Observation and analysis of clinical efficacy of breast-conserving therapy integrated with neoadjuvant chemotherapy on Breast Cancer

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Abstract: To investigate the efficaciousness of breast-conserving therapy in connection with neoadjuvant chemotherapy on breast cancer. 68 patients, who were confirmed going down with breast cancer and hospitalized from June 2015 and June 2017, were sampled and divided into two groups using the random digit table, i.e. the observation group (n=34) and the control group (n=34). Patients in the observation group experienced breast-conserving therapy integrated with neoadjuvant chemotherapy, but those in the control group received the radical resection of breast cancer. Patients' condition in surgery, incidence of post-surgery complications as well as patient survivals were compared and coded. In the observation group, surgical duration, intraoperative bleeding amount, length of stay in hospital and incidence rate of post-surgery complications were all lower than the patients with the similar conditions in the control group with evident distinctions in statistics ($p<0.05$). In the observation group, survival ratios of one-to-five-year living patients were evidently higher than those in the control group. The distinctions owned evident significance in calculations ($p<0.05$). In comparison of the recurrence ratio of disease and the rate of distant metastasis between the observation group (5.88% and 8.82%) and the control group (11.76% and 8.82%), differences had no statistical significance ($p>0.05$). Before treatment, compared with the score of life quality in the two groups, no evident distinction in statistical exists ($p>0.05$), however, after that, the life quality in the observation group evidently outweighs the quality in the control group, which shows the distinctions in statistics ($p<0.05$). Breast-conserving therapy in combination with neoadjuvant chemotherapy shows promising clinical value in ameliorating the life quality, decreasing the mortality rate and the incidence of adverse reaction, which is expected to be applied in clinical practices as a kind of safe and effective method.

Keywords: Breast-conserving therapy, neoadjuvant chemotherapy, breast cancer, clinical efficacy.

INTRODUCTION

Breast cancer, a common type of malignant tumors in females, has been afflicting more and more young people due to the significant variations in life style and mental pressure, and its incidence rate also keeps increasing (Untch *et al*., 2009). Currently, surgical resection remains to be the major method for treatment of breast cancer, including radical resection, modified radical resection and extended radical resection (Mieog *et al*., 2007, Straver *et al*., 2010). These methods can gain significant efficacy with the lesions being almost fully resected. However, they also raise the risk of the heavy mental pressure and burden to patients for the significant influences on the appearance due to the resection, thereby affecting the life quality of patients (Specht *et al*., 2009; Thie *et al*., 2011). Thus, people are eager for the effective methods for treatment of breast cancer that can maximally retain the breast.

Neoadjuvant chemotherapy has been applied in the breast cancer in advanced stage or with inflammation to minimize the tumor volume. The combination of breast-conserving surgery and neoadjuvant chemotherapy shows a promising prospect in treatment of breast cancer (Al-Hilli Z *et al*., 2016). To simplify the surgical method and improve the surgical efficacy, neoadjuvant chemotherapy has been recommended for treatment before surgery, which is conducive to the breast-conserving operations (Loo *et al*., 2008). In this study, we applied these two methods for treatment of breast cancer patients to compare the efficacy.

MATERIALS AND METHODS

General materials

68 patients who were diagnosed as breast cancer in this hospital and admitted for treatment between June 2015 and June 2017 were selected as the subjects of this study, and all of them signed the written informed consents. Using a random digit table, these patients were placed in two groups, the observation group (n=34) and the control group (n=34). In the observation group, those who aged from 25 to 79 year old were in an average group of patients with (44.5±2.3) years old; their disease course was between 2 and 8 months with an average of (4.5±0.6) months; among these patients, there were 15 with breast cancer in situ and 19 with infiltrating cancer. In the control group, age of patients ranged from 25 to 79 years old with an average of (44.1±2.8) years old; their disease course was between 2 and 8 months with an average of (4.2±0.5) months; among these patients, there were 15 with breast cancer in situ and 19 with infiltrating cancer.

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No evident distinction in statistics was identified compared with the factors, such as the age, disease course and pathological type of patients in the two groups (p>0.05), indicating these comparable data (table 1).

