Effect of new adjuvant chemotherapy combined with reserving nipple and areola breast modified radical mastectomy on breast retention beauty effect and immune function

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ABSTRACT

Objective: To study the effects of new adjuvant chemotherapy combined with reserving nipple and areola breast modified radical mastectomy on breast retention beauty effect and immune function. Methods: 110 cases patients with breast cancer were enrolled and randomly divided into observation group and control group. Observation group received reserving nipple and areola breast modified radical mastectomy, control group received conventional modified radical mastectomy. Then cosmetic effect, quality of life and negative emotion and immune function were compared. Results: (1) Cosmetic effects: Cosmetic effect of the observation group was significantly better than that of the control group (92.73% vs. 58.18%). (2) Negative emotions: AMA, HAMD, SAS, SDS scores of the observation group were significantly lower than that of the control group; (3) Immune function: CD3+ T cells, CD4+ T cells of the observation group were significantly higher than those of control group; CD8+ T cells were significantly lower than those of control group. (4) Life quality and negative emotions: life quality score and HAMA score, HAMD score, SAS score, SDS score of the observation group were lower than those of control group. Conclusion: Reserving nipple and areola breast modified radical mastectomy helps to improve cosmetic effect, alleviate negative mood, enhance immune function, and improve patients’ life quality.

1. Introduction

Nipple areola complex is an important part of female mammary gland. Reserving nipple and areola helps to improve cosmetic effect, improve patients’ life quality. Breast modified radical mastectomy assisted with new adjuvant chemotherapy is the most commonly used treatment for breast cancer[1]. Due to improvement of surgical technique in recent years, and patients’ demands for beauty, Reserving nipple and areola breast modified radical mastectomy has become more and more popular among patients and physicians[2] though it’s still controversial. In this study, we investigated the beauty effects of new adjuvant chemotherapy combined with reserving nipple and areola breast modified radical mastectomy on breast retention beauty and its effects on immune function.

2. Materials and methods

2.1. General information

A total of 110 breast cancer patients I treated in our hospital during April 2009 and July 2011 were enrolled. The inclusion criteria were: (1) all patients are diagnosed with breast cancer; (2) I, II period breast cancer; (3) the maximum diameter of tumor was 3 cm or less; (4) edge of tumor lesion was 3 cm or larger away from the edge of the areola margin; (5) no orange peel skin changes in areola or areola edge; (6) subcutaneous tissue of the nipple areola was not infiltrated by cancer cells; (7) hospital ethics committee approval and consents of the patients.

According to different operative methods, patients were assigned
to observation group and control group with 55 cases in each. The average age of the observation group were (54.45±6.62) years ranging from 26 to 74 years. According to the TNM staging method of International Union against Cancer, there were 20 stage I patients and 35 stage II patients. Lymphatic metastasis was found in 12 cases. Accordingly, the average age of the control group were (54.18±6.68) years ranging from 27 to 72 years. The control group included 22 stage I patients and 33 stage II patients; lymphatic metastasis was found in 11 cases. There was no significant difference in general data including age, TNM stage, lymphatic metastasis, etc between the two groups (P>0.05).

2.2. Treatment

TP neoadjuvant chemotherapy was given for both groups. the regimens were: dorsey 75 mg/m² for day 1; Cisplatin 30 mg/m² for day 2 to day 4, 28 d was considered as a treatment course. All chemotherapy drugs were given by intravenous drip. The observation group underwent reserving nipple and areola breast modified radical mastectomy: cut a small incision surrounded the biopsy shaft, then cut a 3-5 cm line fusiform incision around the small incision, remove the surface skin of the tumor, then keep the skin as free flap and reserve the mammary gland of the nipple, then cut samples to do intraoperative frozen histological test. If the results turned to be positive, then cut the incision to the edge of negative tissues. Meanwhile lymph nodes were removed. The control group underwent modified radical mastectomy: breast and axillary incisions were designed, local lesions were removed together with skin and glands 2 cm surrounding the lesions. Frozen histology test were done to make sure incision edge was negative for cancer, surrounding lymph nodes were all removed. Followed up for all patients were conducted for 3-5 years postoperatively.

1.3. Observed indexes

1.3.1. Cosmetic effect evaluation

Cosmetic effects were evaluated using the following criteria: (1) Excellent: bilateral breast is symmetrical, two nipples are 2 cm apart at the same level, the involved breast shows normal shape and are free of deformity resulted from scars. No obvious difference in softness felt in touching, and the patient are very satisfied. (2) Good: bilateral breast is symmetrical. Two nipples are 2-3 cm apart at the same level. Skin of the involved side turns shallow or brightened. Shape of the involved breast is basically normal or slightly smaller than the healthy one, and its softness are affected. Patient is basically satisfied with the outcomes. (3) Poor: bilateral breast is asymmetry, two nipples are more than 3 cm apart at the same level, the lateral skin become thicken or coarse and feels like rubber. The involved breast is obviously smaller than the other one.

