RESEARCH ARTICLE

# Comparison of Psychological Influence on Breast Cancer Patients Between Breast-conserving Surgery and Modified Radical Mastectomy

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## Abstract

**Objective: To compare the influence of breast-conserving surgery (BCS) and modified radical mastectomy (MRM) on the psychological state of breast cancer patients. Methods: Patients receiving MRM or BCS, and fulfilling the study criteria, were recruited. Patients were required to complete a self-reporting inventory (SCL-90) on admission and 6 months after surgery and a self-rating depression scale (SDS) when discharged from hospital and 6 months after surgery. Results: A total of 70 patients received MRM and 50 BCS. Compared with the national standard, patients suffered to some extent psychological problems on admission, at discharge from hospital and at 6 months after surgery. Patients received BCS had a higher score of SDS compared with those with MRM when discharged from hospital. However, 6 months after surgery, SDS score increased in MRM and decreased in the BCS group, so the difference was significant. Conclusion: The short-term psychological state of patients receiving BCS is worse than that with MRM but superior to MRM 6 months postoperatively. BCS imposed less influence on long term psychological state of breast cancer patients compared with MRM.**

**Keywords:** Breast cancer - breast-conserving surgery - modified radical mastectomy - psychological state

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## Introduction

With a rising diagnostic rate of breast cancer in early stage, and a progress of comprehensive treatment modality, breast conserving surgery (BCS) is considered to be an appropriate treatment for patients with stage I or II disease (Borgen et al., 1995). BCS is reported to alleviate the suffering of patients by reducing the extent of surgical resection and not impairing treatment efficacy, thus fulfills cosmetic requirements and could improve quality of life. Although BCS can ensure the postoperative body appearance, patients are still concerned about the survival time. It is reported that the survival rate of BCS is similar to that of traditional radical mastectomy in patients with early stage breast cancer (Fung et al.,1997). At present, there is a general consensus on BCS for treating Chinese patients with early stage breast cancer (Liu et al., 2003).

However, no comparative study is conducted to investigate the influence of surgical procedures on the psychological state of breast cancer in Chinese patients. Here, we reported a comparison between BCS and modified radical mastectomy (MRM) in Jiangsu Cancer Hospital & Research Institute. The general information of this hospital has been introduced elsewhere (Jiang et al., 2010; Yan et al., 2010; Gao et al., 2011; Huang et al., 2011).

## Materials and Methods

*Patients Selection*

Patients admitted to Jiangsu Cancer Hospital & Research Institute for breast cancer surgery. Patients should meet the following criteria: (1) female between 20 and 60 years of age, with complete medical records (including medical history, physical examination, complete blood cell count, and biochemical analysis profile); (2) without history of chemo-, radiotherapy and other treatments; (3) without heart, lung, kidney and other chronic diseases; (4) Karnofsky performance status of 70 or more. Informed consent was obtained from all patients and this study was approved by the Ethics Committee of Cancer Hospital of Jiangsu Province. All eligible patients were divide into two groups, group A received MRM and group B with BCS. Patients in the BSC and MRM groups were matched for age, work, education state, economic state, religious beliefs and residences.

*Questionnaires*

Psychological state of participants was investigated by questionnaires and husbands of patients were not involved in this process. During the questionnaire investigation, it was clearly explained that the study is anonymous and the data will be strictly confidential.

