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Efficacy and Safety of Immediate Latissimus Dorsi Breast Reconstruction after Breast Cancer Surgery

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Abstract

Background: Most traditional breast reconstruction surgeries require the removal of the patient's own tissue or the use of artificial implants for reconstruction. The improvement of the efficiency and safety of breast reconstruction surgery assumes critical importance for the rehabilitation of breast cancer patients. Immediate latissimus dorsi breast reconstruction surgery, which utilizes the patient's own tissue to perform immediate reconstruction, can address this issue in a targeted manner, avoiding the cumbersome and complex nature of multiple surgeries.

Objectives: To analyze the efficacy and safety of immediate latissimus dorsi breast reconstruction (BR) after breast cancer surgery.

Methods: A total of 91 female patients with breast cancer diagnosed and treated by breast surgery in our hospital from August 2017 to July 2021 were retrospectively analyzed. The patients were assigned to the prosthetic implant group (n=39) and latissimus dorsi group (n=52) according to the method of immediate postoperative BR. The difference in curative effect can be analyzed by comparing the operation time, intraoperative bleeding, postoperative drainage time, and aesthetic evaluation of BR. The safety of postoperative BR was analyzed by comparing the postoperative complications, local recurrence rate, distant metastasis rate of breast cancer, and rehabilitation rate.

Results: There was no dramatic difference in intraoperative bleeding, postoperative drainage time, and rehabilitation rate between the latissimus dorsi and prosthetic implantation groups (P>0.05). Nonetheless, there was a significant difference in operation time, aesthetic evaluation of BR, postoperative complications, local recurrence rate, and distant metastasis rate of breast cancer in the latissimus dorsi group than the prosthetic implant group(P<0.05). In general, the latissimus dorsi group exhibited better therapeutic effects.

Conclusion: Immediate latissimus dorsi BR dramatically affects postoperative breast repair of breast cancer patients and is safer than prosthesis implantation. As an evaluation of their safety and effectiveness, it is necessary to provide patients with more stable and reliable medical outcomes to ensure their surgical safety.

Keywords: Breast cancer, Breast reconstruction, Latissimus dorsi flap, Prosthesis implantation

1. Background

As a malignant tumor with a high incidence rate among women, breast cancer has an annual increasing rate with the environmental changes brought about by social development. From the current age range of incidence, a surging number of young women begin to have breast cancer symptoms (1). surgical resection is often used in the clinical treatment of breast cancer. Total mastectomy is a common surgical method in clinical practice. Breast reconstruction (BR) surgery refers to the use of certain methods and techniques to restore the appearance of breast loss or deformity caused by breast resection surgery in order to improve the psychological and physiological status of patients and improve their quality of life.

The commonly used methods for BR include autologous skin flap, distal skin flap, abdominal wall skin flap, and latissimus dorsi skin flap. Autologous flap reconstruction involves transplanting the patient's own skin, fat, and nipple-areola complex to the breast defect. Distal flap reconstruction involves transplanting flaps from the soft tissues on both sides of the damaged breast to the breast defect and then using areola transplantation to make the new breast more realistic. Abdominal wall flap reconstruction involves transferring an abdominal wall flap (usually a rectus abdominis muscle flap) to a breast defect to form a new breast. Latissimus dorsi flap reconstruction involves implanting the skin and muscles of the latissimus dorsi muscle as a donor to the breast defect.

Nonetheless, breast defects after surgical resection will cause psychological damage to patients. Therefore, preserving perfect breasts has become a major issue that breast surgeons begin to pay attention to in surgery and postoperative recovery (2). The BR surgery emerged to improve the quality of life of patients with breast cancer after surgery. It is known that the first BR surgery occurred in 1977; therefore, the method of applying autologous tissue to patients' BR gradually began to be widely used in clinics (3-4). Some studies have proposed a new BR technology, given the defects of domestic research on BR after breast cancer surgery. The new technology is used to realize the transplantation of autologous tissue.

