

Original Article

Clinical effect of trans-areolar resection and minimally invasive mammotome biopsy in the treatment of breast fibroadenoma and its impact on the quality of life of patients

Qi Wang^{1*}, Jianping Zheng^{2*}, Yufeng Ren², Hui Xu¹

¹Department of Mammary Health Care, Liaocheng Dongchangfu Maternal and Child Health Hospital, Liaocheng 252000, Shandong Province, China; ²Department of Ultrasound, Dongchangfu Hospital of Traditional Chinese Medicine, Liaocheng 252000, Shandong Province, China. *Equal contributors and co-first authors.

Received February 23, 2021; Accepted May 29, 2021; Epub May 15, 2022; Published May 30, 2022

Abstract: Objective: To explore the effects of trans-areolar resection and minimally invasive mammotome biopsy on therapeutic effect. Methods: A total of 131 patients with breast fibroadenoma were selected as the research subjects. Among them, 58 patients were treated by trans-areolar resection and included in group A (GA), and 73 patients were treated by minimally invasive mammotome biopsy and included in group B (GB). The changes of blood pressure, intraoperative blood loss and incision length in patients were detected before anesthesia, during resection and after operation. The pain score and operation time of patients were analyzed. The incidence of postoperative complications and the therapeutic effect were compared in the two groups. The Vancouver Scar Scale (VSS) was used to assess scar condition of patients in the two groups, and the lower the score, the more normal the skin. After operation, the satisfaction with breast appearance was assessed, and the quality of life was compared between the two groups. Results: During resection, DBP and SBP indexes of blood pressure in GA were lower than GB. The intraoperative blood loss in GA was greater than GB, and the incision length was also greater than GB. The VAS pain score in GA was higher than GB ($P<0.05$), and operation time was also longer than GB. The incidence of complications in GB was significantly lower than GA. The total effective rate in GB was significantly higher than GA. The scar score in GA was significantly higher than GB. The satisfaction in GB was significantly higher than GA, and the quality of life in GB was higher than GA. All $P<0.05$. Conclusion: Compared with trans-areolar resection, minimally invasive mammotome biopsy has a better therapeutic effect on patients with breast fibroadenoma, and it can improve their quality of life more significantly.

Keywords: Trans-areolar resection, minimally invasive mammotome biopsy, breast fibroadenoma

Introduction

Breast fibroadenoma is a common benign tumor, accounting for more than 70% of benign breast lesions [1]. It is caused by the abnormal sensitivity of breast fibroblasts to estrogen [2]. It is a painless, unilateral, benign (non-cancerous) breast tumor and solid tumor, without effusion [3]. The disease can develop in women of any age after puberty, but the incidence is mostly between 20 and 30 years old [4]. In recent years, with the increase of people's attention to physical health, the detection rate of breast fibroadenoma has gradually increased [5]. Most patients with breast fibroadenoma will show obvious breast lumps clinically,

which are detected in medical examination or self-examination [6], or patients occasionally experience breast pain. If there is no timely intervention, the disease will worsen, and a few patients may undergo malignant transformation, which will affect the normal development of the breast and endanger the health of patients [7]. Therefore, timely treatment and effective treatment methods are the key to promote the recovery of patients' health and improve their quality of life.

At present, the clinical treatment methods include drug treatment and surgical treatment for breast fibroadenoma [8]. Because there are no obvious symptoms in the early stages of the

Treatment of patients with breast fibroadenoma

disease, most patients need to undergo surgery upon examination [9]. However, the traditional surgical treatment (i.e. fibroadenoma resection by incision) has great trauma, which will lead to scar formation, reduction of breast volume and the possibility of nipple and areola deformation or displacement [10], and it will also cause poor prognosis and increase the psychological burden of patients to a certain extent [11]. With the increasingly advanced medical technology, people's pursuit of beauty is getting higher and higher. While restoring patients' health, clinicians also pay more and more attention to patients' demand for beauty, especially sensitive parts such as women's breasts [12]. Therefore, a trans-areolar resection cuts a small area at a relatively hidden and dark skin color, which meets the needs of patients for beauty [13]. At the same time, we have also found that many studies have shown that minimally invasive mammotome biopsy has the characteristics of having minor trauma and high safety, which is widely used in the treatment of breast fibroadenoma [14]. However, there are still only a few clinical research documents about the therapeutic effect of trans-areolar resection and minimally invasive mammotome biopsy on patients with breast fibroadenoma, and there is still no exact research report. Therefore, this study was designed to analyze and explore the two treatment methods, so as to provide reliable reference and guidance for clinical diagnosis and treatment of breast fibroadenoma in the future.

