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Assessment of quality of life in patients surgically treated for penile cancer: Impact of aggressiveness in surgery

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ABSTRACT

Purpose: Health-related quality of life (HRQoL) evaluations are being increasingly used for clinical assessment of cancer treatment outcomes. For a patient, not only is life expectancy important, but also a general sense of sustained global health. Intuitively, the more disfiguring the treatment, the more pronounced could be the deterioration in the QoL. We aimed to compare various aspects of QoL in three groups of patients surgically treated for penile cancer by local excision, partial penectomy, or total penectomy.

Methods: HRQoL was assessed in 51 patients surgically treated for penile cancer. Total penectomy, partial penectomy, or wide local excision was performed in 11, 27, and 13 patients, respectively. The EORTC QLQ-C30 questionnaire was used for HRQoL assessment. Relations between the patients and their partners were also assessed.

Results: Statistically significant negative correlation was found between aggressiveness of the surgical procedure and both, assessment of global health status ($p = 0.04$) and physical functioning ($p = 0.047$). The more aggressive the surgery, the lower was the patients' assessment of their QoL. Among the patients who maintained their partner relations postsurgery, 58.9% declared that their relations postoperatively were not inferior compared to those preoperatively. There was no statistically significant effect of the surgery type on relations with female partners ($p = 0.619$).

Conclusion: The magnitude of disfigurement caused by surgical treatment of penile cancer had a significant impact on the selected QoL domains assessed by the EORTC QLQ C-30 questionnaire. There was no correlation between the scope of surgical intervention and partner relations.

1. Introduction

Penile cancer is a rare malignancy. In 2010, there were 232 de novo cases (Barnholtz-Sloan et al., 2007) of and 89 deaths due to penile cancer in Poland (Wojciechowska and Didkowska, 2013). These figures are similar to those from other Western European countries, but were significantly lower than those observed in Africa, South America, and Asia (Barnholtz-Sloan et al., 2007; Parkin et al., 2010; Christodoulidou et al., 2015).

Surgery is the standard treatment applied in penile cancer, although less invasive methods have also been used in precancerous conditions or in the early stages of malignancy (Pizzocaro et al., 2010; Van Poppel et al., 2013). Surgical treatment involves resection of the primary lesion, partial or total penectomy with or without inguinal lymphadenectomy, depending on the clinical indications or histopathological status of the primary lesion (Shabbir et al., 2014; Protzel and Hakenberg, 2013). Two centimeters of healthy tissue is considered to represent a safe margin, although there is no clear consensus on this, and a recent report (Korets et al., 2007) has indicated that a < 1-cm margin may be acceptable in case of partial

Abbreviations: HRQoL, Health-related quality of life; QoL, Quality of life; EORTC, European organization for research and treatment of cancer.

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penectomy.

Intuitively, surgical treatment of penile cancer should be the least destructive, with the least possible detrimental effect on quality of life (QoL) (Zukiwskyj et al., 2013; Antunes et al., 2007; Ficarra et al., 2000). However, there is limited support for this notion. Most scientific analyses have been based on small groups of patients, and usually focused on a single surgical method, and is retrospective in nature (Hakenberg et al., 2015). Assessments of the effects of surgical treatment are usually related to single domains of QoL, and the variety of tools used in those assessments makes comparison of their results impossible (Maddineni et al., 2009; Branney et al., 2013a, b). In addition, engaging male patients with penile cancer in a study assessing their QoL raises practical, methodological, ethical, and emotional challenges for the researchers, and they need to be properly equipped for this task (Witty et al., 2014).

The aim of our study was to investigate whether there are differences in the various dimensions of QoL, or in partner relations of patients undergoing surgery of various levels of aggressiveness (local excision, partial penectomy, total penectomy).

2. Patients and methods

Patients who were surgically treated for a suspicious penile lesion between June 2007 and June 2013 were enrolled. The study was approved by the local Bioethics Committee (approval number KB-411-3-13). All patients provided written informed consent for participation and access to personal data prior to the start of the study. All patients received and returned anonymous questionnaires by mail.

