Bilateral Subcapsular Orchiectomy versus Bilateral Total Orchiectomy: Comparison of the Quality of Life Post-Orchiectomy

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Abstract

Objective: Bilateral subcapsular orchiectomy (BSO) is said to be more aesthetic and psychologically satisfying when compared to bilateral total orchiectomy (BTO). This study compared the quality of life (QoL) of men with advanced prostate cancer who had BTO to those who had BSO, with an emphasis on their perception of self or identity as a man. Subjects and Methods: Sixty-one patients with advanced prostate cancer opting for bilateral orchiectomy were recruited. Pre-orchiectomy and at 1 month and 3 months post-orchiectomy, the Functional Assessment of Cancer Therapy for Prostate cancer (FACT-P) questionnaires were administered and scored. Results: Thirty (49.18%) patients had BTO (BTO group), while 31 (50.82%) patients had BSO (BSO group) for advanced prostate cancer. On comparison of the two groups, there were no statistically significant differences in FACT-P scores at 1 month and 3 months. The subscale scores also showed no significant statistical difference except for the physical well-being score at 3 months post-orchiectomy, which was lower in the BSO group (P = 0.041). The average scores of Item P5 (I am able to feel like a man) which were used to assess the sex-role identity declined on an average over 3 months with no statistically significant difference on comparison of the two groups. Conclusion: The QoL scores (FACT-P and FACT-G) assessed over 3 months post-orchiectomy did not differ on comparison of the BTO group and the BSO group. Performing a BSO in our region did not result in any psychological benefit when compared to performing a BTO.

Keywords: Bilateral subcapsular orchiectomy, bilateral total orchiectomy, prostate cancer, quality of life

INTRODUCTION

The silent burden of prostate cancer in Africa and Nigeria, in particular, has been emphasised by various studies,[1-4] and it is the most common cancer among men in Nigeria.[4-6] Patients usually present with locally advanced disease or metastatic disease at diagnosis with tendency for high Gleason scores.[1,2,5,6] In this setting of usual late presentation with advanced disease, androgen deprivation therapy in its surgical form (bilateral orchiectomy) rather than its medical form (using luteinizing hormone-releasing hormone (LHRH) analogues/antagonists, anti-androgens and others) is the mainstay of treatment in these patients[2,5,7] due to the fact that it is a much cheaper option as most patients cannot afford regular injections needed to maintain castrate serum testosterone levels.[5,8]

The clinical features of advanced prostate cancer, awareness of the change in quality of life (QoL) caused by ADT, socioeconomic and cultural factors and perceptions about body image are all factors that affect the type of therapy the patient ultimately opts for.[8] The major drawback for a bilateral total orchiectomy (BTO) (which is the goal standard for surgical ADT) is an aversion to an empty scrotum which was reported by Melton et al[9] to have caused a decline in orchiectomy rates in Olmsted County, Minnesota, with patients opting more for the medical option over the years. Cosmetic techniques that left palpable remnants in the scrotum and still achieved the therapeutic goal like bilateral

subcapsular orchectomy (BSO) (the result of Riba[10] modifying the original technique to avoid an empty scrotum), subepididymal orchectomy[11] and subcapsular orchectomy with prostheses[12,13] were reported to be more aesthetic, psychologically satisfying and more acceptable than BTO from the experience or feelings of the writers[10,11,14] and more objectively, from post-operative questionnaires as reported by Sakamoto et al. in Japan.[13]

These reports comparing QoL after BTO versus other cosmetic techniques which were from the Western countries and Asia (Japan) were few/scanty on a search of literature, with more research focus directed at comparing post-operative serum testosterone levels. In our region with its own unique sociocultural variables, no studies were found comparing the QoL after BTO to QoL after such more cosmetic orchectomy options. Therefore, in men with advanced prostate cancer, we set out to study the QoL after BTO compared to after BSO in our region, with an emphasis on the psychological implications and differences.

**Subjects and Methods**

This prospective study was conducted in our institution and approval was obtained from the Health Research and Ethics Committee of our institution on February 11th, 2013, with Health Research committee- assigned number ADM/DCST/HREC/857. The study period spanned 21 months from the beginning of March 2013 to the end of December 2014. Patients with biopsy-proven prostate cancer and features of advanced disease opting for bilateral orchectomy were recruited into the study from the Urology Outpatient Clinics and Wards, with the diagnosis of advanced disease made on clinical (evidence of local advancement on rectal examination and clinical features of metastases), biochemical (prostate-specific antigen [PSA] level) and radiologic grounds. Patients excluded from the study were those on 5a-reductase inhibitors and those that were already on any other form of androgen deprivation therapy before opting for orchectomy.

