Cellulose Dressing Versus Rayon Dressing in Skin Graft Donor Sites: Aspects of Patients’ Health-related Quality of Life and Self-esteem

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Abstract: Objective. The aim of this study was to compare the health-related quality of life (HRQoL) and self-esteem of patients who underwent split-thickness skin grafting, when either cellulose dressings or rayon dressings were applied to the donor sites. Methods. A total of 25 patients, who were enrolled at five participant hospitals and required split-thickness skin grafting for various clinical reasons, were randomized into two treatment groups, the rayon dressing group (n = 13), or the cellulose dressing group (n = 12). All patients were assessed preoperatively and 60 days postoperatively. The HRQoL was assessed with the Short Form-36 (SF-36) health survey questionnaire, and self-esteem was evaluated using the Rosenberg Self-Esteem Scale (RSE)/UNIFESP-EPM (Brazilian versions). There were no surgery-related complications during the study period. Results. In both treatment groups, SF-36 scores for emotional role, mental health, vitality, and general health decreased from baseline. RSE scores increased from baseline in both treatment groups, showing a reduction in self-esteem after treatment. There was a statistical difference (P = 0.024) in the SF-36 bodily pain domain for the rayon group. Conclusion. There were no significant differences in HRQoL and self-esteem between treatment groups. In the rayon-dressing group, there was a significant decrease in bodily pain from baseline.

Split-thickness skin grafting is a procedure commonly used to replace damaged or missing skin.1 Donor site care has been widely studied,2–10 however, the health-related quality of life (HRQoL) of patients who have undergone this procedure needs further study. Many studies have been conducted on various types of dressings to determine which provides an optimal healing environment, pain relief, and is safe and easy to use.11–14

A skin-graft donor-site wound has the potential to affect many aspects of HRQoL of a patient, such as pain, functional capacity, social interaction, and self-esteem.
More recently there has been an increased interest in transforming the quality of life concepts into quantitative measurements that can be used in clinical and economic practices, and this initiative has played an important role in improving health services.

In recent years, quality of life measurement tools have been widely used in clinical and research settings around the world, as well as in multinational, multicenter studies. Quality of life measurement tools may be applied at both individual and population levels. At the individual level, they can be used for assessing the severity and evolution of diseases, etiological factors, and therapeutic success. Additionally, they can be specific in assessing differences between populations, such as ethnicity, age, and socioeconomic structure.

The aim of this study was to evaluate the impact of two different wound dressings applied to split-thickness skin graft donor sites on HRQoL and self-esteem of patients.

Methods

The Research Ethics Committee (CEP) of the Federal University of São Paulo (UNIFESP) approved the study. Written informed consent was obtained from all patients.

This prospective comparative multicenter study was conducted to compare the impact of a cellulose film dressing produced from sugarcane (Veloderm®, BTC srl., Italy) with that of rayon dressings (traditionally used by surgeons), applied to split-thickness skin graft donor sites, on HRQoL and self-esteem of patients.

Twenty-five patients were enrolled between March and October 2006 at 5 participating hospitals in the states of São Paulo (4) and Minas Gerais (1), Brazil. The patients were randomized into two groups by a lottery—the study group (cellulose dressing, n = 12) and control group (rayon dressing, n = 13). Randomization took place in the operating room immediately before surgery.

The sample consisted of 25 patients, predominantly men (n = 18, 72%), married (n = 13, 52%), and age 21 to 73 years (mean, 44.8 years). The patients underwent split-thickness skin grafting for the following clinical reasons: burns (n = 11, 44%), ulcers (n = 6, 24%), traumatic lesions (n = 5, 20%), and other reasons (n = 3, 12%). The patients were evenly distributed between the two groups with regard to the clinical reasons for the split-thickness skin grafting.

The split-thickness skin grafts were obtained from standardized donor sites on the anterior thigh with a Blair knife. All surgical procedures were performed in surgical centers.

All clinical aspects related to the healing of the donor site and possible changes in this process were evaluated during the postoperative follow-up period, but they are not the focus of this study. The study of the HRQoL of patients did not interfere with the healing of the donor site.