Methods

Breast-conserving therapy in integration of neoadjuvant chemotherapy for patients in the observation group

Chemotherapy protocol: Preparation of docetaxel (75 mg/m^2, Hubei Oulyt Pharmaceutical Co., Ltd.; SFDA No.: H20065513) and epirubicin (75 mg/m^2, Shandong New Era Pharmaceutical Co., Ltd.; SDFA No.: H20123260) was administrated by patients for 4 courses (3 week/course), and intravenous injection of preparation started from the 1st day of the course. Correspondent symptomatic treatment should be adopted for patients with symptoms like vomiting or edema. Two weeks after the last course of neoadjuvant chemotherapy, breast-conserving therapy was carried out in following procedures: An arc-shaped carving was done in the outward and higher quadrant of the affected breast of patients under general anesthesia, and the other incision was made in the axilla on the affected side; resection of tumor began from the place that was 1 or 2 cm far away from the tumor, and the normal breast tissues and fascia of pectoralis major that were located within 2 to 3 cm to the tumor; meanwhile, marks were made on four edges of tumor samples. If negative response was identified in tissues surrounding the surgery margin, the resection range of lymph nodes of this patient should be the same to that of radical resection of breast cancer.

Modified radical resection for patients in the control group

Horizontal or vertical incisions were made in the place that was more than 3 cm away from the tumors, and, with the skip flap being freed, the combination between the breast and fascia of pectoralis major was separated to the outer margin of pectoralis major; then, lymph nodes spread between pectoralis major and pectoralis minor as well as in axilla were radically removed followed by thorough rinsing the wound surface; thereafter, a catheter was placed under the axilla and thoracic wall; wounds were sutured intermittently.

Observation indexes

In this study, patients' condition during surgery, incidence of post-surgery complications and the patient survivals after treatment were observed and analyzed. In the case of patients' condition during surgery, we mainly investigated the surgical duration, intraoperative bleeding amount and length of stay in hospital. As for post-surgery complications, it mainly involved the decrease in count of leukocytes, lymphatic edema and toxic or side effect on gastrointestinal tract. In terms of the survival, we performed statistics on the survival of them at the time points of 1, 2 and 3 years after surgery through follow-up, and within 2 years after surgery, follow-up was carried out once every three months, while 2 years later, it was carried out once every 6 months. During follow-up, examinations like X-ray, ultrasound B and molybdenum target mammography would be performed, so as to determine the recovery, satisfaction and complications of patients in two groups after surgery.

STATISTICAL ANALYSIS

The software of Statistical Product and Service Solutions (SPSS) 18.0 was utilized in this study for data analysis. The data of measurement were shown as mean ± standard error ($\bar{x} \pm s$), and Student's t test was conducted comparing the two groups. The data of numeration were presented as ratio, and chi-square test was performed for comparison. The result (p<0.05) suggested that the distinction had significance in statistics.

RESULTS

Contrast of the patients' condition in surgery between two groups

In the observation group, surgical duration, intraoperative bleeding amount, length of stay in hospital and incidence rate of post-surgery complications were all lower than the patients with the similar features in the control group with obvious variations in statistics (p<0.05; table 2).

Comparison of the incidence of complications between two groups

The rate of incidence on complications in the observation group was 14.71, significantly bring more down than 35.29% in the control group. The variation significantly exists in statistics (p<0.05; table 3).

Comparison of the survival of patients between two groups after treatment

In the observation group, higher survival ratios of one-to-five-year living patients evidently exist compared with those in the control group. The variation significantly exists in statistics (p<0.05; table 4).

Contrast of ratios of recurrence diseases and the rate of remote metastasis in the two groups

In comparison of ratios of recurrence diseases and the rate of remote metastasis in the two groups, variations have no existence in statistics (p>0.05; table 5).

Comparison of life quality before and after treatment between two groups

Before treatment, no evident variation in statistics existed in contrast with the score of life quality in the two groups (p>0.05), while after treatment, the life quality in the observation group significantly outweighed that in the control group. The variation significantly exists in statistics (p<0.05; table 6).

Table 1: General data in the observation group and the control group

Groups	Case (n)	Age (years old)	Disease course (m)	Pathological type (in-situ/infiltrating)
Observation group	34	25-70 (44.5±2.3)	2-8 (4.5±0.6)	15/19
Control group	34	24-71 (44.1±2.8)	1-7 (4.2±0.5)	17/17

Table 2: Comparison of the patients' condition in surgery between two groups ($\bar{x} \pm s$)

Group	Case (n)	Surgical duration (min)	Intraoperative bleeding amount (mL)	Length of stay in hospital (d)
Control group	34	85.4±21.1	212.3±17.8	8.2±2.6
Observation group	34	40.1±7.3*	97.1±12.2*	4.0±1.4*

Table 3: Contrast of complication incidences in the two groups [n (%)]

Group	Case (n)	Decrease in count of leukocytes	Toxic and side-effect on gastrointestinal tract	Lymphatic edema	Total incidence rate (%)
Control group	34	5 (14.71)	4 (11.76)	3 (8.82)	35.29
Observation group	34	2 (5.88)	2 (5.88)	1 (2.94)	14.71*

Table 4: Contrast of the survival of patients between the two groups after treatment [n (%)]

Group	Case (n)	1 year after treatment	3 years after treatment	5 years after treatment
Control group	34	30 (88.24)	28 (82.35)	25 (73.53)
Observation group	34	33 (90.06) *	32 (94.12) *	30 (88.24) *

* $p<0.05$ is in contrast with control group.

