by Litwin et al. [16]. It includes six scales, which assess the degree of urinary, sexual, and bowel functions and bother. As with the SF-36 form, all scores were linearly transformed and ranged from 0 to 100. A score of 100 indicated the best level of functioning. Apart from generic and disease-specific HRQOL measures, the questionnaire contained items on background characteristics, such as age and marital status. In addition to the original version, an item assessing the overall patient satisfaction related to RP as treatment option for prostate cancer was included.

Patient age at the time of RP, patient age at the time this study was undertaken, pathological tumor stage and grade, and preoperative PSA levels were also collected from patient medical records.

Patients were divided into five time groups, 2–2.5 years from surgery (T2), 2.5–3 years after RP (T2.5), 3–4 years after RP (T3), 4–5 years after RP (T4), and 5–7 years after RP (T5+). Demographic characteristics of patients as well as clinical and pathological features were compared between time groups using ANOVA test. Then, HRQOL mean scores were assessed for each time group. Correlation coefficients controlled for age at the time of the questionnaire between exact time from RP and scores of recoded items were assessed. Commercially available software was used for all analysis (SPSS inc., Chicago, IL, USA).

Results

Of the 142 patients, 105 (74%) completed the questionnaire and returned it by mail. Three patients who had undergone additional surgery from RP or who had major co-morbidity were excluded. Ninety eight percentage of questions appropriately were answered. Patient demographics for each time group as well as their clinical, pathological, and sociological characteristics are listed in Table 1.

Mean patient age was 63.8 year at the time of RP (range 48–73), and 67.7 year when completing the questionnaire (range 53–75). The mean interval between RP and HRQOL assessment was 48 months. Gleason scores ranged from 4 to 8 with a mean value of 6.5. Of 102 patients, 67 (66%) had stage pT2 disease and 35 (34%) stage pT3. The vast majority of patients were in a relationship (90/102, or 89%) and only a small fraction were or had been cigarette smokers (14/102, or 14%).

Regarding demographic, clinical and pathological characteristics, no significant difference was found between time groups (Table 1). In particular, mean age of patients at the time of questionnaire ranges from 66.9 to 68.6 years ($P=0.9$). Similarly, no significant difference was found regarding pathological stage and Gleason score ($P=0.6$ and $P=0.07$ respectively).

The questionnaires were recoded according to the instructions of the original authors to obtain general or disease-specific health-related quality of life scores ranging from 0 to 100. Tables 2 and 3 show the results in the overall group and in each time group for SF-36 items and UCLA-PCI items, respectively.

Considering the overall group generic HRQOL, the best scores were recorded for physical functioning (85.6), bodily pain (87.2), and role limitations due to emotional problems (86.6). By contrast, the worst scores were given to health transition (46.1), general health (72.3), and vitality (72.4). In the disease-specific section of the questionnaire, average scores of function were associated with the average scores of complaints: the best scores were given to bowel function (81.9) and bowel bother (84.6), followed by urinary bother (72.5) and urinary function (67.8). Sexual function (27.5) and sex-

Table 1 Clinical, pathological, and sociological characteristics of 102 patients for each time group, and *P* values of differences between groups (ANOVA test)

Characteristics	T2	T2.5	T3	T4	T5+	Overall	<i>P</i>
Number of patients	17	23	23	16	23	102	
Mean age at the time of RP (year)	64.8	64.2	65.1	63.0	61.6	63.8 [48–73]	<i>P</i> =0.2
Time from RP (months)	24–30	30–36	36–48	48–60	60–84	48	
Mean age at the time of questionnaire	67.1	66.9	68.6	67.6	68.1	67.7	<i>p</i> =0.9
Pathological stage pT2	12	17	14	10	14	67 (66%)	<i>P</i> =0.6
Pathological stage pT3	5	6	9	6	9	35 (34%)	
Pathological Gleason score	6.3	6.2	6.4	6.7	6.8	6.5 [4–8]	<i>P</i> =0.07
Living with spouse or partner in a significant relationship, but living alone	15	20	19	16	20	90 (90.9%)	<i>P</i> =0.6
Not in a significant relationship	1	2	2	0	1	6 (6.1%)	
Current or past cigarette smoker	1	0	1	0	1	3 (3%)	
	3	4	3	3	1	14 (13.7%)	<i>P</i> =0.6