Patients were stratified according to the level of aggressiveness of the surgical procedure: group 1—circumcision or wide local resection (low aggressiveness of the surgical procedure); group 2—partial penectomy (medium level of aggressiveness); group 3—total penectomy with perineal urethrotomy (high level of aggressiveness).

All surgical procedures were performed by a group of 4 experienced urologists. Simultaneous bilateral inguinal lymphadenectomy did not disqualify subjects from participation in the study.

2.1. Research tools

The EORTC QLQ-C30 questionnaire developed by the European Organization for Research and Treatment of Cancer (EORTC)—version QLQ C-30 v3.0 (Polish version available from the EORTC website) was used for global assessment of QoL (Aaronson et al., 1993). The questionnaire consists of 30 questions grouped into five sub-scales reflecting global health status, physical functioning, role functioning, emotional functioning, cognitive functioning, and social functioning. Questions regarding the global QoL and health are scored from 1 to 7 (where 1 represents very poor and 7 represents excellent health conditions and QoL). The remaining questions of the questionnaire are scored from 1 to 4 (never, sometimes, often, and very often). A respondent chooses one answer to each question. The lower the total score, the higher the QoL assessment.

Moreover, study participants provided their assessment of their partner relations by choosing one option to describe the status of their relationship after the surgery as follows: the same as before the surgery, or inferior or superior to the pre-surgical status.

2.2. Statistical methods

Spearman's non-parametric correlation (rho) test and the chi-squared test were applied to determine the correlation between the aggressiveness of the surgical procedure and QoL and the quality of partner relations.

3. Results

Fifteen of 81 patients who were surgically treated died during the period of analysis. QoL questionnaires were sent to the remaining 66 patients in June to July 2014. Of that group, 5 patients contacted the researcher to declare their decision not to participate in the study. Ten patients provided no response, despite repeated contact by mail. Finally, 51 patients (71% of responses) qualified for further analysis. The patients' mean age was 60 years (range: 28–83 years). The mean lapse of time between the surgery and the time of the study was 36.3 months (range: 14–83 years). Surgical treatment was the basic therapeutic method applied in all patients. Total penectomy with perineal urethrotomy was performed in 21.6% of patients, and partial penectomy in 52.9%. All patients declared a heterosexual orientation. Table 1 presents the social and geographical data.

The level of global QoL and levels of other domains of QLQ C-30 in relation to the aggressiveness of surgery are presented in Table 2. In order to better understand the influence of penile surgery on QoL, data from the present study have been shown alongside the results generated for certain selected populations (general population, patients with genito-urinary cancer, and all male patients with cancer) in the EORTC reference study (Scott et al., 2008). Statistically significant negative correlation was found between the aggressiveness of the surgery and the global health status (rho = -0.3; $p < 0.05$), and between the aggressiveness of the surgery and the physical functioning (rho = -0.3; $p < 0.05$) (Table 3). These results indicate that the more aggressive the surgery, the lower the patients' assessment of their global QoL and physical functioning was.

Among all the cases where patients maintained their partner relations after the surgery, 58.9% declared that their relations were not inferior to before the surgery (1 patient declared an improvement in his partner relations). The type of surgery did not have an effect on patients' relations with their partners ($p > 0.05$).

4. Discussion

The clinical stage, histology, localization of the tumor, and anatomy of the sexual organs are the main elements affecting the decision on the scope of penile surgery (Hakenberg et al., 2015; Maddineni et al., 2009; Scott et al., 2008). The preferences of the patient, and an attempt at minimum disfigurement even if associated with a higher risk of local recurrence, should always be considered while selecting the final method of treatment (Mydlo, 2011; Sosnowski et al., 2016; Jakobsen, 2015; Sedigh et al., 2015). In a previous study, 7 of 25 men treated for penile cancer declared after treatment that they would have preferred a scheme of treatment associated with lower long-term survival, but with a higher QoL (Opjordsmoen and Fossa, 1994). Results of numerous studies indicate that patients' QoL is associated with the level of disfigurement caused by a therapeutic procedure (Hakenberg et al., 2015; Opjordsmoen and Fossa, 1994; Kieffer et al., 2014; Mortensen and Jakobsen, 2013; D'Ancona et al., 1997).