Materials and methods

Collection of patients' data

From August 2017 to May 2019, 131 patients with breast fibroadenoma admitted to our hospital were selected as the research subjects for prospective analysis. Among them, 58 patients were treated by trans-areolar resection and included in GA, and the other 73 patients were treated by minimally invasive mammotome biopsy and included in GB. The average age of patients was (40.4±19.8). All patients were classified as Grade 3, Grade 4 and Grade 4a in line with color doppler Ultrasound BI-RADS rating, including 9 cases in Grade 4a, 1 cases in Grade 4 and 121 cases in Grade 3. Most of the patients were left or right breast fibroadenoma or bilateral breast fibroadenoma, while some patients

were accompanied by other side breast adenosis, hyperplasia and intraductal papilloma, and one patient had left breast invasive ductal carcinoma and right breast fibroadenoma. This study was approved by the Medical Ethics Committee of our hospital (No. NCT01456826).

Inclusion and exclusion criteria

Inclusion criteria: All patients were diagnosed as having breast fibroadenoma by breast X-ray, breast ultrasound and pathological examination, and they were suitable for trans-areolar resection and minimally invasive mammotome biopsy. The patient data was complete, and they agreed and signed the informed consent agreement.

Exclusion criteria were as follows: Comorbid with other cardiovascular and cerebrovascular diseases and organ dysfunction, those with mental, language and consciousness disorders, surgical contraindication, and pregnant and lactating patients.

Surgical methods

GA: The location of the breast mass was determined by ultrasound examination. The patient was placed in supine position for local disinfection and anesthesia. Then, an arc incision was made around the areola. The skin and subcutaneous tissue were separated and cut off gradually, and then the surrounding tissues and lesions were peeled off. The tumor was completely exposed and then removed. Finally, the bleeding was stopped and the wound was sutured.

GB: The location of the breast mass was determined. The patient was placed in a horizontal position for local disinfection and anesthesia. The best puncture point was selected and an incision of about 5 mm in length was made with a sharp knife. Under the guidance of the ultrasound knife, the rotary knife was pierced under the fibroadenoma and it was completely removed by negative pressure suction. After excision, the surgical site was compressed for hemostasis. After the complete excision, the local tissue was compressed and bandaged.

Outcome measures

The changes of blood pressure, intraoperative blood loss and incision length of patients were

Treatment of patients with breast fibroadenoma

Table 1. Baseline data [n (%)]

	GA (n=58)	GB (n=73)	t or χ^2	P
Age/years old	41.4±17.5	40.3±19.6	0.334	0.739
BMI (KG/cm ²)	31.52±3.05	31.46±4.22	0.091	0.928
Living environment			0.032	0.858
Town	39 (67.24)	48 (65.75)		
Rural	19 (32.76)	25 (34.25)		
Educational background			0.098	0.755
High school or above	35 (60.34)	46 (63.01)		
Below high school	23 (39.66)	27 (36.99)		
Marital Status			0.039	0.844
Yes	43 (74.14)	53 (72.60)		
No	15 (25.86)	20 (27.40)		
Fertility or not			0.074	0.786
Yes	41 (70.69)	50 (68.49)		
No	17 (29.31)	23 (31.51)		
Course of disease	9.16±3.97	9.25±4.03	0.128	0.899
Nation			0.039	0.843
Han nationality	51 (87.93)	65 (89.04)		
Minority nationality	7 (12.07)	8 (10.96)		

detected before anesthesia, during resection and after operation. The pain score and operation time of patients were analyzed. The incidence of postoperative complications and the therapeutic effect were compared in the two groups [13]. The Vancouver Scar Scale (VSS) was used to assess the scar condition of patients in the two groups, and the lower the score, the more normal the skin [15]. After operation, the satisfaction with breast appearance was assessed, and the quality of life was compared between the two groups.

Statistical methods

All statistical analyses of the experimental results were performed using SPSS 24.0 statistical software (Shanghai Yuchuang Network Technology Co., LTD.). All the graphical results were drawn by Graphpad 8 (Shenzhen Tianruiqi Software Technology Co., Ltd.). The counting data were expressed in (%), and Chi-square test was used for comparison between groups. The measurement data were expressed as (mean number ± standard deviation), and t test was used for comparison between groups. Single factor analysis of variance and LSD back testing were used for comparison among multiple groups. Repetitive measurement and analysis of variance and Bonferroni back testing were used for comparison among multiple

time points. The difference was statistically significant with $P < 0.05$.