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**Table 1. Scores of SCL-90 in BCS Group and MRM Group**

| Variables | On admission | | p value | Six month after surgery | | p value | NS |
|---|---|---|---|---|---|---|---|
| | MRM | BCS | | MRM | BCS | | |
| Somatization | 1.53±0.51* | 1.64±0.63* | >0.05 | 1.43±0.39 | 1.43±0.41 | >0.05 | 1.37±0.48 |
| Obsessive symptoms | 1.69±0.58 | 1.79±0.69 | >0.05 | 1.67±0.44 | 1.73±0.57 | >0.05 | 1.62±0.58 |
| Interpersonal relations | 1.50±0.48 | 1.57±0.66 | >0.05 | 1.93±0.72** | 1.58±0.49 | <0.01 | 1.65±0.61 |
| Depression | 1.61±0.54 | 1.71±0.73 | >0.05 | 1.66±0.50* | 1.49±0.65 | >0.05 | 1.50±0.59 |
| Axiety | 1.64±0.68** | 1.78±0.68** | >0.05 | 1.81±0.62** | 1.58±0.50** | <0.05 | 1.39±0.43 |
| Hostility | 1.49±0.48 | 1.67±0.73 | >0.05 | 1.51±0.38 | 1.66±0.54* | >0.05 | 1.46±0.55 |
| Horror | 1.39±0.47** | 1.49±0.60* | >0.05 | 1.92±0.81** | 1.51±0.56** | <0.01 | 1.23±0.41 |
| Paranoid | 1.39±0.51 | 1.46±0.50 | >0.05 | 1.52±0.47 | 1.65±0.62* | >0.05 | 1.43±0.57 |
| Psychotic | 1.42±0.41* | 1.43±0.42 | >0.05 | 1.24±0.34 | 1.38±0.48 | >0.05 | 1.29±0.42 |
| Total Score | 129.16±36.31* | 147.92±40.05** | >0.05 | 146.87±14.42** | 138.92±19.53** | <0.05 | 129.96±8.76 |
| Total system index | 1.55±0.40* | 1.64±0.45** | >0.05 | 1.63±0.16** | 1.54±0.22** | <0.05 | 1.44±0.43 |
| Positive items | 45.36±25.65** | 48.32±28.41** | >0.05 | 40.55±15.85** | 34.72±25.38** | <0.05 | 24.92±18.41 |
| Average score of positive items | 3.11±0.64** | 3.03±0.58** | >0.05 | 2.86±0.43* | 2.71±0.54 | <0.05 | 2.60±0.59 |

*P<0.05 compared with national standard; **P<0.01 compared with national standard; BCS, breast-conserving surgery; MRM, modified radical mastectomy; NS, national standard; scores are shown as average ± standard derivate

After consent was obtained, participants were required to complete the questionnaires on site guided by a standard guidance phrases. For patients with low education level, the questionnaire was explained by investigators in a neutral, unbiased manner, and reported by the patient. Qualified questionnaire was retrieved on site. Patients were required to complete a questionnaire at admission, discharged from hospital, and 6 months after surgery, and the questionnaires after surgery were retrieved at outpatient department or by mail. The questionnaires used are as follows: (1): self-reporting inventory (SCL-90) at admission; (2) self-rating depression scale (SDS) when discharged from hospital; (3): SCL-90 and SDS at 6 months after surgery.

*Data collection and statistical analysis*

Qualified questionnaires were retrieved and collected. Result of each questionnaire item was transformed into numeric and input to computer by two investigators independently. Student test was applied and p value less than 0.05 indicated statistically significant. All analyses were conducted by software SPSS 18.0 and all p values were two-side.

*Research Experience*

We have enough experience in conducting medical researches, and have published some results elsewhere (Huang et al., 2004; Zhou et al., 2009; Jiang et al., 2010; Yan et al., 2010; Gao et al., 2011; Huang et al., 2011; Li et al., 2011; Li et al., 2011; Li et al., 2011; Xu et al., 2011; Xu et al., 2011; Xu et al., 2011; Yan et al., 2011; Zhang et al., 2011; Gong et al., 2012; Li et al., 2012; Yu et al., 2012).

## Results

From September 2007 to September 2009, 70 patients with MRM and 50 patients with BCS were recruited.