The final efficacy evaluation is similar to the conventional operation (5). Nevertheless, there is still

a gap in the application of BR surgery technology between China and other countries at present. On the one hand, it is reflected in the proportion of BR surgery. On the other, it is reflected in its treatment effect (6). Therefore, the efficacy of immediate postoperative BR for the latissimus dorsi muscle was thoroughly analyzed to improve the efficacy of postoperative BR for cancer and the quality of life of postoperative patients. The safety of BR was also evaluated to provide ideas for the prevention of BR and complications after breast cancer surgery in China.

Zehra S et al. studied the health-related quality of life (HR QoL) results of breast cancer survivors who received BR, breast-conserving surgery, or mastectomy. They reported that the BR group showed better physical health and body image, and there was no significant difference in social, emotional, global, and sexual health between the two groups. No clear evidence suggests that BR is superior to breast-conserving surgery in all domains. Therefore, women who choose breast reconstruction or breast-conserving surgery may report much better quality of life results than mastectomy (7).

Chang EI et al. discussed the treatment of patients with breast cancer-related lymphedema. Patients can undergo breast reconstruction and lymphedema treatment simultaneously. The study compared patients who underwent vascular inguinal lymph node metastasis and lymphatic vein anastomosis with those who only underwent lymph node metastasis. The results indicated that the combination of all the above methods can significantly improve the condition. This prospective study broke the previous practice of only lymph node metastasis and provided treatment references for breast cancer patients (8). Nealon K et al. compared the safety and risk factors of BR cohorts before and after extracorporeal direct implantation. The results of the mentioned study pointed out that the safety indicators of the two implantation methods were equivalent. Therefore, direct pre-implantation BR can serve as a safe alternative to direct post-implantation breast reconstruction. For patients with firm skin flaps after mastectomy, direct implantation, and reconstruction before mastectomy can be considered to eliminate a range of motion problems and pain (9).

Traditional BR methods require multiple surgeries, resulting in large surgical wounds, pain, and long recovery time, posing a significant psychological and physiological burden on patients. In recent years, immediate latissimus dorsi BR has become an emerging method that can be performed simultaneously with breast resection surgery, reducing the number of surgeries and making it more convenient and comfortable for patients. As an evaluation of its safety and effectiveness, it is necessary to provide patients with more stable and reliable medical outcomes, ensuring their surgical safety.

Most traditional breast reconstruction surgeries require the removal of the patient's own tissue or the use of artificial implants for reconstruction. The surgical complexity is high, the surgical time is long, and several follow-up examinations and repairs are required after the surgery.

2. Objectives

Therefore, improving the efficiency and safety of breast reconstruction surgery is of utmost importance for the rehabilitation of breast cancer patients. Immediate latissimus dorsi breast reconstruction surgery can address this issue in a targeted manner. It utilizes the patient's own tissue to perform immediate reconstruction during breast resection surgery, avoiding the cumbersome and complex nature of multiple surgeries. This surgical method is gradually gaining recognition in the medical community; however, its efficacy and safety still require more clinical research and practical verification. The study on the efficacy and safety of immediate latissimus dorsi breast reconstruction after breast cancer surgery is helpful to explore the efficiency and safety of the surgery, promote the whole autologous tissue reconstruction surgery, and protect the life quality, as well as physical and mental health, of breast cancer patients.

3. Methods

3.1. General information

The present study was performed from August 2017 to July 2021. A total of 91 female patients diagnosed and treated with breast cancer during breast surgery in Hospital A were selected, and an intervention comparative test was conducted. A number of 39 patients underwent breast replacement immediately after breast cancer surgery, and 52 patients underwent latissimus dorsi replacement immediately after surgery. The patients were assigned to the prosthesis implantation and latissimus dorsi groups according to the BR method. The inclusion criteria were as follows: (1) Patients with breast cancer who were initially diagnosed by pathology and had no metastasis, (2) Non-papillary areola tumor, (3) non-invasion of pectoralis major fascia by the tumor, (4) surgical tolerance and provision of the informed consent after knowing the operation method and advantages and disadvantages, and (5) undergoing adjuvant therapy after the operation. On the other hand, the exclusion criteria entailed (1) important organ dysfunction; (2) surgical intolerance; (3) presence of coagulation disorders; (4) Pregnancy or lactation, and (5) lost postoperative follow-up. The study was carried out with the consent of the ethics committee of our hospital. The clinical data of patients with immediate BR after surgery for sexual breast cancer included age, body mass index

(BMI), history of diabetes, previous chest and back surgery, pathological stage, N-acetylcysteine (NAc) C retention, surgical method, time, amount of bleeding, occurrence of early complications, and satisfaction score.