[Minimum–maximum]

Table 2 Generic HRQOL

	N	T2	T2.5	T3	T4	T5+	Overall	<i>r</i>	<i>P</i>
Physical functioning	97	94	91	84	85	75	85.6	−0.41	<0.001
Role limitations due to physical health problems	102	87	86	74	80	65	77.7	−0.25	0.012
Role limitations due to emotional problems	102	97	87	80	85	88	86.6	−0.03	0.78
Vitality	100	79	74	69	75	67	72.4	−0.24	0.017
Mental health	98	84	79	74	79	79	78.6	−0.05	0.5
Social functioning	101	86	80	78	81	80	80.7	−0.047	0.65
Bodily pain	100	91	87	89	84	85	87.2	−0.17	0.1
General health	96	78	76	70	71	68	72.3	−0.23	0.025
Health transition	96	43	43	50	47	47	46.1	−0.09	0.3

Average recoding item scores for each time group and overall, and correlation coefficients controlled for age between each item score and time from RP (*r*)*N* number of responders; *P*, *P* value

Table 3 Disease-specific HRQOL

	N	T2	T2.5	T3	T4	T5+	Overall	<i>r</i>	<i>P</i>
Urinary function	102	70	73	66	62	65	67.8	−0.1	0.3
Urinary bother	100	76	75	81	62	65	72.5	−0.18	0.08
Bowel function	102	85	87	79	79	79	81.9	−0.16	0.12
Bowel bother	102	93	92	79	78	80	84.6	−0.15	0.13
Sexual function	100	24	37	22	27	25	27.5	0.01	0.9
Sexual bother	99	18	41	23	23	21	25.5	−0.1	0.3

ual bother (25.5) were the sections with the least scores. In summary, the highest satisfaction was achieved with regard the bowel function, intermediate with regard to the urinary function and the lowest with regard to the sexual function.

Mean HRQOL scores of each time group are presented in Table 2 and Fig. 1 for generic measures, and in Table 3, Figs. 2 and 3 for disease, specific items.

Several recoding items were found to decrease significantly with the time from RP independent of patient's age at the time of questionnaire (Table 2, Fig. 1), including physical functioning ($r = -0.41$, $P < 0.001$), role limitations due to physical health problem ($r = -0.25$, $P = 0.012$), vitality ($r = -0.24$, $P = 0.017$), and general health ($r = -0.23$, $P = 0.025$). The others generic recoding items including role limitation due to emotional problems, mental health, social functioning, bodily pain, and health transition were not significantly different in each time group (Table 2, Fig. 2). Correlation coefficients controlled for age between urinary, bowel and sexual scores and time from RP were not significant (Table 3, Fig. 3).

The overall satisfaction rate was assessed with a separate question in the questionnaire. Thirty-two percent of patients were stated were very satisfied and 42.2% to be satisfied. Only 4% of patients were not satisfied and 3% were not at all satisfied. No significant correlation was found between the overall satisfaction and the time from RP ($r = -0.07$, $P = 0.5$, data not shown).

Discussion

The aim of this study was to assess the impact of retroperic radical prostatectomy (RP) on the quality of life of patients between two and seven years from surgery using a previously peer reviewed standardized questionnaire [4, 8, 9, 13, 14, 16, 18, 22]. Because quality of life is known to be inversely associated with age, the results reported here were controlled for age of patients at the time of the questionnaire.

To analyze HRQOL following prostate cancer, characteristics of patient populations have to be taken

Fig. 1 Generic items of which average scores significantly decrease over time following RP. Scores for physical functioning, limitations due to physical problems, vitality, bodily pain, and general health, all decreased over time after RP