Informed consent was taken before patients were enrolled in the study using prepared consent forms. Pre-orchectomy data that included relevant history, examination findings and serum PSA were also recorded. The QoL was assessed pre-orchectomy using the Functional Assessment of Cancer Therapy for prostate cancer (FACT-P) questionnaire that was either self-administered by the patients or administered in an interview format which was appropriate for illiterate or incapacitated patients. The FACT-P has five individually scored subscales that evaluate the patient’s physical well-being (PWB), social/family well-being, emotional well-being, functional well-being and the additional concerns specific to prostate cancer – the Prostate Cancer Subscale. Total scores ranged from 0 to 156, with the higher the score, the better the QoL.

The researchers were blinded to the process of counselling patients on the available orchectomy options (BSO versus BTO); however, the final procedure performed depended on what patients’ consented to after adequate explanations and discussions about the options by the other caregivers not directly involved in the study. At the end of the process, the patients were categorised into two groups: BSO group and BTO group based on the type of orchectomy performed.

Bilateral orchectomy was done under local anaesthesia (skin infiltration with 2% xylocaine + adrenaline). The spermatic cord was also infiltrated with the local anaesthetic induction just inferior to the external ring of the inguinal canal. In the theatre, patients were positioned supine and a scrotal median raphe incision was made through skin, dartos and layers of the scrotum and tunica vaginalis to expose the testis and the spermatic cord on one side first.

For total orchectomy, the spermatic cord was split into two or three pedicles through avascular planes with excision of the testis and distal spermatic cord. The remaining pedicles were transfixed using vicryl 2 sutures. For subcapsular orchectomy, a longitudinal incision was made through the tunica albuginea of the testis along its free border, exposing the yellowish inner parenchymal tissue (composed mainly of Leydig cells and seminiferous tubules). The testicular parenchymal tissue was bluntly dissected from the inner wall of the tunica albuginea. The dissected parenchyma was divided at the testicular hilum using scissors. Any tissue remaining on the inside of the tunica albuginea was removed and meticulous haemostasis was achieved using diathermy. The capsule was re-sutured with a continuous layer of 3-0 vicryl. The procedure (total or subcapsular orchectomy) was repeated on the other side through the same skin incision and the wound was closed using 3-0 vicryl to layers of the scrotal wall and 2-0 vicryl to the scrotal skin. The procedure was completed by local dressing, a large gauze pressure pad and a scrotal support.

Subsequently, at 1 month and 3 months post-orchectomy, the QoL of the enrolled patients was assessed and recorded. The study period spanned 21 months.

The data were analysed using SPSS (IBM, New York, United States) statistical software version 16.0. The independent samples t-test, Fisher’s exact test and Chi-square test were used to test for level of significance with confidence interval of 95%.

Limitations encountered were loss of patients to follow-up or death from other comorbidities before conclusion of the study.

**Results**

Sixty-one patients were recruited for the study and their data were analysed. Thirty (49.18%) patients had BTO, while 31 (50.82%) patients had BSO. Overall mean age was 69.5 ± 7.5 years (range = 52–85 years). Mean age in BTO group was 69.7 ± 5.7 years, while that of BSO group was 69.3 ± 9.0 years. The most frequent Gleason score was 9 (24.6%). Cumulatively, 68.9% had Gleason scores of 7, 8 or 9 [Table 1].

Overall mean serum PSA pre-orchectomy level was 49.35 ± 20.91 ng/ml (range = 8.12–88.36 ng/ml) and the mean serum pre-orchectomy PSA levels in the BSO and BTO
groups were $52.04 \pm 21.77$ ng/ml and $46.58 \pm 19.95$ ng/ml, respectively ($P = 0.311$).

The total FACT-G scores that assessed the general QoL and FACT-P scores are also displayed in Table 2. The mean FACT-P scores at 1 month in the BSO and BTO groups were $106.31 \pm 21.09$ and $109.82 \pm 19.52$, respectively ($P = 0.533$), while at 3 months, the mean scores were $107.15 \pm 19.44$ and $109.88 \pm 21.99$ in the BSO and BTO groups, respectively ($P = 0.609$).

Table 3 shows the mean subscale scores at 3 months post-orchiectomy, of which the PWB score in the BSO group was $19.97 \pm 5.36$, while that of the BTO group was $22.57 \pm 4.32$, with $P = 0.041$.

In response to item P5 (I am able to feel like a man) on the questionnaire pre-orchiectomy, 37.70% of the respondents irrespective of the groups chose the ‘quite a bit option’, and this was reflected in the individual groups as demonstrated in Figure 1. By 1 month and increasingly so in 3 months, the ‘a little bit’ option was the most frequent response in both groups [Figure 1].