3.2. Research methods

3.2.1. Surgical method of prosthesis implantation and reconstruction

In BR with prosthesis implantation, silicone prostheses of approximate size are mainly designed for patients with sentinel lymph node metastasis, according to the patient's breast information. Firstly, the subcutaneous glands were excised from the areola edge to the outside of the mammary gland, and thin layers of tissue were reserved to ensure the blood supply of the nipple. During the gland resection, the pectoralis major fascia was preserved, and the pectoralis major fascia was then stripped to remove most of the pectoralis major origin. After determining the appropriate size of the prosthesis, a drainage tube is placed, and the prosthesis is gradually implanted and retained for drainage. After adjusting the position of the prosthesis, the pectoral fascia is sutured, the prosthesis is wrapped, and the incision is closed (10-12).

3.2.2. Surgical method of latissimus dorsi reconstruction

Sentinel lymph node biopsy was performed on patients. When patients had sentinel lymph node metastasis, BR with prosthetic implants could not be used. The method of subcutaneous gland resection was the same as that of prosthesis implantation. During the operation, the skin was cut according to the preoperative design incision, and the skin flap was separated. To select the latissimus dorsi with adipose tissue, separate the tissue to the scapula, establish a subcutaneous tunnel, and stop bleeding in the back. Thereafter, to fix the latissimus dorsi flap around the chest wall, perform breast plasticity, stop bleeding fully, place a drainage tube, and close the incision after the flap is free of ischemia (13-15).

3.3. Observation indicators

General data of all patients, including age and home address, were collected to record the surgical time and intraoperative bleeding during the BR period, as well as the postoperative drainage time of the patients. The drainage tube was pulled out when the drainage fluid was less than 20ml within three days. The time of adjuvant therapy after BR was collected. The types of postoperative complications were collected, and the incidence of complications was analyzed. The prognosis of patients after BR is collected, including rehabilitation rate and mortality. After BR, the patient was evaluated for appearance aesthetics by the Harris scale. The Harris Score is a commonly used evaluation tool for evaluating the treatment effectiveness of hip joint diseases.

The aesthetic evaluation of reshaping breast morphology was evaluated using the Harris evaluation table: severe deformation: the appearance and size of the reconstructed breast were inconsistent with those of the healthy breast. General evaluation: The appearance and size of breast reconstruction and the healthy side breast are asymmetrical, and there is a significant difference in appearance after dressing, which is not satisfactory to the patient; Good evaluation: The appearance, size, and position of the reconstructed breast are basically the same as those of the healthy breast. There is no significant difference in appearance after dressing, and the patient is relatively satisfied; Excellent evaluation: The appearance and size of the breast reconstruction and the healthy side breast are basically the same, and the patient is very satisfied. The results of the Harris scale can help doctors judge the treatment effectiveness of patients' diseases and be used for clinical research and the comparison of treatment plans. After BR, the patient's bilateral breasts were the same in size and appearance, and the patient was satisfied with the surgical effect. The evaluation was excellent, and the scoring standard are [90, 100].

After reconstruction, the size and appearance of bilateral breasts were basically the same. There was no dramatic difference after dressing. The patients were evaluated as good after they were satisfied. The scoring standard are [80, 89]. After reconstruction, the size and appearance of bilateral breasts are inconsistent. The patient can still observe the difference in bilateral breasts after dressing and is evaluated as average after dissatisfaction. The scoring standard are [70, 79]. After BR, the patients' bilateral breasts have dramatic differences, and the reconstructed breast is severely deformed. The evaluation is poor, and the scoring standard are [0, 69]. The postoperative follow-up time set for the study was 1.33-102 months, with a median follow-up time of 25.3 months and a mean follow-up time of 37.39±36.1 months. The calculation method for distant metastasis rate is:

$$\text{Distant metastasis rate} = \frac{\text{number of distant metastasis cases}}{\text{total number of diagnosed patients}} * 100$$

3.4. Statistical methods

All the collected data were statistically analyzed by Excel performance data, and SPSS (version 24.0) was used for household statistics. Normal distribution test and independent sample t-test were used to compare the data of operation age, BMI, intraoperative bleeding, and pathological stage. The data that do not conform to the normal distribution shall be tested by percentile quantile and nonparametric tests. Qualitative variables are represented by frequency and checked by the Chi-square test, such as past surgical history, surgical

methods, complications, and satisfaction. Univariate and multivariable analyses were performed using binary metalogic regression, and P<0.05 was considered statistically significant.