After the split-thickness skin graft was harvested, the donor site was first covered with either cellulose dressing or rayon dressing, then with absorbent cotton, and finally bandaged. The wound dressings were kept covered for 24 hours, and after this time the bandage and absorbent cotton were removed, keeping the donor site covered only with a cellulose dressing or rayon dressing.

The donor site remained moist.

The Brazilian versions of the Medical Outcomes Study Short Form-36 (SF-36) health survey questionnaire, and the Rosenberg Self-Esteem Scale (RSE), which were translated into Portuguese, culturally adapted, and validated for Brazil, were administered to the patients. These questionnaires respectively assess the individual’s perception of the different aspects of HRQoL and self-esteem; however, they are not condition-specific questionnaires for patients with wounds. There is no questionnaire currently available in Brazil that specifically assesses patients with wounds.

The SF-36 questionnaire contains 36 items grouped into 8 domains as follows: physical functioning, physical role, bodily pain, general health, vitality, social functioning, emotional role, and mental health. Scores on each domain range from 0 to 100, where 0 corresponds to the worst health status and 100 to the best health status.

The SF-36 domains are described below.

**Physical Functioning** is measured by 10 items in question 3, and evaluates how much health interferes with the individual's ability to perform daily activities, such as dressing, bathing, walking, and climbing stairs, among others.

**Physical Role** is measured by 4 items in question 4, and evaluates how much health interferes with work activities.

**Bodily Pain** is measured by 2 items in questions 7 and 8, and evaluates pain intensity and pain interference with daily life activities.

**General Health** is measured by 5 items in questions 1 and 11, and evaluates how the individual perceives his health status and his opinion about his own future.

**Vitality** is measured by 4 items in question 9, and eval-
uates the levels of energy and fatigue experienced by the individual when performing daily tasks.

Social Functioning is measured by 2 items in questions 6 and 10, and evaluates the extent to which physical or emotional problems interfere with normal social activities.

Table 1. Mean SF-36 and self-esteem scores at baseline and at 60-day follow-up.

<table>
<thead>
<tr>
<th>SF-36 domains and self-esteem</th>
<th>Mean scores-Rayon Group</th>
<th>Mean scores-Cellulose Group</th>
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<tbody>
<tr>
<td></td>
<td>Baseline</td>
<td>60-day follow up</td>
</tr>
<tr>
<td>Physical functioning</td>
<td>61.5</td>
<td>63</td>
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<tr>
<td>Physical role</td>
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<td>40.3</td>
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<td>Emotional role</td>
<td>46</td>
<td>35.8</td>
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<tr>
<td>Mental health</td>
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<td>66.4</td>
</tr>
<tr>
<td>Vitality</td>
<td>72.3</td>
<td>66.9</td>
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<tr>
<td>Social functioning</td>
<td>69.1</td>
<td>72</td>
</tr>
<tr>
<td>General health</td>
<td>76.8</td>
<td>67.9</td>
</tr>
<tr>
<td>Bodily pain</td>
<td>53.3</td>
<td>72.5*</td>
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Self-esteem

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<td></td>
<td>9</td>
<td>10.3</td>
<td>8.4</td>
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*P = 0.024

Figure 1. Mean SF-36 and RSE/UNIFESP-EPM scores for both treatment groups assessed preoperatively and 60 days postoperatively. Pre = Preoperatively  Post = Postoperatively

Emotional Role is measured by 3 items in question 5, and evaluates the degree to which emotional factors interfere with the individual’s ability to perform work activities and other daily life activities.

Mental Health is measured by 5 items in question 9, and evaluates the extent to which feelings such as anxi-
etely, depression, loss of behavioral or emotional control, and psychological well-being interfere with the individual’s HRQoL. The RSE is a 10-item self-report measure of self-esteem, containing 10 positively worded items. The items are answered on a 4-point scale. The total score ranges from 0 to 30 with higher scores indicating lower self-esteem.19,20

The questionnaires were administered during interviews conducted preoperatively (baseline) and at 60-day follow-up. Data were analyzed using two-way, mixed model analysis of variance (ANOVA) and Wilcoxon signed-rank test for comparison of dependent variables.