As shown in Figure 1, average item P5 score at 1 month was $1.90 \pm 1.33$ in BSO group, while it was $1.87 \pm 1.17$ in the BTO group ($P = 0.909$). At 3 months as also shown in Figure 1, average item P5 score was $1.20 \pm 1.13$ in BSO group, while it was $1.38 \pm 1.08$ in the BTO group ($P = 0.536$). $P$ values of mean scores pre-orchiectomy and 1 month and 3 months post-orchiectomy were 0.558, 0.909 and 0.536, respectively, when the BTO group scores were compared to the BSO group (not shown in figure).

**Table 1: Distribution of Gleason scores**

<table>
<thead>
<tr>
<th>Gleason scores</th>
<th>BSO group</th>
<th>BTO group</th>
<th>Total (percentage of all patients)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>1</td>
<td>2</td>
<td>3 (4.9)</td>
</tr>
<tr>
<td>5</td>
<td>2</td>
<td>2</td>
<td>4 (6.6)</td>
</tr>
<tr>
<td>6</td>
<td>4</td>
<td>6</td>
<td>10 (16.4)</td>
</tr>
<tr>
<td>7</td>
<td>7</td>
<td>7</td>
<td>14 (23.0)</td>
</tr>
<tr>
<td>8</td>
<td>7</td>
<td>6</td>
<td>13 (21.3)</td>
</tr>
<tr>
<td>9</td>
<td>8</td>
<td>7</td>
<td>15 (24.6)</td>
</tr>
<tr>
<td>10</td>
<td>2</td>
<td>0</td>
<td>2 (3.3)</td>
</tr>
<tr>
<td>Total</td>
<td>31</td>
<td>30</td>
<td>61 (100)</td>
</tr>
</tbody>
</table>

BSO: Bilateral subcapsular orchiectomy, BTO: Bilateral total orchiectomy

**Table 2: Average Functional Assessment of Cancer Therapy-General and Functional Assessment of Cancer Therapy-Prostate Cancer scores of the studied respondents**

<table>
<thead>
<tr>
<th>Study group</th>
<th>$n$</th>
<th>Pre-orchiectomy quality of life</th>
<th>Quality of life 1 month post-orchiectomy</th>
<th>Quality of life 3 months post-orchiectomy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>FACT-G</td>
<td>FACT-P</td>
<td>FACT-G</td>
</tr>
<tr>
<td>BSO group</td>
<td>31</td>
<td>$76.63 \pm 15.31$</td>
<td>$101.95 \pm 22.75$</td>
<td>$79.12 \pm 17.10$</td>
</tr>
<tr>
<td>BTO group</td>
<td>30</td>
<td>$79.84 \pm 16.08$</td>
<td>$105.36 \pm 22.98$</td>
<td>$81.83 \pm 13.87$</td>
</tr>
<tr>
<td>$P$</td>
<td></td>
<td>$0.429$</td>
<td>$0.563$</td>
<td>$0.499$</td>
</tr>
<tr>
<td>Overall</td>
<td>61</td>
<td>$78.20 \pm 15.64$</td>
<td>$103.62 \pm 22.74$</td>
<td>$80.45 \pm 15.52$</td>
</tr>
</tbody>
</table>

FACT-P: Functional Assessment Of Cancer Therapy-Prostate Cancer, FACT-G: Functional Assessment of Cancer Therapy-General, BSO: Bilateral subcapsular orchiectomy, BTO: Bilateral total orchiectomy

**Table 3: Mean subscale scores at 3 months**

<table>
<thead>
<tr>
<th>Study groups</th>
<th>PWB score</th>
<th>SWB score</th>
<th>EWB score</th>
<th>FWB score</th>
<th>PCS score</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSO group</td>
<td>$19.97 \pm 5.36$</td>
<td>$21.03 \pm 4.31$</td>
<td>$18.80 \pm 4.65$</td>
<td>$18.65 \pm 6.97$</td>
<td>$28.70 \pm 7.06$</td>
</tr>
<tr>
<td>BTO group</td>
<td>$22.57 \pm 4.32$</td>
<td>$21.33 \pm 4.60$</td>
<td>$19.20 \pm 3.89$</td>
<td>$18.67 \pm 7.09$</td>
<td>$28.12 \pm 7.49$</td>
</tr>
<tr>
<td>$P$</td>
<td>$0.041$</td>
<td>$0.793$</td>
<td>$0.721$</td>
<td>$0.991$</td>
<td>$0.754$</td>
</tr>
</tbody>
</table>