4. Results

4.1. Clinical characteristics of patients

Table 1 displays the comparison results of clinical data of the two groups during BR. Based on this table, there is no dramatic difference between the latissimus dorsi reconstruction group and the prosthesis implantation group in terms of age, Body Mass Index (BMI), and other general data (*P*>0.05). At the same time, the tumor-node-metastasis (TNM) stage, pathological type, and the number of lymph node metastasis are compared. As a results, there was no difference in clinical indicators of patients (*P*>0.05).

4.2. Effect analysis of BR in two groups

The BR operation process is divided into three stages: Stage 1 for preoperative preparation, stage 2 for intraoperative transplantation, and stage 3 for postoperative sutures. The operation preparation time of the prosthesis implantation group was dramatically longer than that of the latissimus dorsi group (*P*<0.05). At the stage of intraoperative transplantation, the operation time of patients in the prosthesis transplantation group was shorter than that in the latissimus dorsi muscle group (*P*<0.05) since the procedure of latissimus dorsi skin flap peeling was omitted in the prosthesis implantation. In the postoperative suture stage, the operation time of patients in the latissimus dorsi group was dramatically longer than that of patients in the prosthesis transplantation group. The operation time of the latissimus dorsi group was slightly longer than that of the prosthesis implantation group (*P*<0.05).

Table 2 illustrates the results of bleeding volume, postoperative drainage time, and postoperative adjuvant treatment time of the two groups during BR surgery. The results show that there is no dramatic difference in bleeding volume (*P*>0.05). The comparison of postoperative drainage time demonstrated no dramatic difference in time between the prosthesis implantation group and the latissimus dorsi group (*P*>0.05). Comparing the time of postoperative adjuvant therapy demonstrated that the time of postoperative adjuvant therapy in the latissimus dorsi group was dramatically shorter than that in the prosthesis implantation group*(P<0.05)*.

Table 1. General information of patients

		Prosthesis implantation(n=39)	Latissimus dorsi muscle(n=52)	*P value**
Age	>40 years	18 (46%)	25 (48%)	0.856
	≤ 40 years	21 (53%)	27 (52%)	
BMI	<27 kg/m²	17 (44%)	22 (43%)	0.903
	≥27 kg/m	22 (56%)	30 (57%)	
TNM staging	0	6 (15%)	7 (13%)	0.089
	I	19 (49%)	14 (27%)	
	II	12 (31%)	22 (43%)	
	III	2 (5%)	9 (17%)	
Pathological type	Ductal carcinoma in situ	6 (15%)	7 (13%)	0.440
	Invasive ductal / lobular carcinoma	29 (75%)	43 (83%)	
	Invasive special carcinoma	4 (10%)	2 (4%)	
Diabetes		2(5%)	3(5%)	0.049
Number of lymph node metastases	0	31 (80%)	35 (67%)	0.198
	≥1	8 (20%)	17 (33%)	

* Chi-square test

Table 2. Comparison of bleeding volume, incidence rate of diabetes, postoperative drainage time, and postoperative adjuvant therapy time

Index	Prosthesis implantation group(n=39)	Latissimus dorsi group(n=52)	*P value**
Bleeding volume(ml)	10.95± 5.21	18.82± 20.75	0.064
Postoperative drainage time(days)	10.93± 5.21	20.55±9.73	0.052
Postoperative start of adjuvant treatment time(days)	27.13± 7.21	20.55± 9.82	0.011

* Independent sample t test

Table 3 and Figure 1 show patients' breast aesthetic evaluation results before, 1 day, 7 days, and 30 days after surgery. It can be observed that the scores of both groups demonstrated a trend of first decreasing and then increasing, while the scores of the latissimus dorsi group were relatively higher in the later stage. Table 3 and Figure 2 show the subjective evaluation results of two groups of patients after different BR surgeries. Different evaluation time points were taken at 1 day, 7 days, and 30 days after surgery using patient satisfaction as the evaluation indicator. It can be detected that the satisfaction scores of both groups showed a downward trend, with the latissimus dorsi group showing a slower decline rate and a relatively higher score in the later stage.

