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Original Article

Clinical efficacy of immediate breast reconstruction surgery with extended latissimus dorsi myocutaneous flap after modified radical mastectomy

Jing Pei[1*], Jing Zhang[2*], Jun Xu[1], Xiaowei Yang[1], Benzhong Wang[1]

[1]Department of Breast Surgery, The First Affiliated Hospital of Anhui Medical University, Hefei, Anhui Province, China; [2]Department of Breast Surgery, Xuzhou Cancer Hospital, Xuzhou, Jiangsu Province, China. [*]Equal contributors and co-first authors.

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Abstract: Objective: To observe the clinical efficacy of immediate breast reconstruction surgery (IBRS) with extended latissimus dorsi myocutaneous flap (ELDMF) after modified radical mastectomy (MRM). Methods: Twenty-four patients with breast cancer treated in our department during April 2016 to April 2017 were included in this study, and were divided into two groups according to their own wills: IBRS group (n=9, performed IBRS with ELDMF after MRM) and MRM group (n=15, only performed MRM). The postoperative adverse reaction, rehabilitation condition, patient satisfaction and quality of life were compared between the two groups. Results: There were no significant differences in the incidences of postoperative subcutaneous hydrops and flap necrosis, activity condition of affected limb and shoulder joint, length of stay, drainage time and time to first postoperative adjuvant therapy in the two groups (all P>0.05). Patient satisfaction with surgery and postoperative quality of life in IBRS group were higher than those in MRM group (both P<0.001). Five patients in IBRS group were performed adjuvant chemoradiotherapy without the necrosis in the transferred flap. Two groups of patients were followed up for 12 months with no local recurrence or metastasis. Conclusion: IBRS with ELDMF after MRM is easy to operate, and it can guarantee therapeutic effect and maintain good breast shape, which can improve patient satisfaction and quality of life.

Keywords: Modified radical mastectomy, extended latissimus dorsi myocutaneous flap, immediate breast reconstruction surgery

Introduction

Amastia, sunken armpit, destruction of chest wall and great change in the shape after modified radical mastectomy (MRM) appear in the patients, which will destroy the beautiful physique of women and the original physiological characteristics, and will bring great psychological pressure to the patients [1, 2]. Studies have pointed out that breast reconstruction surgery (BRS) can improve the therapeutic effect and patient satisfaction after MRM, which has been an important part of breast cancer treatment [3, 4].

BRS with autologous tissue reconstructs latissimus dorsi myocutaneous flap (LDMF) and retains partial transverse rectus abdominis myocutaneous flap (TRAMF) [5, 6]. Breast reconstruction with pedicled TRAMF has obvious advantages including better breast tactility and shape, but the surgical approach is very complicated and can bring greater surgical wounds to patients [7]. Conversely, BRS with extended latissimus dorsi myocutaneous flap (ELDMF) is characterized by easier operation and smaller wound, which can completely meet the needs of breast reconstruction as the breasts of oriental women are relatively small [8]. Twenty-four patients with the treatment for breast cancer admitted to our hospital during April 2016 to April 2017 were included in this study to observe the clinical efficacies of MRM and immediate breast reconstruction surgery (IBRS) with ELDMF after MRM.

Materials and methods

Case selection

The study was approved by the Ethics Committee of our hospital and the informed consents

were obtained from patients and their families. Twenty-four patients treated with MRM in our hospital during April 2016 to April 2017 were selected to perform prospective observation, and were divided into two groups according to their surgical options: IBRS group (n=9, performed IBRS with ELDMF after MRM) and MRM group (n=15, only performed MRM).

Inclusion criteria: Patients with stages I, IIa, IIb, or IIIa breast cancer (patients with stage III are mostly with extensive lymphatic metastasis, so they are not recommended for BRS); patients who needed to undergo MRM; patients or their families signed informed consents; patients who could assist in completing related examinations.

Exclusion criteria: Patients who had other serious diseases including heart disease, uremia, dysfunction of blood coagulation, etc.; patients who were suffered from mental illness; patients who were not cooperative.

Treatment methods

In MRM group, all patients were performed biopsy and frozen section examination of sentinel lymph node (SLN) prior to MRM. The biopsy of SLN showed negative, indicating that only lymph nodes in lateral pectoralis minor muscle needed to be cleared away; contrarily, positive SLN indicated that lymph nodes of the whole armpit should be cleared. Negative pressure drainage tube was put in the armpit and chest wall after operation.