Results

The mean scores for the 8 domains of the SF-36 and RSE were reported at baseline and at the 60-day follow-up (Table 1). Figure 1 shows a comparison between these data.

In both treatment groups, SF-36 scores for emotional role, mental health, vitality, and general health decreased from baseline, indicating a reduction in quality of life. RSE scores increased from baseline in both treatment groups, showing a reduction in self-esteem after treatment.

There was a significant decrease in bodily pain from baseline in the rayon dressing group ($P = 0.024$). For all other variables, there were no significant differences from baseline within or between treatment groups.

Discussion

Veloderm is a cellulose film produced from sugarcane by a biotechnological process in which, in a culture medium, the bacterium Acetobacter xylinum synthesizes pure cellulose. The dressing is transparent and selectively semi-permeable, allowing gas exchange and water vapor transmission. This prevents liquid strike-through and bacterial penetration, and maintains a moist wound environment. It has small voids to improve drainage and adherence. In the absence of exudate, it may stay in place for seven days, on average, without the need for replacement.21–23 Rayon is a nonadhesive fabric traditionally used by surgeons to cover skin-graft donor-site wounds.

Factors involved in the healing of split-thickness skin-graft donor sites have the potential to affect many aspects of HRQoL and self-esteem of patients. Health-related quality of life assessment has been increasingly considered an important tool to measure change as a result of treatment. There is no condition-specific questionnaire validated for use in Brazil that evaluates the different aspects of HRQoL in patients with wounds; however, it is possible to use generic tools such as the SF-36 in this type of study. Although there are many studies evaluating the HRQoL of patients with wounds,24–31 no studies were found that assess the HRQoL of patients who underwent split-thickness skin grafting.

In the present study, the most common wounds requiring skin grafting for coverage were burns, ulcers, and traumatic lesions. Patients were evenly distributed between the two groups with regard to the clinical reasons for the split-thickness skin grafting.

Assessments of HRQoL and patient satisfaction following treatment have been widely used and accepted as important indicators of quality of care in the public and private sectors. The results of these assessments have been used in quality improvement programs and resource allocation decisions for specific programs in certain healthcare services in addition to helping patients choose between treatment alternatives.

The sample consisted of 25 patients; predominately married men, with a mean age of 44.8 years who underwent split-thickness skin grafting for different clinical reasons. However, it is important to note that these factors had no statistically significant impact in the HRQoL and self-esteem of these patients.

In the present study, SF-36 scores for emotional role, mental health, vitality, and general health decreased from baseline in both treatment groups. However, since emotional role scores decreased in both groups, there is the possibility that this decrease may be due to the surgery itself rather than the wound dressing.

The results also suggest that the negative impact on vitality and general health in the rayon dressing group may be associated with the donor site wound, while the impact on bodily pain and on physical functioning may be related to the type of wound dressing.

There was a significant decrease in bodily pain from baseline in the rayon dressing group ($P = 0.024$). It was observed that the cellulose dressing had a lower adherence to the donor site than the rayon dressing, reducing pain on dressing removal. Bodily pain in the rayon dressing group was the only variable to show a significant difference between baseline and 60-day follow-up scores. For all other variables, there were no significant differences from baseline within or between treatment groups.

RSE/UNIFESP-EPM scores increased from baseline in both treatment groups, showing a reduction in self-
esteem after treatment. To the best of our knowledge, there is no similar study in the literature to date, and therefore, our results may serve as a stimulus for further research.

The limitations of the study include the lack of a condition-specific questionnaire validated for use in Brazil that evaluates the different aspects of HRQoL in patients with wounds, and the small sample size.

**Conclusion**

There were no significant differences in HRQoL and self-esteem of patients with the use of either cellulose or rayon dressings in the treatment of split-thickness skin graft donor sites, except in the rayon dressing group where there was a significant decrease in bodily pain from baseline. It was observed that the cellulose dressing had lower adherence to the donor site than the rayon dressing, which reduced pain on dressing removal. Further studies are needed to evaluate the clinical reasons for the split-thickness skin grafting (eg, burns) on the healing of wounds covered with cellulose dressings for each step of treatment.

**References**