Table 3. Satisfaction assessment of breast reconstruction surgery

Evaluating indicator	Point of time	Prosthesis Implantation Group(n=39)	latissimus dorsi group(n=52)	Between group P value*
Breast aesthetic evaluation	1 day after surgery	77.45±1.31	76.21±1.65	0.063
	7 day after surgery	81.23±1.05*	83.17±0.98*	0.051
	30 day after surgery	85.72±1.32*#	89.66±1.03*#	0.023
Patient satisfaction evaluation	1 day after surgery	84.35±1.43	83.79±1.51	0.071
	7 day after surgery	80.17±1.47*	82.11±0.97*	0.048
	30 day after surgery	75.72±1.12*#	81.25±1.27*#	0.016

* Significant difference compared to the first day (P<0.05), # Significant difference compared to the seventh day (P<0.05), one wat ANOVA

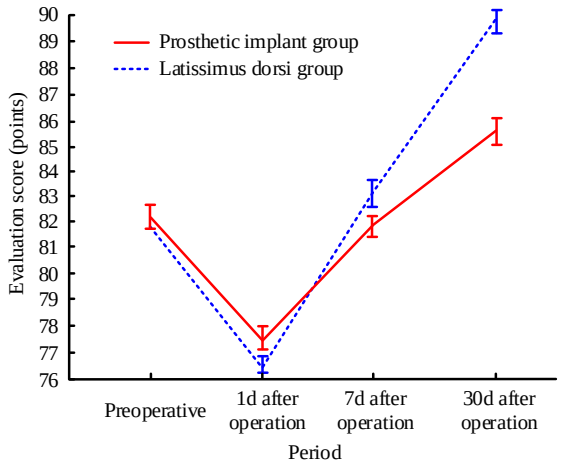

Figure 1. Results of the cosmetic evaluation

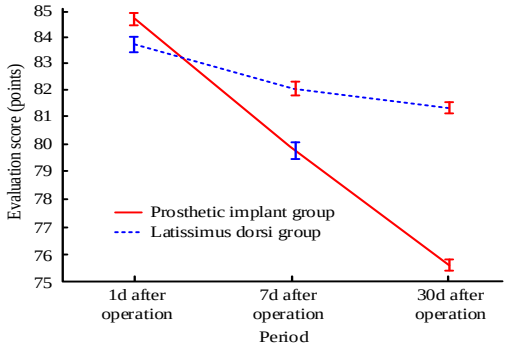

Figure 2. Surgical satisfaction evaluation results of two groups of patients at different time points

4.3. Safety analysis of breast reconstruction

Table 4 shows the complications of the two groups of patients and the implant group after BR surgery, including incision infection, NAC necrosis, flap necrosis, and prosthetic dysfunction. The incidence of complications in the latissimus dorsi group was lower than that in the implant group (P<0.05). Figure 3 shows the comparison of local recurrence rates among patients. Research using adjuvant online prediction tools can predict the local recurrence rate of patients based on their personal and tumor characteristics. The prediction is mainly based on basic information, such as the patient's age, tumor size, lymph node status, histological grading, and ER/PR/HER2 receptor status.

As illustrated in Figure 3, the local recurrence rate increases over time in the implant group. In the latissimus dorsi group, the local recurrence rate also showed an upward trend over time. The Comparison of local recurrence rates at different time points within the group revealed a statistically significant difference 30 days after surgery in comparison with the 1st day after the surgery (P<0.05). Comparing the differences in local recurrence rates, it can be observed that over time, the local recurrence rate of patients in the implant group gradually increased compared to those in the latissimus dorsi group. After 12 days, there was a significant difference in the local recurrence rate (P<0.05).