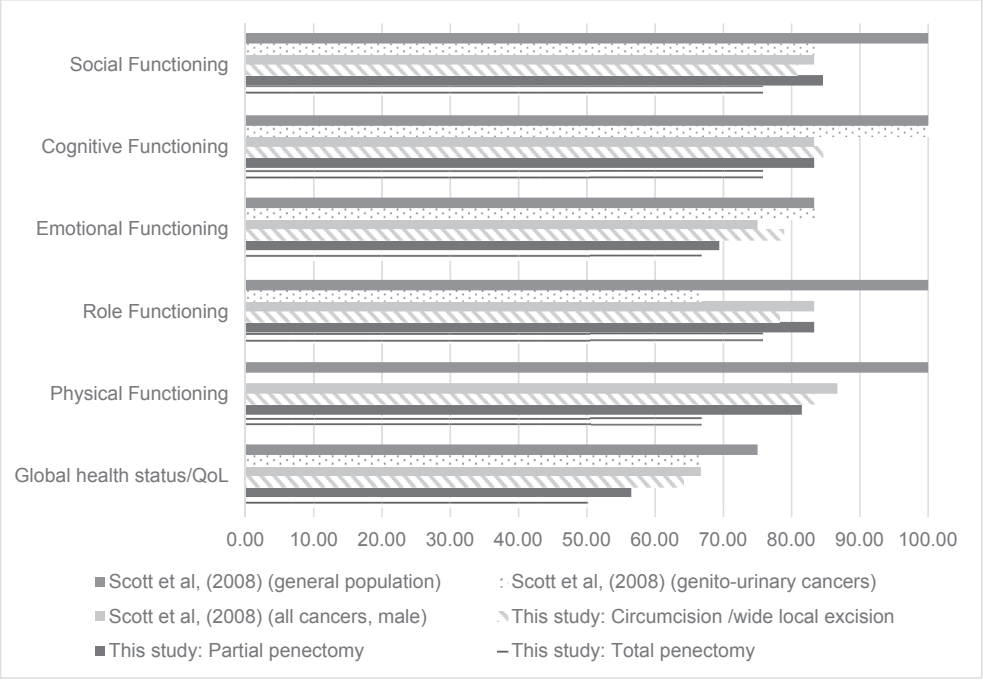
In the present study, we found significant negative association between the global QoL, physical functioning, and the level of disfigurement caused by a surgical procedure ($p < 0.05$ and $p < 0.04$, respectively). No similar association was observed for other domains. Patients with low or intermediate education comprised a significant part of the study group with nearly half of the subjects lived in rural areas or in small towns. This may be associated with strong stereotypes of manhood, the role of males in

Table 1
Social and demographic data and the assessment of partner relations.

	Total penectomy (n = 11, 21.6%)	Partial penectomy (n = 27, 52.9%)	Circumcision/wide local excision (n = 13, 25.5%)	Total (n = 51, 100%)
Age (mean/SD)	63.8 (10.6)	66.3 (11.5)	54.9 (13.6)	62.9 (12.6)
Education (N)				
1. Elementary	2	2	0	4 (7.8%)
2. Vocational	4	11	3	18 (35.3%)
3. Secondary	2	10	4	16 (31.4%)
4. Tertiary	3	4	6	13 (25.5%)
Residence (N)				
1. Village	2	7	0	9 (17.7%)
2. Small town	2	7	4	13 (25.5%)
3. Large city	7	13	9	29 (56.9%)
Partner relations (N)				
1. The same	5	18	6	29 (56.9%)
2. Inferior	2	3	2	7 (13.7%)
3. Improved	0	0	1	1 (2%)
4. Not applicable	4	6	4	14 (27.5%)

Mean—arithmetic mean; SD—standard deviation.

