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Effect of breast-conserving surgery and modified radical mastectomy on operation index, symptom checklist-90 score and prognosis in patients with early breast cancer

Han Qiu, MM[a], Wen-Hui Xu, MM[b], Jun Kong, MM[a], Xiao-Jun Ding, MM[a], Deng-Feng Chen, MM[a,*]

Abstract

The present study aims to analyze the effects of breast-conserving surgery and modified radical mastectomy on operation indexes, Symptom checklist-90 scores and prognosis in patients with early breast cancer.

The clinical data of 128 patients with breast cancer who were treated in our hospital from May 2015 to May 2016 were included into the analysis. These patients were divided into 2 groups, according to the different modes of operation (n = 64): control group, patients underwent modified radical mastectomy; observation group, patients underwent early breast conserving surgery. Then, the surgical indexes and prognosis were compared between these 2 groups.

Intraoperative bleeding volume, incision length and hospitalization duration were better in the observation group than in the control group ($P < .05$). Furthermore, postoperative symptom checklist-90 scores in the observation group were better than scores before the operation, and were better than the scores in the control group ($P < .05$). Moreover, the incidence of postoperative complications was lower in the observation group (3.13%) than in the control group (21.88%, $P < .05$).

Early breast-conserving surgery is more advantageous for breast cancers and results to lesser bleeding, rapid recovery, and fewer complications.

Abbreviations: SCL-90 = symptom checklist-90, TNM = tumor-node-metastasis.

Keywords: breast Cancer, breast conserving surgery, modified radical mastectomy, prognosis, symptom checklist-90 score

1. Introduction

Breast cancer is 1 of the leading malignant tumors that causes death in women worldwide, and its incidence has continuously increased in recent years.[1–3] Surgery remains the main treatment for breast cancer. Since breast-conserving surgery not only guarantees the survival rate of patients, but also maintains the physical function and appearance of the body after the operation in Europe, the United States and other developed countries, it has become a routine surgical treatment for breast cancer.[4,5] With the continuous updating of the concept of breast cancer treatment, breast-conserving surgery would gradually become the main surgical procedure for breast cancer.[6–8] In the present study, the operative effects, Symptom checklist-90 (SCL-90) scores and prognoses of patients who underwent breast-conserving surgery and modified radical mastectomy for early breast cancer were compared, in order to explore the advantages of breast-conserving surgery for breast cancer. The details are reported as follows.

2. Materials and methods

2.1. General information

The clinical data of 128 patients with breast cancer, who were treated in our hospital from May 2015 to May 2016, were included into the analysis. Inclusion criteria: patients diagnosed with breast cancer by imaging and pathological examination, who had a single tumor lesion, were at tumor-node-metastasis (TNM) stage I-II, with a lesion diameter of ≤3 cm, and had no occurrence of distal metastasis; patients who did not receive radiotherapy and chemotherapy before the operation; patients who voluntarily received surgery and provided a signed informed consent. Exclusion criteria: patients with malignant tumors, other malignant diseases and abnormal functions of the heart, liver and kidney; patients with operation contraindications. These patients were divided into 2 groups according to different modes of operation (n = 64, each). The age of patients in the

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[a] Galactophore Department, [b] Gastrointestinal Surgery Department, The Second Clinical Medical College, Yangtze University, Jingzhou, China.

[*] Correspondence: Deng-Feng Chen, Galactophore Department, The Second Clinical Medical College, Yangtze University, No.60 of Jingzhou Central Street, Jingzhou District, Jingzhou 434000, China (e-mail: hanqiu_dr@163.com).

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Table 1

The comparison of operation indexes between the 2 groups ($\bar{x} \pm s$).

Groups	Bleeding volume (mL)	Incision length (cm)	Hospitalization duration (d)
Observation group (n = 64)	278.36 ± 29.11	4.30 ± 1.12	11.06 ± 1.52
Control group (n = 64)	416.25 ± 43.42	13.82 ± 1.94	15.86 ± 2.74
t	21.1022	33.9986	12.2552
P	< .05	< .05	< .05

observation group ranged within 34 to 50 years old, with an average age of 42.27 ± 8.09 years old. Lesion sites: the lesions were on the left side in 35 patients, and on the right side in 29 patients. TNM stage: 42 patients were at stage I, and 22 patients were at stage II. The age of patients in the control group ranged within 35 to 52 years old, with an average age of 43.29 ± 8.12 years old. Lesion sites: the lesions were on the left side in 39 patients, and on the right side in 25 patients. TNM stage: 37 patients were at stage I, and 27 patients were at stage II. The differences in baseline data between these 2 groups were not statistically significant ($P > .05$). This study was conducted in accordance with the declaration of Helsinki and approved by the local Ethics Committee. Written informed consent was obtained from all participants.