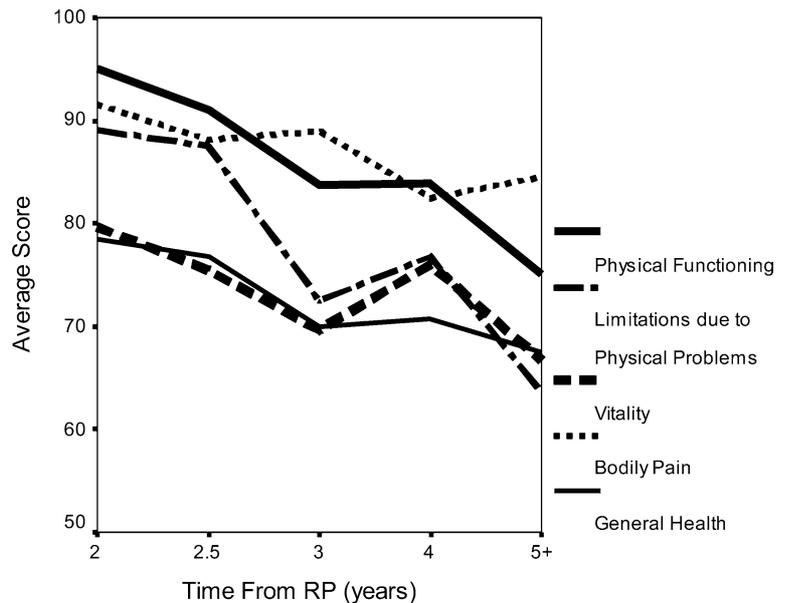
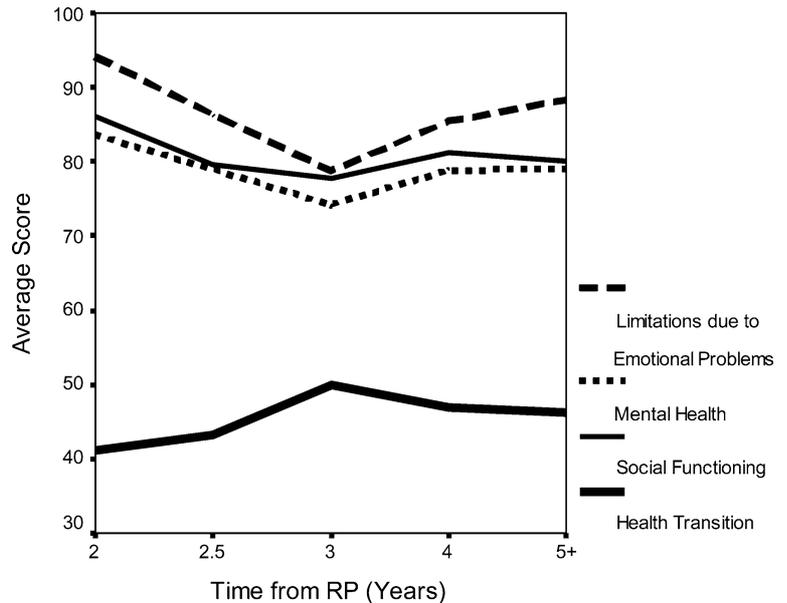


Fig. 2 Generic items of which average scores do not significantly change over time following RP. No significant changes in scores assessing limitations due to emotional problems, mental health, social functioning, or health transition were observed