Table 5: Comparison of ratios of recurrence diseases and the rate of remote metastasis in the two groups [n (%)]

Group	Case (n)	Recurrence	Distant metastasis
Control group	34	4 (11.76)	3 (8.82)
Observation group	34	2 (5.88)	3 (8.82)

Table 6: Contrast of the life quality in the two groups [($\bar{x} \pm s$), point]

Group	Case (n)	Before treatment	After treatment
Control group	34	58.1±5.2	65.9±5.7
Observation group	34	57.9±5.0	78.0±6.1
t		0.156	8.187
p		>0.05	<0.05

DISCUSSION

A vast majority of breast cancer patients have to bear the pressure of disease and mental burden, which usually make them more susceptible to anxiety, worries, depression or even some other bad feelings. According to statistics, almost 20% of breast cancer patients are concomitant with depression (Nagini S, 2017). Thus, researchers are pursuing for a treatment method that can guarantee not only the definite efficacy and safety, but also the original appearance of breast, which, however, has become one of the problems to be solved. With continuous development in clinical research and medical technique, breast-conserving therapy in combination with neoadjuvant chemotherapy has been applied in clinical practice (Pleijhuis *et al*., 2009. van Riet *et al*., 2010).

Neoadjuvant chemotherapy can reduce the volume of breast mass effectively, which enables some patients that are not eligible for surgery to undergo surgery with significant extension in survival time (Medina-Franco *et al*., 2008). However, the target of breast-conserving therapy is to remove the breast lesion effectively with no effect on the appearance of patients. Thus, combination of neoadjuvant chemotherapy and breast-conserving therapy can improve the clinical efficacy with following advantages: a) decreasing the staging of breast cancer to a certain extent, so as to further improve the clinical efficacy and the rate of breast conservation; b) significant reduction in volume of breast mass through neoadjuvant chemotherapy before surgery, which is conducive to the operation; c) significant inhibitory effect on tumor metastasis through neoadjuvant chemotherapy, which can further reduce the incidence rate of poor prognosis, thereby decreasing the recurrence rate of diseases and increasing the long-term survival rate and life quality of patients.

Results showed in the research that surgical duration, intraoperative bleeding amount, length of stay in hospital

and incidence rate of post-surgery complications in the control group outweighed the similar features in the observation group with evident variations in statistics ($p<0.05$), suggesting that breast-conserving therapy integrated with neoadjuvant chemotherapy can significantly elevate the safety of patients with amelioration in prognosis of patients, which is conducive to the recovery of patients (Gray *et al*., 2004. Alderliesten *et al*., 2011). These results further illustrated that application of breast-conserving therapy in connection with neoadjuvant chemotherapy in breast cancer is able to evidently reduce post-surgery adverse reactions of patients and relieve patients from pains after surgery. In the observation group, survival rates of one-to-five year living patients obviously outweighed those in the control group, and the variation significantly exists in statistics ($p<0.05$), suggestive of a major improvement in survival quality of patients after breast-conserving therapy in integration with neoadjuvant chemotherapy, thereby facilitating the recovery after surgery (Luo *et al*., 2012; Mazouni *et al*., 2007). The surgery-associated indicators and life quality in the observation group evidently outweighed those in the control group, plus the non-significant differences in comparison of the recurrence rate of disease and remote metastasis rate in the two groups, suggestive of the availability and effectiveness of breast-conserving therapy in combination with neoadjuvant chemotherapy in clinical treatment, which can shorten the surgical duration, reduce the intraoperative bleeding amount and increase the life quality of patients, but without any increases in recurrence rate of disease and distant metastasis rate, or any negative effect on prognosis.

In conclusion, breast-conserving therapy in connection with neoadjuvant chemotherapy can ameliorate the quality of survivals among patients and reduce the mortality ratio and incidence of adverse reaction significantly; also, it can improve the life quality of patients effectively without any influence on recurrence of diseases and distant metastasis. Thus, it is of great significance in clinical practice and expected to be a safe and effective method.

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