Table 5 shows the differences in distant metastasis rates of cancer. Compared with the rate of distant metastasis of breast cancer in different age groups, only the 40-49-year-old age group had a statistically significant difference (P<0.05). The

Table 4. Complications after BR in both groups

Complication	Prosthesis implantation(n=39)	Latissimus dorsi muscle(n=52)	*P* value*
Hematoma / seroma	0 (0%)	2 (3.85%)	
Wound infection	3 (7.69%)	2 (3.85%)	
NAC necrosis	3 (7.69%)	0 (0%)	
Flap necrosis	2 (5.13%)	1 (1.92%)	
Prosthetic disorder	4 (10.26%)	0 (0%)	0.031
Dilator dysfunction	0 (0%)	0 (0%)	
Fat liquefaction	0 (0%)	0 (0%)	
Abdominal hernia	0 (0%)	0 (0%)	
Total	12 (30.77%)	5 (9.62%)	

* Chi-square test

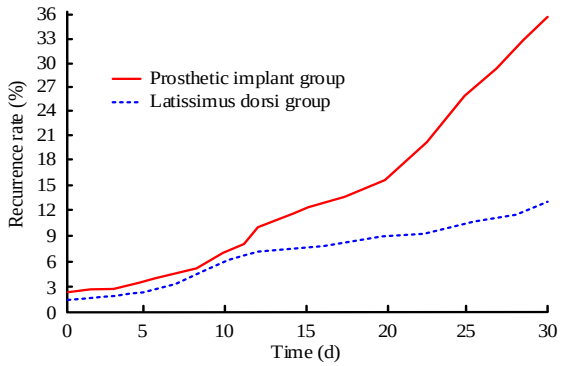

Figure 3. Difference in local recurrence rate at different time points after operation

Table 5. Differences in distant metastasis rate of breast cancer

Age group(years)	Prosthesis implantation(n=39)	Latissimus dorsi muscle(n=52)	*P* value*
20~29	1 (10.00%)	2 (15.38%)	0.073
30~39	2 (7.69%)	2 (6.25%)	0.058
40~49	5 (16.13%)	3 (9.09%)	0.005
50~59	2 (10.53%)	1 (4.00%)	0.053

* Chi square test

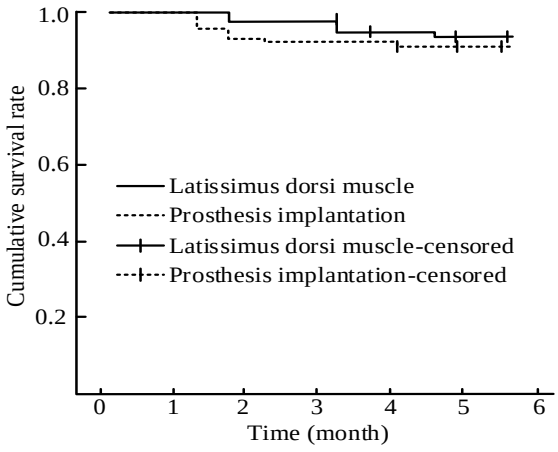

Figure 4. Follow up results of rehabilitation rate in two groups

survival curve is used to analyze the recovery rate of patients during postoperative reconstruction, as displayed in Figure 4. The follow-up survey of patients with prosthetic implant BR illustrated that over time, the recovery rate of this group of patients decreased to 92.34% within six months. The follow-up survey of the latissimus dorsi group showed that the postoperative recovery rate of patients decreased to 93.76% within six months (P<0.05).

4.4. Analysis of influencing factors

In order to improve the efficacy and safety of BR after breast cancer surgery, the factors affecting complications were analyzed to improve the safety of surgery. During the study, the age, BMI, diabetes, reconstruction type, donor source, implant type, intraoperative blood loss, and operation duration of patients were compared by single-factor analysis to test whether the difference was statistically

significant. The difference should be included in the multivariate logical analysis if it is statistically significant. In logical analysis, based on autologous tissue breast reconstruction, various factors affecting the reconstruction effect were analyzed.