1.3.2. Life quality

1 week after the surgery, general quality of life inventory-74 (GQOLI-74) was applied to evaluate material life dimension, body health dimension, mental health, social function dimensions.

1.3.3. Negative emotions

1 week after the operation, negative emotions and anxiety were evaluated with Hamilton Anxiety Scale (HAMA) and Self-Rating Anxiety Scale (SAS). Depression was evaluated with Hamilton Depression Scale (HAMD), and Depression Self Rating Scale (SDS).

1.3.4. Immune function

1 week after the operation, peripheral blood was collected to detect CD3⁺, CD4⁺ and CD8⁺ T cell counts.

1.4. Statistical analysis

All data were analyzed with SPSS 18.0 software. Data were expressed as (Mean±SD) and compared with t test. Counting data were expressed as with frequency (n) or rate (%) and analyzed by chi-square test. P<0.05 was considered as significant difference.

3. Results

3.1. Cosmetic effects

In the observation group, a total of 31 cases were evaluated as excellent, 20 as good and 4 as poor regarding the cosmetic effects. In the control group, the corresponding number was 19, 13 and 23. The rate of getting excellent cosmetic effects was significant higher than that of the control group (92.73% vs. 58.18%, χ² = 17.920, P<0.01).

3.2. Negative emotions

Before undergoing the surgery, there was no significant difference in negative emotions between the two groups (P>0.05). After treatment, the negative emotions were significantly improved for both groups. Two groups of negative emotions were significantly improved after treatment, the observation group of HAMA, HAMD, SAS, SDS scores of the observation group were significantly lower than that of the control group (P<0.05) (Table 1).
3.3. Immune function

Before treatment, there was no significant difference in immune function between the two groups (P>0.05). After treatment, CD3+ and CD4+ levels were significantly decreased but CD8+ increased in both groups. The CD3+ and CD4+ levels of the observation group was significant lower than that of the control group, but CD8+ level was significant higher than that of the control group (P all<0.05).

3.4. Life quality

Before treatment, there was no significant difference in all dimensions regarding life quality (P>0.05). After treatment, life quality were significantly improve in both groups, and scores regarding material life dimension, body health dimension, mental health, social function dimensions of the observation group were all significant higher than that of the control group (P<0.05).

4. Discussion

Breast cancer is the most common malignant tumor occurred among Chinese women, which requires comprehensive treatment once it was confirmed. The neoadjuvant chemotherapy combined with surgery is the most commonly used treatment[3]. Neoadjuvant chemotherapy can kill tumor cells, shrink tumors volume, and ensure the completeness of resection[4,5]. Surgical resection can directly remove tumor lesions, meanwhile it aims to reserve normal appearance of the breast and reduce incision size[6].

In clinical, in order to ensure the appearance of postoperative breast, there are two commonly used surgical procedures including breast-conserving surgery and modified radical mastectomy combing with breast reconstruction. The former is more frequently used in western countries, and the latter are more commonly applied in Asian countries because the size of Asian women’s breasts is relatively smaller[7]. The reconstruction of nipple areola complex is hard, but it’s an important part of the breast tissue. Thus conservation of nipple areola complex can help to improve the cosmetic effects[8].

Reserving nipple and areola breast modified radical mastectomy was proposed during the recent years. Except advantages of reservation of nipple and areola tissues, its basic procedure is similar with modified radical mastectomy and has favorable cosmetic effects[9]. This study showed that patients in observation group are satisfying with outcomes of reserving nipple and areola breast modified radical mastectomy, which is significant better than that of the control group. Undergoing modified radical mastectomy may cause heavy physiological burden to patients due to great change in the breast shape. Sometimes, it may affect patients normal life[10], on the contrary, reserving nipple and areola breast modified radical mastectomy helps to reduce patients’ burden and improve their

Table 1.

Comparison of negative emotions between the two groups (Mean±SD).