Table 2
Median values for sub-scales of the QLQ C-30 questionnaire after a particular type of surgical intervention, along with reference values from the EORTC Quality of Life Group. Higher the score, better the quality of life.



All scales and single-item measurement range in score from 0 to 100.

All scales and single-item measurement range in score from 0 to 100.

partner relations, and self-assessment dependent on meeting cultural standards while living in a small local society and this may thus have had an impact on the results obtained.

Opjordsmoen et al. (1994) defined global well-being as the result of the assessment of internal tension, happiness, and satisfaction with life, mood, and vitality, using, among others, the EORTC QLQ C-30 questionnaire in patients subjected to various types of treatment for penile cancer, including partial and total penectomy (Opjordsmoen and Fossa, 1994). Their results indicated that the more radical treatments had the greatest impact on the patients' sexual life. However, the treatment itself was not related to the overall well-being or to social contact and activity. Surgical treatment may make some male patients fearful of the fact that due to the anatomical location of their tumor or the consequences of treatment, they may become the subject of ridicule (Branney et al., 2014).

Kieffer et al. (2014) using the SF-36 questionnaire for the assessment of QoL, observed no statistically significant difference between penile-sparing surgery and partial penectomy in terms of SF-36 scores. Men who underwent partial penectomy had significantly more appearance concerns ($p = 0.008$) and they reported more life interference ($p = 0.032$). However, as assessed by the SF-36, the health-related quality of life (HRQoL) in their sample was generally similar to that in an age-matched normative sample of

Table 3
Spearman correlations between the level of aggressiveness of the surgery (circumcision/wide local excision, partial penectomy, total penectomy) and questionnaire results for global health status and 5 sub-scales of functioning EORTC QLQ C-30.

	Spearman correlation	*p*
1. Global health status	−0.3	0.04*
2. Physical functioning	−0.3	0.047*
3. Role functioning	−0.1	0.4
4. Emotional functioning	−0.2	0.12
5. Cognitive functioning	0	0.91
6. Social functioning	−0.3	0.06†

† $p < 0.1$; * $p < 0.05$.

men from the general Dutch population. In fact, patients with penile cancer scored significantly better on the higher order physical component scale ($p = 0.044$) and on the bodily pain subscale ($p < 0.001$) than did their general population peers (Kieffer et al., 2014).

Similarly, paradoxical results were obtained in other studies, indicating that surgically treated and recurrence-free patients often reported a high HRQoL level, similar to or even higher than that reported by healthy individuals (Rapkin and Schwartz, 2004; Skeppner et al., 2008). The available literature offers no explanation for such results; it is possible that such results are a consequence of mechanisms of dealing with malignancy and the patients' gratitude for being cured of cancer (Opjordsmoen et al., 1994). They may also be associated with the fact that the function of the lower urinary tract remains unaffected for example, there was no difference in passing urine after the surgery between the control group and the treated group (Bullen et al., 2010). Another explanation may be that the generally positive results of the HRQoL and the problems resulting from the diagnosed malignancy partially reflects the fact that the majority of men received support from their partners (mostly spouses), which could significantly improve the course of convalescence.