Results

Baseline data

There was no difference in age, BMI, living environment, educational background, marital status, fertility or not, course of disease and nationality between the two groups ($P > 0.05$, **Table 1**).

Changes of intraoperative blood pressure in the two groups

The changes of blood pressure DBP and SBP indexes were detected before anesthesia, during resection and after operation. The results showed that there was no difference in blood pressure DBP and SBP indexes between the two groups before anesthesia ($P > 0.05$),

and there was no difference in blood pressure DBP and SBP indexes after operation ($P > 0.05$), but the blood pressure DBP and SBP indexes in GA were lower than those in GB at the time of resection, with statistical differences ($P < 0.05$) (**Figure 1**).

Comparison of the operative situation between the two groups

The intraoperative blood loss, incision length, pain score, operation time and other operative situations were compared between the two groups. The results showed that the intraoperative blood loss in GA was greater than that in GB ($P < 0.05$), and the incision length was also greater than that in GB ($P < 0.05$). The VAS pain score in GA was higher than that in GB ($P < 0.05$), and operation time was also higher than that in GB ($P < 0.05$). There were statistical differences (**Figure 2**).

Incidence of postoperative complications in the two groups

The incidence of postoperative complications was compared between the two groups. The results showed that the incidence of postoperative complications in GA was 27.59%, and that in GB was 6.85%. The incidence of complication in GB was significantly lower than that

Treatment of patients with breast fibroadenoma

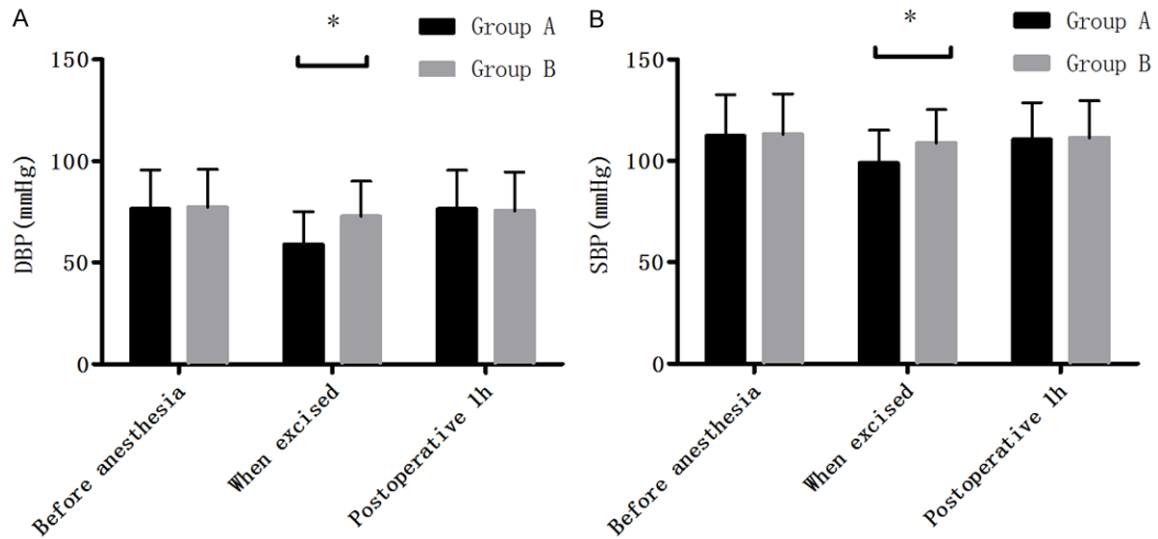


Figure 1. Changes of intraoperative blood pressure in the two groups. A. Changes of blood pressure DBP index in the two groups before anesthesia, during resection and after operation. B. Changes of blood pressure SBP index in the two groups before anesthesia, during resection and after operation. * $P < 0.05$ Group B compare with Group A.