The univariate analysis of postoperative complications in BR surgery is exhibited in Table 6. As displayed in this table, the risk factors affecting the efficacy and safety of BR treatment after breast cancer surgery are diabetes, BMI, intraoperative bleeding, and reconstruction type. It can be observed that the above indicators are not risk factors affecting the efficacy and safety of BR treatment after breast cancer surgery. Based on multivariate analysis, BMI, intraoperative bleeding, and reconstruction type are independent risk factors that affect the efficacy and safety of postoperative BR for cancer.

Finally, the ROC curve was used to analyze the impact of BMI, intraoperative bleeding, and reconstruction types on the efficacy and safety assessment of BR treatment after breast cancer surgery, as shown in Figure 5. This figure depicts that the area under the ROC curve for BMI, intraoperative bleeding, and reconstruction types is greater than 0.5, thereby evaluating the safety of BR.

Table 6. Single factor analysis of complications after BR

Index	*P*	OR	95%CI
Diabetes (yes *vs.* no)	0.017	1.957	(1.403~2.117)
Age (>40 years *vs.*<= 40 years)	0.662	1.180	(0.921~1.665)
BMI(<27 kg/m^2*vs.*<=27 kg/m^2)	0.049	3.405	(3.054~3.723)
Bleeding volume	0.038	1.113	(1.623~2.327)
Operation time (>180min *vs.* ≤ 180min)	0.055	2.264	(0.945~2.517)
Reconstruction type (latissimus dorsi *vs.* prosthesis implantation)	0.047	6.557	(5.773~7.016)

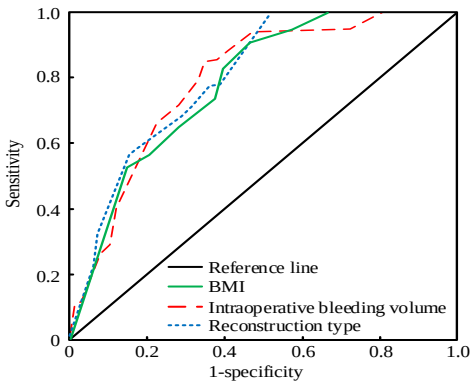

Figure 5. ROC curve analysis of independent risk factors

5. Discussion

Breast cancer is one of the malignant tumors that affect women's normal life. With the constant advances of medical technology, surgical resection of cancer has been widely applied in clinical practice. Nevertheless, the negative psychological impact of surgical resection can also lead to negative emotions in female patients (16). To alleviate the psychological anxiety of female patients after mastectomy, BR surgery after mastectomy has been widely used. The BR surgery aims to reconstruct the breast after mastectomy with the help of the existing surgical anesthesia effect and repair the chest defect after mastectomy by transplanting other tissues or using prosthesis implantation. The above two methods are also relatively mainstream BR surgical methods (17-18).

This study analyzed the efficacy and safety of latissimus dorsi breast reconstruction after breast cancer surgery and compared it with prosthesis implantation. The research results indicated that using the latissimus dorsi muscle for breast reconstruction is more advantageous in terms of surgical time, aesthetic evaluation, postoperative adjuvant treatment time, and patient satisfaction. In addition, the incidence of complications, local recurrence, and distant metastasis of breast cancer in the implant group were higher than those in the latissimus dorsi group. Therefore, patients with breast cancer can consider the use of latissimus dorsi muscle BR when choosing BR surgery method to achieve better clinical efficacy and safety.

The research results of Baldwin A et al. also indicated that adding autologous tissue to BR can make the postoperative breast contour of patients more natural; moreover, autologous tissue repair can accelerate postoperative recovery and benefit postoperative radiotherapy (19). From the current research status, autologous tissue BR has become a common surgical method in clinical practice. The team of Flanagan MR and Persing S found that the latissimus dorsi BR is simpler and has a higher success rate (20-21). This is similar to the conclusions drawn in this study; nonetheless, this

study put a greate emphasis on clinical efficacy and safety of postoperative patients.

A wide array of studies have focused on analyzing the postoperative rehabilitation effects of patients using the latissimus dorsi muscle, and there is a dearth of studies on the occurrence, prevention, and treatment of postoperative complications. Therefore, while analyzing the efficacy of latissimus dorsi BR, this study also analyzed the postoperative complications of patients and proposed the factors affecting complications to improve the clinical efficacy of latissimus dorsi BR. When analyzing the efficacy of latissimus dorsi BR, this study compared the surgical time, bleeding volume, aesthetic evaluation, and satisfaction evaluation between implanted and latissimus dorsi patients.