**Discussion**

In developed countries, LHRH analogues are the preferred option for androgen deprivation therapy,\(^{[15]}\) while in sub-Saharan Africa, surgical castration is the most common treatment option.\(^{[7,8]}\) Although used to palliate advanced prostate cancer and improve patient’s symptoms such as pain, both medical and surgical ADT also affect the QoL of patients due to the negative effects of castrate testosterone levels on libido, penile erection, hot flushes and others.\(^{[16‑18]}\) Surgical ADT is a simple procedure with few physical side effects, low mortality and cost-effectiveness, but being an invasive procedure with removal of the testes, it can further affect the QoL by causing a psychological stress/dissatisfaction, loss of male sex (gender) identity and poor body image.\(^{[19]}\) This aspect, influenced by the varying perceptions of body image (due to the different cultural norms and beliefs based on region/locality),\(^{[20,21]}\) may even affect their choice of therapy for palliation during a discussion about these treatment options with their pros and cons.\(^{[22]}\)

In our study using the FACT-P questionnaire, the overall QoL scores at 1 month and 3 months did not significantly differ between the two groups of patients. Within the different groups and overall, performing an orchiectomy did not result in any marked improvement or decline in the QoL score. Although the...
sample size may not be adequate for definite conclusions, these results imply that there was no significant benefit in choosing to perform a BSO rather than a BTO. In addition, the results imply that even though bilateral orchietomy may palliate the symptoms of advanced prostate cancer (which may improve the QOL life), it may also cause side effects that bother the patient and reduce the QOL score back down to its previous level when calculated. In a study by Lucas et al.,[19] bilateral orchietomy also did not appear to affect QoL, which is in keeping with observations in this study. In addition, in this same study by Lucas et al.,[19] loss of sexual function, a side effect of bilateral orchietomy, did present as an area of concern, which reinforces our previous comment about the side effects of treatment affecting the QoL. However, all the patients in the study by Lucas et al.[19] had Stage D prostate cancer which may have skewed results.

The PWB score at 3 months post-orchietomy, however, was the only subscale score that was significantly lower (indicating lower ‘PWB’) in the BSO group compared to the BTO group on statistical analysis \( (P = 0.041) \). This finding conflicts with that of a study by Sakamoto et al.[13] comparing the QoL after subcapsular orchietomy (with intracapsular prosthesis) versus total orchietomy. They found that post-operative questionnaires showed that the subcapsular method with intracapsular prosthesis group experienced less mental and physical stress than did the control (total orchietomy) group and recommended that this type of operation can be very beneficial to those suffering from prostate carcinoma in maintaining the quality of their lives, especially in a society composed largely of elderly people.[13] The use of intracapsular prostheses as part of a BSO in the study by Sakamoto et al.[13] certainly adds more bulk to the palpable intrascrotal remnants of the patients and may result in more psychological satisfaction with this particular procedure. In addition, this study by Sakamoto et al.[13] was conducted in Japan with different sociocultural norms and perceptions of body image.[13]
Assessment of the responses and scores for the item P5 (I am able to feel like a man) revealed almost equal declines in scores for this item over 3 months, but there were no significant differences when both groups were compared. These findings support the fact that bilateral orchiectomy regardless of the type negatively affected the physical and identity scores of the patients. The fact that there was a palpable remnant in the scrotum did not seem to significantly alter the perception of patients in the BSO group when compared to those in the BTO group. As previously discussed, the results from the study by Sakamoto et al.[13] incorporating intracapsular prosthesis insertion during a BSO procedure showed that those who had BSO plus the prosthesis had less mental stress. This suggests that the palpable intrascrotal remnant after a BSO without prosthesis may not feel significantly different from the remnants (i.e., spermatic cord and fibrosis) that may be felt after a BTO. Lucas et al.[19] studied 15 patients with Stage D prostate cancer before and after surgery and reported that sex-role identity was not affected by orchiectomy, which conflicts with the findings in our study. Lucas et al.[19] however studied 15 patients with all having Stage D prostate cancer.

**Conclusion**

The studies that their findings were discussed and compared with findings in our study were not designed or set out to compare the QoL after BSO versus BTO using a clinically validated tool like the FACT-P questionnaire. Our study being the first of such in our region indicates that there were no added benefits in doing a BSO over a BTO since there was no significant psychological benefit. BSO is a more thorough and time-consuming operation than the BTO with possibly more risk of complications such as bleeding and haematoma. Such information will be useful in counselling patients about surgical options and best recommendation in view of their overall fitness for surgery and clinical state.

Further multicentric studies with larger sample sizes that include more cosmetic options for bilateral orchiectomy (like the use of prosthesis) in centres where bilateral orchiectomy is still a more favoured option (due to socioeconomic reasons) will help generate more data for comparison of outcomes and will help impact positively on the care of prostate cancer patients, with advanced disease being considered for palliative care.

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**Conflicts of interest**

There are no conflicts of interest.

**References**