<table>
<thead>
<tr>
<th>Group</th>
<th>Time</th>
<th>HAMA score</th>
<th>HAMD score</th>
<th>SAS score</th>
<th>SDS score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observation group</td>
<td>Before treatment</td>
<td>32.12±4.32</td>
<td>31.56±4.52</td>
<td>70.21±8.12</td>
<td>64.32±7.21</td>
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<td></td>
<td>After treatment</td>
<td>17.35±1.61*#</td>
<td>18.41±1.93*#</td>
<td>49.63±5.46*#</td>
<td>45.8±5.44*#</td>
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<tr>
<td>Control group</td>
<td>Before treatment</td>
<td>31.85±4.12</td>
<td>31.24±4.32</td>
<td>69.54±7.65</td>
<td>64.24±7.42</td>
</tr>
<tr>
<td></td>
<td>After treatment</td>
<td>26.84±3.26*#</td>
<td>27.13±3.25*#</td>
<td>61.53±8.34*#</td>
<td>58.82±6.52*#</td>
</tr>
</tbody>
</table>

*P<0.05 comparing with score before treatment; #P<0.05 comparing with score of the control group after treatment.

Table 2.

Comparison of immune function between the two groups (Mean±SD).

<table>
<thead>
<tr>
<th>Group</th>
<th>Time</th>
<th>CD3+ T cell</th>
<th>CD4+ T cell</th>
<th>CD8+ T cell</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observation group</td>
<td>Before treatment</td>
<td>50.12±6.58</td>
<td>28.32±4.12</td>
<td>13.32±1.25</td>
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<td>After treatment</td>
<td>44.29±6.62*#</td>
<td>24.52±3.45*#</td>
<td>15.56±1.84*#</td>
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<tr>
<td>Control group</td>
<td>Before treatment</td>
<td>48.65±5.71</td>
<td>27.64±3.54</td>
<td>13.12±1.02</td>
</tr>
<tr>
<td></td>
<td>After treatment</td>
<td>35.51±5.58* #</td>
<td>18.95±2.31*</td>
<td>21.45±2.35*</td>
</tr>
</tbody>
</table>

*P<0.05 comparing with score before treatment; #P<0.05 comparing with score of the control group after treatment.

Table 3.

Comparison of life quality between the two groups (Mean±SD).

<table>
<thead>
<tr>
<th>Group</th>
<th>Time</th>
<th>Material life dimension</th>
<th>Body health dimension</th>
<th>Mental health dimension</th>
<th>Social function dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Observation group</td>
<td>Before treatment</td>
<td>43.12±5.12</td>
<td>45.32±5.04</td>
<td>43.65±5.24</td>
<td>44.12±5.21</td>
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<tr>
<td></td>
<td>After treatment</td>
<td>55.14±6.13*#</td>
<td>63.85±7.24*#</td>
<td>65.21±7.23*#</td>
<td>60.22±7.44*#</td>
</tr>
<tr>
<td>Control group</td>
<td>Before treatment</td>
<td>43.45±5.21</td>
<td>46.08±5.13</td>
<td>44.33±5.33</td>
<td>44.38±5.34</td>
</tr>
<tr>
<td></td>
<td>After treatment</td>
<td>48.67±4.43*</td>
<td>52.45±6.45*</td>
<td>53.18±6.89*</td>
<td>51.45±6.45*</td>
</tr>
</tbody>
</table>

*P<0.05 comparing with score before treatment; #P<0.05 comparing with score of the control group after treatment.
life qualities. Results showed that material life dimension, body health dimension, mental health, social function dimensions of the observation group was significant higher than that of the control group, and, HAMA, HAMD, SAS, SDS scores are lower too indicating the reserving nipple and areola breast modified radical mastectomy helps patients cope with negative emotions and improve life quality.

Besides good cosmetic effects, the reserving nipple and areola breast modified radical mastectomy can reduce reduce the trauma caused by the resection. Surgical trauma can cause damage to the body, especially the immune function might be greatly depressed[11]. Cellular immunity is an important part of the body's immune system, also it plays important role to kill tumor cells[12] against malignant tumor. T cells is one of these immune cells which can be categorized as CD3\(^+\), CD4\(^+\), and CD8\(^+\) T cells according to its surface molecules. Of which CD3\(^+\) is the common markers of all cells which can reflect the cell immune function. CD4\(^+\) T cell, as an assistant marker can participate the process of cell immune function. As for CD8\(^+\) T cells, it can inhibit cell immune function. This study showed that CD3\(^+\), CD4\(^+\) counts of the observation group were significant higher than that of the control group, while CD8\(^+\) T cell contents were significant lower than that of the control group indicating reserving nipple and areola breast modified radical mastectomy helps to improve cell immune function.

In conclusion, reserving nipple and areola breast modified radical mastectomy produce good cosmetic outcomes, alleviate negative emotions, improve patients' immune function and life quality. Due to small sample, further study with larger sample size is needed, and objective indexes evaluating the cosmetic effects need to be explored and compared.

References