The surgical time of the implant group was slightly lower than that of the latissimus dorsi group. Tests demonstrated that this difference is statistically significant. There is a comparison of bleeding volume, postoperative drainage time, and postoperative adjuvant treatment time. It demonstrates no significant difference in bleeding volume and postoperative drainage frequency between the implantation group and the latissimus dorsi group; nonetheless, there is a significant difference in postoperative auxiliary treatment time.

The postoperative adjuvant treatment time of the latissimus dorsi group was lower than that of the implant group since the latissimus dorsi muscle BR uses autologous tissue for BR. Compared to prosthesis implantation and latissimus dorsi, BR is more suitable for body cell tissue and reduces the time of postoperative adjuvant treatment. This is consistent with the research results of the studies by Nayyar A et al. and Yfantis A et al. while Houvenaeghel G et al. and Francis DM also conducted similar studies and arrived at similar conclusions (22-25).

In aesthetic evaluation, the results of this study revealed that the aesthetic evaluation scores of patients in the implant group displayed an upward trend with the passage of postoperative time. The aesthetic evaluation scores of patients in the latissimus dorsi group also exhibited an upward trend. The score growth rate of patients in the latissimus dorsi group was higher than that in the implant group. In agreement with the results of the study by Riccardo P et al., Grubstein A et al. reached a similar conclusion and analyzed that using the latissimus dorsi muscle for BR can improve patients' natural sagging beauty (26, 27). In the evaluation of patient satisfaction, the satisfaction of patients in the implant group showed a sharp downward trend, while the satisfaction of patients in the latissimus dorsi group displayed a slow downward trend. This conclusion is similar to the conclusion obtained by Zhu L et al. (28).

In the safety evaluation of BR, this study evaluated and analyzed the complications, local recurrence rate, distant metastasis rate of breast cancer, and postoperative recovery rate of BR. The incidence of complications in the implantation group was 30.77%, much higher than that in the latissimus dorsi group (9.62%). In line with the present research, the study by Mak JC et al. indicated that implant placement could, to some extent, reject autologous tissue, affecting its division. It can affect the body's immune cells in severe cases, leading to complications (29). In addition, consistent with the results of this study, the research by Kalvala J et al. pinpointed that the local recurrence rate and distant metastasis rate of breast cancer in the implant group were higher than those in the latissimus dorsi group (30). In the analysis of the recovery rates of the two groups of patients, the recovery rate of the latissimus dorsi group was slightly higher than that of the implant group during follow-up, confirming the conclusion drawn by Miller ME et al. (31). Therefore, patients with breast cancer can consider using latissimus dorsi muscle BR when choosing BR surgery method to achieve better clinical efficacy and safety.

Although this study conducted a comprehensive analysis of immediate latissimus dorsi breast reconstruction after breast cancer surgery, it still had some limitations. Firstly, the study only considered this single disease type, and the conclusions obtained from the study were not applicable to other cancer diseases. In addition, due to limitations in research funding, scale, and other aspects, the study was unable to provide long-term follow-up analysis of patients. At the same time, due to the relatively limited number of samples collected and the need for all samples to meet inclusion criteria, the study may lack some universality from a social perspective. Improving the size of the sample set while expanding the inclusion criteria and enhancing the social universality of the study is also the future research direction.

6. Conclusion

In conclusion, immediate latissimus dorsi BR after breast cancer resection has a dramatic effect. Compared to immediate BR with prosthesis implantation, the incidence of complications, recurrence rate, and metastasis rate of breast cancer are lower. In addition, the research proved that BMI, intraoperative bleeding volume, and reconstruction type are independent risk factors for complications after BR. Therefore, to improve the safety of BR, the above factors can be used for prediction and analysis. The general data of patients in the study are relatively restricted, imposing limitations to a certain extent. To eliminate external interference in the follow-up study, it is necessary to analyze a number of basic indicators of patients.

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Footnotes

Conflicts of Interest: The authors declare that they have no conflict of interest.
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