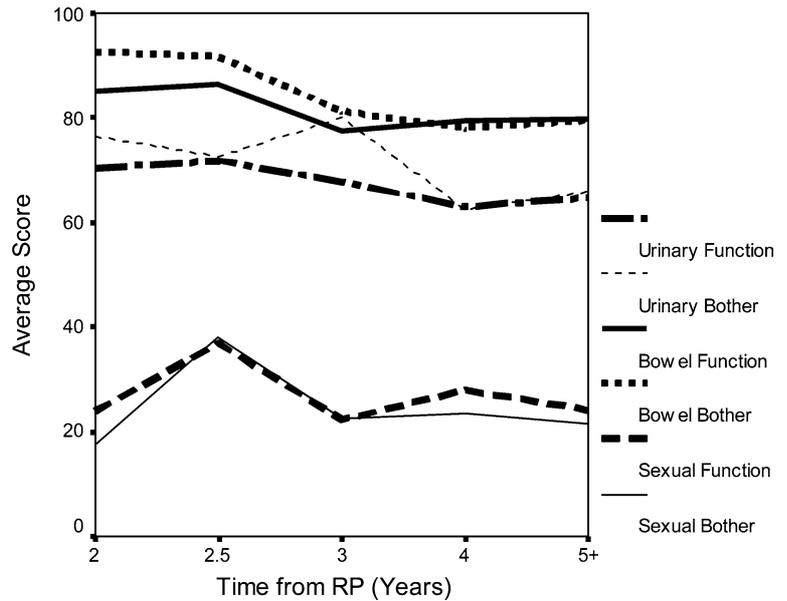


into account. In a multivariate analysis, Hu et al. observed that the patients younger than 65 years were more likely to return to baseline urinary [Odds Ratio (OR) 1.8, $P=0.01$], sexual (OR 2.5, $P=0.01$) and physical health (OR 1.8, $P=0.03$) after RP. Conversely, in the same study, clinical T stage, PSA and Gleason score did not predict return to baseline HRQOL after RP. In a study of Cooperberg et al., sexual function following RP was inversely associated with age. As demographic, clinical and pathological data did not differ significantly between groups, we assumed that the five time groups were comparable. In particular, mean age of responders between groups only ranged from 67.1 to 68.6 years old. In addition, correlation coefficients between HRQOL scores and time from RP were con-

trolled for age at the time of questionnaire. The fact that all patients were operated by the same surgeon according to the same technique also enhances the comparability between groups.

Sexual, urinary and bowel scores seem to remain stable between 2 and 7 years following RP. Similarly, scores related to psychological field including mental health, emotional problems, and social functioning did not significantly change among time groups. In contrary, we found several items related to general and physical health where scores deteriorate over time after RP. These findings might have an impact on patients when selecting prostate cancer treatment modality. To our knowledge, no previous study has reached such conclusions. However, the major limitation of our study is

Fig. 3 Evolution over time following rp of scores related to disease specific items. Scores of parameters related to disease specific quality of life following radical prostatectomy such as urinary, bowel and sexual function or bother did not change over time after prostatectomy



not to compare HRQOL scores with baseline status. Additional long term longitudinal study might be required to validate these observations [23].

Regarding overall scores of the present study, preservation of general health, urinary continence and bowel function were satisfactorily achieved in the majority of patients. By contrast, erectile dysfunction had a strong impact on the patient's quality of life and remained the sole aspect of discontent with RP as treatment approach. Radical retropubic prostatectomy leads to a high overall satisfaction rate in patients. Only 6.8% of patients were not satisfied, whereas 32.4 and 42.2% of responders were very satisfied and satisfied, respectively. These findings suggest that despite sexual and urinary after effects, retropubic RP is well accepted as a treatment of prostate cancer. Similarly, in Augustin et al. study and Braslis et al. study, both of which assessed the quality of life following RP, authors reported that 82% and 90 % of responders, respectively, would vote for surgery again [6, 7].

Self-administered questionnaires may represent the best method to accurately assess post-treatment quality of life, avoiding bias on the side of the investigator during data collection and thus maintain reproducibility among patients. In the field of prostate cancer, an abundance of clinical studies have used the UCLA-PCI as the HRQOL questionnaire, after the reliability and validity of this questionnaire have been widely documented [9, 16, 22]. In addition, The UCLA-PCI is modestly affected by cultural differences when administered to culturally distinct, English-speaking men or when translated into French [15]. Consequently, this is an internationally standardized tool that can be used to compare results reported in the literature for any prostate cancer treatment modality, including surgery, external beam radiation and brachytherapy.

In our study, RP was performed using a retropubic approach. Although laparoscopic intervention has now

become a realistic alternative [5, 10, 11, 20, 21], clinical outcomes of cancer control, complications, postoperative urinary status and sexual function appear not to be significantly better than those of open surgery. To our knowledge, only Hara et al. [12] have compared HRQOL after retropubic versus laparoscopic RP. Although they observed that quality of life was affected after RP in both techniques, they found the changes to be similar. The only difference between the procedures was a significantly more favorable attitude toward surgery displayed by the patients treated with laparoscopic RP.

Conclusions

This study analyzes the evolution of HRQOL between 2 and 7 years following retropubic RP using a validated self-administered questionnaire. Although sexual, urinary and bowel scores seem to remain stable from 2 to 7 years following RP, general health appears to significantly deteriorate with time after RP, independent of the patient's age at the time of questionnaire.

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