2.2. Methods

Patients in the control group underwent modified radical mastectomy: After anesthesia, a spindle-shaped incision was made. Then, the nipple of the affected breast, the skin within 3 cm around the tumor, and the affected lacteal gland were resected, and the pectoralis major and pectoralis minor were preserved. Subsequently, the axillary lymph nodes were routinely dissected, a negative pressure drainage tube was placed, and the incision was sutured and dressed. Patients in the observation group underwent early breast conserving surgery: The site of the incision was determined according to the location of the lesion, and an arc or radial incision was made. The lacteal gland within 2 cm to the margins of the lesion, partial epidermis and fascia pectoralis were removed. When the tumor mass was excised, markers were made on the 4 quadrants and base part, and the mass was sent for pathological examination. If the marginal tissue of the tumor mass was proven to be negative, the axillary lymph nodes and lymph nodes among the pectoral muscles were dissected. The axillary lymph node dissection procedure: A longitudinal incision was made on the lateroposterior side of the pectoralis major in the axilla, and the axillary lymph nodes were removed through the radial incision from the axillary fold to the upper quadrant of the adjacent lacteal gland. When the incision was sutured, the glands were sutured by absorbable suture in an introversion manner, in order to prevent shrinkage of the breast.

2.3. Assessment criteria[9,10]

The psychological state was assessed according to the symptom checklist SCL-90, in which 9 factors including, somatization, depression, anxiety and hostility, were scored. The staff explained the general scoring method and requirements to the examinee before the assessment. Then asked them to make an independent self-assessment that is not affected by anyone, and filled it in with pencil. Each item of symptom checklist-90 (SCL-90) adopted a 5-level scoring system, as follows. None: Consciously without the problem, the score was 1 to 1.5 points; Very light: The symptoms were conscious, but there was no actual impact on the subject, or the impact was slight, the score was 1.5 to 2.5 points; Moderate: Consciously having the symptom had certain influence on the subjects, with a score of 2.5 to 3.5 points; Emphasis: Conscious of this symptom, which had a considerable impact on the subjects, the score was 3.5 to 4.5 points; Severe: Consciously the frequency and intensity of this symptom were very serious, and the impact on the subject was severe, with a score of 4.5 to 5 points. The total score was 160 points. The lower the score was, the better the mental state became.

2.4. Statistical analysis

Data were statistically analyzed using the SPSS 21.0 software. Normally distributed measurement data were expressed as mean ± standard deviation (x ± SD). The differences in count data between groups were evaluated using X^2-test. Count data were expressed as the number of cases, and compared between groups using *t* test. $P < .05$ was considered statistically significant.

3. Results

3.1. Operation indexes

The operation indexes in the observation group were all better than those in the control group ($P < .05$, Table 1, Fig. 1).

3.2. SCL-90 scores

Before the operation, the SCL-90 scores were 136.11 ± 35.14 and 143.86 ± 39.54 in the control group and observation group,

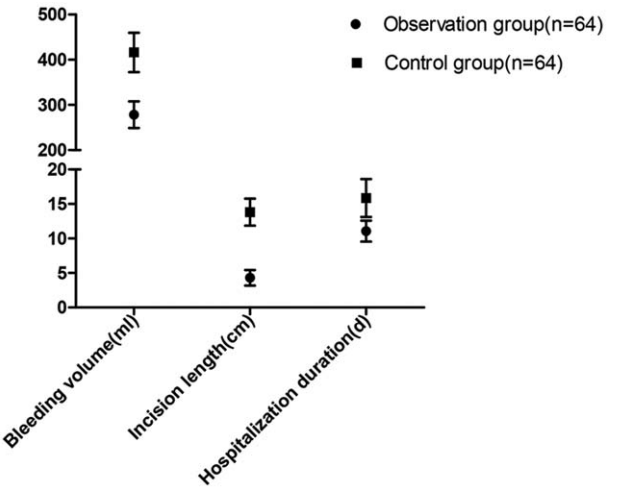

Figure 1. The comparison of operation indexes between the 2 groups.

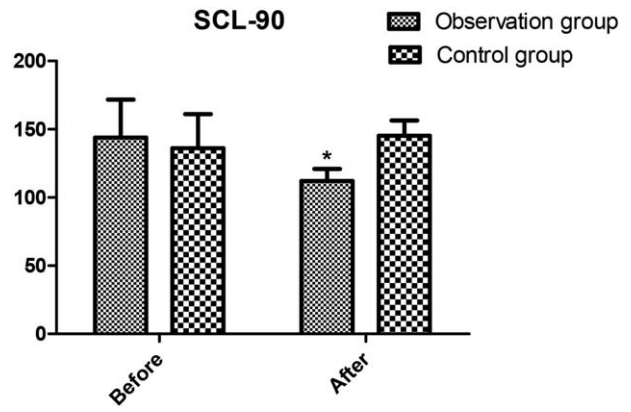

Figure 2. The comparison of SCL-90 before and after the operation between the 2 groups. SCL-90, Symptom checklist-90. *Compared with before operation, $P < .05$.

respectively. After the operation, the SCL-90 scores were 145.26 ± 15.62 and 112.03 ± 12.41 in the control group and observation group, respectively. Postoperative SCL-90 scores in the observation group were better than scores before the operation, and were better than scores in the control group ($P < .05$, Fig. 2).