*SCL-90 scores*

The scores of SCL-90 in the BCS and MRM groups were showed in Table 1. Compared with the national standard, patients in both groups suffered from somewhat psychological problems. For example, the scores of somatization, anxiety, hostility and horror were higher than the national standard; but there was no statistical difference between BCS and MRM. Six months after surgery, patients in the MRM suffered from interpersonal sensitivity, depression, anxiety, phobic anxiety and other psychological problems; patients in the BCS groups suffered from anxiety, hostility and phobic anxiety. The scores of international sensitivity, anxiety and phobic anxiety and total score of patients with MRM were significantly higher than those of patients received BCS.

**Table 2. Scores of SDS in BCS or MRM Group**

| | Discharged | After surgery | NS |
|---|---|---|---|
| MRM | 56.57±13.15** | 61.07±14.13** | 41.88±10.5 |
| BCS | 62.78±14.50** | 46.45±14.82* | |
| P value | <0.05 | <0.01 | |

*P<0.05 compared with national standard; **P<0.01 compared with national standard; BCS, breast-conserving surgery; MRM, modified radical mastectomy; NS, national standard; scores are shown as average ± standard derivate

*SDS scores*

The SDS scores of patients were present in Table 2. When discharged from hospital, the SDS score in the BCS group was significantly higher than that in MRM; however, the SDS score of patients with BCS was statistically lower than that of patients with MRM 6 months after surgery. In the MRM group, the SDS score increased at 6 months after surgery compared with the score discharged from hospital, but the SDS score decreased in the BCS group. The SDS scores of two groups were significantly higher than the national standard (Zhang et al.,1998).

## Discussion

According to the national survey, breast cancer patients are complicated with certain extent of psychological problems, such as somatization, anxiety, phobic anxiety, depression, etc. Grade of many items in the SCL-90 scale and the general performance of SDS scale suggest that

psychological status of patients with breast cancer was significantly different compared with general population. Age, economy, treatment and other factors could impose impact on the psychological state of breast cancer patients. However, several critical factors affecting psychological state could be different during diagnosis, treatment and rehabilitation, especially surgery.

Breast-conserving surgery (BCS) is a landmark for treating patients with early stage breast cancer. Currently, the percentage of BCS is about 50% in the United States and west Europe, 75% in Singapore and 40% in Japan. However, rate of BCS is still lower in China and is only available in several cancer center hospitals. Patients after BCS often experienced more psychological pressure, concerned about the recurrence, metastasis, and side-effects of chemotherapy or radiotherapy, etc. This could be explained by the consideration of patients that radical mastectomy is the only effective treatment and usually they have little knowledge regarding the indications and long-term efficacy of BCS.

Our results suggested that psychological features of patients after BCS or MRM varied afterwards. At 6 months after surgery, normal life of patients in the MRM group was impaired due to the resection of breast. Stevens and colleagues reported that the psychological alterations were resulted from the weakened female sexy and impaired sexual life, actually 80% patients have completely no sexual life (Stevens et al.,1984). Other factors affecting psychological state are depression, lack of sports, eg. swimming, etc (Rowland et al.,2000). However, at this time, patients with BCS have already experienced chemotherapy or radiotherapy and the psychological pressure was reduced by the tolerable side-effects, no recurrence or metastasis and comparatively satisfactory body appearance. Therefore, scores of interpersonal sensitivity, anxiety and horror and the SDS scores in the MRM group were significantly higher than those in the BCS group. This is inconsistent with previous report (Yang etal., 2005). Thus, in the treatment of breast cancer, it is important to communicate with patients and explain to them that BCS is also a radical surgery, and has similar long-term survival rate for early stage breast cancer comparing with MRM.

In conclusion, this study revealed that the short-term psychological state of patients received BCS is worse than MRM but superior to MRM at 6 months postoperatively. BCS imposed less influence on long term psychological state of breast cancer patients compared with MRM. Healthcare workers should consider active and effective psychological interventions according to psychological features of patients, and it is also necessary to teach patients to understand cancer, change their wrong minds and preconceptions.

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