Social support plays an important role in the functioning of surgically treated patients. In this study, the majority of men declared that their partner relations were non-inferior after surgery (Table 2). There were no statistically significant effects of the extent of surgery on patients' relations with female partners ($p = 0.67$). Acceptance of the disability, caused by the surgical treatment improved partner-to-partner relations based on acceptance of the partner's physical status, despite the damage caused by the penectomy, and providing support in difficult and stressful situations, could have influenced the study results (Branney et al., 2011, Branney et al., 2013a,b). This should be investigated in further studies on a larger group of patients. Other reports have indicated that good partner-to-partner relations constitute a significant source of social support and improve the effectiveness of rehabilitation (Bullen et al., 2010). The assessment of mental health and social activity made by D'Ancona et al. (1997) confirmed that patients report concerns regarding disfigurement and loss of sexual experience, as well as fear of death and its impact on their families. On the other hand, patients' families and partners played an important, supportive role and provided much help with dealing with those concerns. The study by Bullen et al. (2010) concluded that wives or female partners play a dominant role in support. Results suggest that effective rehabilitation is possible in cases where the men received strong support, presenting an altered masculine role. Physicians must ensure that men are well-informed about the extent and potential consequences of their treatment is a key area for development (Witty et al., 2013).

Some limitations of this study should be noted. Not all men chose to participate in the study. Thus, the respondents may have involved those whose functioning was non-inferior and/or those whose self-assessment of their health and sexual functioning was more optimistic than that of others. Although the size of the sample was relatively large, compared to other studies, it was still insufficient for a more detailed analysis of sub-groups. The size of individual groups of subjects was not equal, and the group of patients who had undergone a total penectomy was the smallest. Patients' responses may to some extent reflect a need for social approval, which may indicate a tendency for not admitting to less desirable traits, or expressing gratitude to doctors for the treatment. Considering the cross-sectional and retrospective nature of the study, we could not assess individual changes in relation to time, particularly in comparison to the pre-surgical period. The use of a single question for the assessment of partner relations could be another limitation. Despite those methodology-associated limitations, the study constitutes an important contribution to the understanding of the subject. It is also one of few studies linking the type and extent of surgery with a broad scope HRQoL analysis using the QLQ C-30.

In future studies, particular attention should be paid to the statistically significant negative effect of disfigurement observed only in selected domains of the QLQ C-30 questionnaire. The role played by female partners and determination of the factors that caused the absence of a negative effect of the surgery on partner-to-partner relations should be further explored. It would be interesting to determine how patients dealt with the serious aspect of loss of manhood, and to assess whether they may have overcompensated for this by declarations of a high QoL.

5. Conclusion

Harm caused by surgical treatment for penile cancer has a negative impact on the QoL measured by means of the EORTC QLQ C-30 questionnaire. A negative correlation was observed between the global QoL and physical functioning. The absence of an interrelation between the type of surgery and partner relations is an important finding. Reasons for these findings require further studies. Considering such correlations, it is important to offer appropriate support to the patients. Further studies on this subject are required to minimize the negative mental consequences of surgical treatment for penile cancer.

Finally, in addition to the supportive role of research physicians, men with penile cancer should be encouraged to undergo frequent examinations in order to identify early warning signs that would aid in the diagnosis of their ‘personal’ cancer and other urological dysfunctions (Branney et al., 2015).

6. Clinical practice points

Most urologists consider that total or partial amputation of the penis is one of the most debilitating procedures, with clear adverse effects on the patient's quality of life, particularly the patient's sex-life. Data available in the medical literature to substantiate such predictions is scarce, making it difficult to draw firm conclusions. The health-related quality of life (HRQoL) is increasingly used for the assessment of outcomes of modern oncological and urological treatments. The goal of our study was to investigate whether there were differences in the various dimensions of QoL detected by the EORTC QLQ C-30, and in partner relations of patients undergoing surgery for penile cancer, e.g., local excision, or partial or total penectomy. We found only a few negative correlations: the more aggressive the surgical procedure, the greater the detrimental effect on global health status and on physical functioning. There was no negative correlation between the scope of surgical intervention and partner relations. This study is one of the very few studies

focusing on HRQoL of penile cancer patients who were treated surgically. The results of this study should be taken into consideration for penile cancer patients for whom surgery is scheduled. Additional longitudinal studies are warranted to evaluate individual changes over time in terms of these outcomes.

Conflict of interest

None.

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