In IBRS group, patients were performed IBRS with ELDMF after MRM in lateral position and the position of inframammary fold was marked preoperatively. Spindle-shaped or crescent-shaped incision with width of 6-8 cm was made in subscapular angle for LDMF, whose length was depended on the size of breast incision and size was referred to the healthy breast. Patients' latissimus dorsi and partial fatty, were cut with musculocutaneous flap simultaneously. Then all above-mentioned tissues including muscles, fatties, musculocutaneous flaps were displaced together and then carefully separated out all vessel pedicles on musculocutaneous flap. Most of the muscles connected in the blood vessels were then severed. Finally, the left musculocutaneous flap was transferred to the chest wound. During the operation, the negative pressure drainage tube was placed in patient's dorsal part of chest and armpit incision. Patient's position was changed to suture and fix the wounds, and the musculocutaneous flap was sutured to the skin at the inframammary fold. Nipple plasty was performed on patients three months after the surgery.

Patients received 6-month standardized chemotherapy 7 to 14 days after the surgery in accordance with breast cancer stage (stages II or III) and the chemotherapy regimen was designed on the basis of the severity of patients [9].

Follow-up and observation index

Two groups were compared from these aspects: postoperative adverse reactions including subcutaneous hydrops, skin flay necrosis, restricted functional movement of affected limb, rehabilitation condition, patient satisfaction and life quality.

The observation of rehabilitation condition included length of stay, drainage time (when the drainage volume was less than 15 mL/day, the drainage tube could be removed) and time to first postoperative adjuvant therapy.

Three days after the surgery, self-made satisfaction questionnaire was applied to investigate patient's satisfaction with surgery, including intraoperative discomfort, postoperative effect, adverse reaction, rehabilitation condition, etc. The total score of this questionnaire was 100:81-100 scores, very satisfied; 60-80 scores, satisfied; <60 scores, dissatisfied. Satisfaction = (number of patients with "very satisfied" + number of patients with "satisfied")/ total number of patients *100%.

After 1-year follow-up, patients came back to the hospital and their life quality was evaluated in three aspects. Firstly, patient anxiety was evaluated by State-Trait Anxiety Inventory [10]. Secondly, postoperative external appearance of breast was evaluated via the standard of the reference: poor, patients were not satisfied since the shape of the reconstructed breast varied in size with the healthy one and the differences between the two breasts were obvious after putting on clothes; fair, patients were satisfied as the shape and position of the reconstructed breast were nearly the same as

Table 1. Patients' general information in two groups

Group	IBRS group (n=9)	MRM group (n=15)	t/χ^2	P
Age (year)	56.3±11.0	57.6±12.1	0.61	0.541
Weight (kg)	63.3±22.2	63.1±20.3	0.05	0.960
Stage			0.33	0.955
I	2 (22.2)	3 (20.0)		
IIa	4 (44.4)	7 (46.7)		
IIb	2 (22.2)	3 (20.0)		
IIIa	1 (11.1)	2 (13.3)		
Breast cancer classification			1.49	0.829
Infiltrating ductal carcinoma	1 (11.1)	4 (26.7)		
Intraductal carcinoma	2 (22.2)	2 (13.3)		
Early infiltration of ductal carcinoma	3 (33.3)	5 (33.3)		
Medullary carcinomas	2 (22.2)	3 (20.0)		
Mucinous adenocarcinoma	1 (11.1)	1 (6.7)		

Table 2. Comparison of patients' postoperative adverse reaction in two groups

Group	Subcutaneous hydrops	Skin flay necrosis	Restricted functional movement of affected limb
IBRS group (n=9)	1 (11.1)	2 (22.2)	1 (11.1)
MRM group (n=15)	2 (13.3)	3 (20.0)	2 (13.3)
χ^2	0.019	0.11	1.07
P	0.666	0.737	0.300

Table 3. Comparison of patients' postoperative rehabilitation condition in two groups

Group	Length of stay (d)	Drainage time (d)	Time of initial adjuvant therapy (d)
IBRS group (n=9)	16.2±1.25	8.3±1.05	14.5±1.11
MRM group (n=15)	15.9±1.48	8.1±1.14	14.2±1.32
t	0.20	0.99	1.35
P	0.232	0.322	0.180

Table 4. Comparison of patient satisfaction with postoperative therapeutic effects in two groups

Group	Very satisfied	Satisfied	Dissatisfied	Degree of satisfaction
IBRS group (n=9)	5 (55.6)	3 (33.3)	1 (11.1)	88.9%
MRM group (n=15)	5 (33.3)	2 (13.3)	8 (53.3)	46.7%
χ^2				31.05
P				0.000

the healthy one and there were no differences between the two breasts after putting on clothes; good, patients were very satisfied with the shape and position of reconstructed breast which was almost the same as the healthy one [11]. Thirdly, social situation was evaluated as: satisfied, patients could easily deal with social activities without the influence of breast appearance, psychology, etc.; dissatisfied: patients couldn't adapt to or frighten social activities.