3.3. Complications and prognosis

The incidence of postoperative complications was lower in the observation group (3.13%) than in the control group (21.88%, $P < .05$). For the 1-year follow-ups after the operation, the differences in local recurrence rate, distant metastasis rate and survival rate between the 2 groups were not statistically significant ($P > .05$, Table 2).

4. Discussion

Modified radical mastectomy is 1 of the main methods of clinical treatment for breast cancer, in which the purpose to thoroughly eliminating breast cancer is achieved by removing the lesions and adjacent tissues of breast cancer. Modified radical mastectomy can be classified into 2 types: 1 type is Patey's operation, in which the pectoralis major is preserved; another type is Auchincloss's operation, in which the pectoralis major and pectoralis minor are retained. In the latter, the axillary lymph nodes can also be thoroughly dissected while preserving the pectoralis major and pectoralis minor.[11] At present, modified radical mastectomy is usually applied to patients with stage I and II breast cancer, especially in patients with lesions distributed in the lateral breast and patients with axillary lymph node metastases.[12] However, in modified radical mastectomy, all breast tissues must be removed, the wound is relatively large, the shape of the patient is seriously damaged, some of the patients cannot accept such change, the psychological state of the patient is affected, and postoperative quality of life is seriously affected.[13–15] A clinical trial revealed that breast cancer is a systemic disease, in which a number of breast cancer patients initially developed lymphatic metastasis, and developed to hematogenous metastasis. The curative effect of local excision was equal to that of radical resection, which provided theoretical support for breast-conserving surgery.[16] In the present study, the results revealed that intraoperative bleeding volume, incision length and hospitalization duration were better in the observation group than in the control group, and that the incidence of postoperative complications was lower in the observation group (3.13%) than in the control group (21.88%, $P < .05$). This suggests that early breast-conserving therapy for breast cancer is safe, shortens the operation time and reduces the bleeding volume, and decreases the risk of postoperative complications.[17,18] It has been considered that this is associated with minimal invasion of breast-conserving surgery. For the 1-year follow-up after the operation, the differences in local recurrence rate, distant metastasis rate and survival rate between the 2 groups were not statistically significant. This suggests that these 2 kinds of surgery have similar curative efficacy, and both can reduce the relapse rate and prevent lymph node metastasis.[19] Furthermore, breast-conserving surgery can not only effectively remove the lesions of breast cancer, but also preserve the integrity of the breast to the maximum, meeting the requirement of patients to maintain a beautiful appearance. Therefore, it can effectively improve the postoperative psychological state of patients.[20–22] In addition, the present study also revealed that the postoperative SCL-90 score in the observation group was better than that before the operation, and better that in the control group, further suggesting that breast-conserving surgery has a promoting effect on the psychological state of patients with breast cancer. Breast-conserving surgery is not suitable for all breast cancer patients. If the patient is complicated with collagen vascular disease or the lesions are centrally distributed, breast-conserving surgery would not be appropriate.[23] Before choosing the operation procedure, the surgeon needs to strictly master the indications of the operation, which include the following:

(1) the pathological stage of breast cancer should be within stage I-II, and the lesion diameter should be ≤3 cm;
(2) the tumors should be located around the nipple, and are >2 cm apart from the mammary areola;
(3) the boundaries of the lesion are distinct;
(4) the patients themselves put forward the requirement of breast conserving;
(5) the malignancy of the biological behavior of the tumor is low;
(6) the breast does not present with extensive micro-calcification;

Table 2

The comparison of complications and prognosis between the 2 groups n (%).

	Complications						Prognosis		
Group	Infection	Upper limb edema	Subcutaneous hemorrhage	Scalp hydrops	Cellulitis	Total	Local recurrence	Distant metastasis	Survival
Observation group (n = 64)	0(0.00)	1(1.56)	0 (0.00)	1 (1.56)	0 (0.00)	2 (3.13)	2 (3.13)	3 (4.69)	39 (60.94)
Control group (n = 64)	3 (4.69)	3 (4.69)	2 (3.13)	4 (6.25)	2 (3.13)	14 (21.88)	1 (1.56)	3 (4.69)	38 (59.38)
x^2	1.3653	0.2581	0.5079	0.8325	0.5079	10.2857	0.0000	0.0000	0.0326
P	>.05	>.05	>.05	>.05	>.05	<.05	>.05	>.05	>.05

(7) the tumor lesion is single, without signs of skin and chest wall involvement;
(8) the breast-tumor ratio is appropriate, and it is expected that good shape can be maintained after breast-conserving surgery;
(9) patients with advanced local tumor that has been degraded to stages I and II tumor through treatment.[24]

In summary, the curative effect of early breast-conserving surgery on breast cancer is similar to that of modified radical mastectomy. However, breast-conserving surgery is more advantageous in terms of shorter operation time, lower bleeding volume and reduced postoperative complication incidence, which is worth promoting.

Author contributions

Han Qiu, Wen-Hui Xu and Deng-Feng Chen were involved in designing the work, drafting the manuscript and revising it critically for important intellectual content; Jun Kong and Xiao-Jun Ding made substantial contributions to the acquisition, interpretation and analysis of data; All authors approved the final version to be published.

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