Statistical analysis

SPSS 17.0 software was used to consolidate and analyze relevant data. Measurement data were expressed by mean ± standard deviation; the differences between the two groups were calculated by two independent samples t-test. Count data were expressed by rate (%); the differences between the two groups were tested by χ^2 test or Fisher's exact test. $P<0.05$ was regarded as statistical significance.

Results

General information

Twenty-four patients who underwent MRM were selected in this study, and were divided into two groups: IBRS group (n=9) and MRM group (n=15). There were no statistically significant differences in their general information (all $P>0.05$, **Table 1**).

Adverse reaction

The incidences of postoperative adverse reactions, including subcutaneous hydrops, skin flay necrosis, and restricted functional movement of affected limb in the two group had no statistically significant difference (all $P>0.05$, **Table 2**).

Table 5. Comparison of patients' postoperative life quality in two groups

	IBRS group (n=9)	MRM group (n=15)	χ^2	P
Anxiety			42.23	0.000
Yes	2 (22.2)	12 (80.0)		
No	7 (77.8)	3 (20.0)		
Appearance			108.24	0.000
Good	7 (77.8)	0		
Fair	1 (11.1)	0		
Poor	1 (11.1)	15 (100.0)		
Sociability			39.36	0.000
Satisfied	8 (88.9)	2 (13.3)		
Dissatisfied	1 (11.1)	13 (86.7)		

Rehabilitation condition

Between the two groups, there were no statistically significant differences in the length of stay, postoperative drainage time and time to first postoperative adjuvant therapy (all P>0.05, **Table 3**).

Patient satisfaction

Patient satisfaction with surgery was investigated and statistically analyzed. In IBRS group, 5 cases were "very satisfied", 3 cases "satisfied" and 1 case "dissatisfied" with 88.9% of satisfaction rate. Compared with MRM group (46.7% of satisfaction rate), the difference was statistically significant (P<0.001, **Table 4**).

Quality of life

The appearance evaluation was as follows. In IBRS group, 7 cases were evaluated as "good", 1 case as "fair" and 1 case as "poor". However, in MRM group, the appearances and shapes were comparatively poor, and the differences between the two groups were statistically significant (P<0.001). From the comparison of patients' postoperative psychology state, body shape and sociability in the two groups, it showed that the quality of life of IBRS group was better than those of MRM group (all P<0.001, **Table 5**).

Results of follow-up

Two groups of patients were followed up for 12 months without any local recurrence or metastasis.

Discussion

Currently, the main treatment for breast cancer is radical mastectomy [12]. However, amastia after radical mastectomy has remained great physical and psychological harms to women [13]. IBRS is a vital part in plastic surgery after radical mastectomy, which is able to significantly reduce patient's psychological pressure from physical defect [14]. Meanwhile, the safety of BRS after radical mastectomy has been extensively recognized, with an unchanged survival rate of breast cancer patient [15]. In this study, we found that during the 12-month follow-up, no patient had any local recurrence or metastasis, which was similar to the literature reported before [16].

One of the most widely method for BRS is IBRS with ELDMF. LDMF is a flap commonly used for repairing breast defect due to its big muscle belly, large amount of adipose tissue and simple operative method [17, 18]. We found that patient who underwent IBRS with ELDMF after MRM, had successful operative process and low incidence of adverse reaction. Compared with MRM group, patients in IBRS group had higher patient satisfaction and their quality of life was significantly improved after the surgery. It was similar to the study of Dauplat et al. that the improvement in quality of life of breast cancer patients benefited from IBRS after MRM [19]. At the same time, the advanced patients at stage IIb and IIIa included in this study also received good therapeutic effects. While the previous related studies focused mainly on the breast cancer patients in early stage [20, 21].

However, there may be some slight differences in the results in virtue of the comparatively short follow-up and relatively small sample content. In the future, prospective study will be carried on to confirm with a more adequate sample content and longer follow-up, so that IBRS with ELDMF after MRM can be widely promoted in clinic to improve patients' postoperative effect.

In conclusion, compared with MRM, IBRS with ELDMF after MRM is more conducive to rehabilitation of patients with good clinical efficacy. Therefore, it is worthy of further promotion and application in clinic.

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Disclosure of conflict of interest

None.

Address correspondence to: Benzhong Wang, Department of Breast Surgery, The First Affiliated Hospital of Anhui Medical University, No.218 Jixi Road, Hefei 230022, Anhui Province, China. Tel: +86-0551-62923524; E-mail: wbz0906@163.com

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