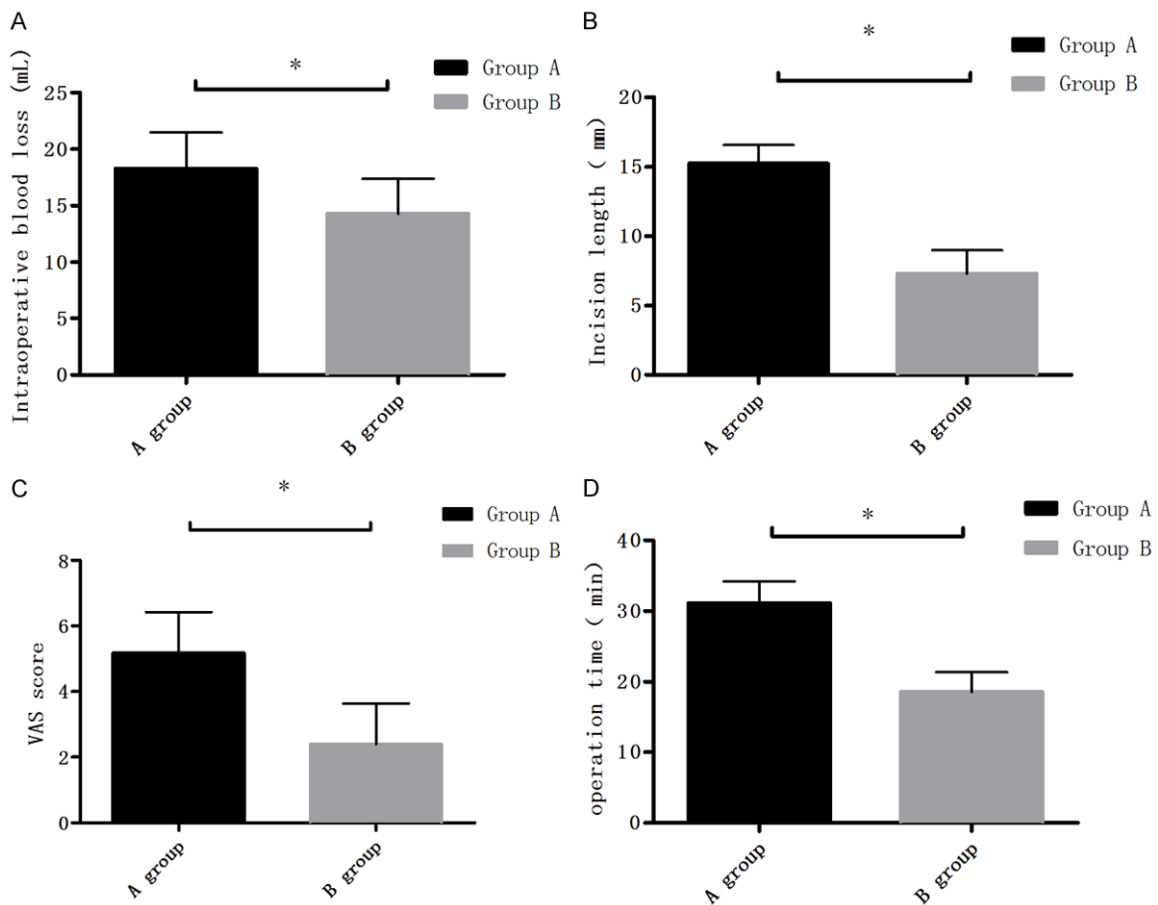


Figure 2. Comparison of operative situation between the two groups. A. Comparison of intraoperative blood loss between the two groups. B. Comparison of incision length between the two groups. C. Comparison of pain scores between the two groups. D. Comparison of operation time between the two groups. * $P < 0.05$ Group B compare with Group A.

Treatment of patients with breast fibroadenoma

Table 2. Incidence of postoperative complications in the two groups

	GA (n=58)	GB (n=73)	X ²	P
Incision infection	4 (6.90)	1 (1.37)		
Hematoma	5 (8.62)	2 (2.74)		
Subcutaneous ecchymosis	4 (6.90)	1 (1.37)		
Swelling of affected side	3 (5.17)	1 (1.37)		
Total	16 (27.59)	5 (6.85)	10.330	0.001

Table 3. Therapeutic effect in the two groups

	GA (n=58)	GB (n=73)	X ²	P
Cure	32 (55.17)	47 (64.38)		
Markedly effective	18 (31.03)	25 (34.25)		
Ineffective	8 (13.79)	1 (1.37)		
Total effective rate (%)	50 (86.21)	72 (98.63)	7.796	0.005

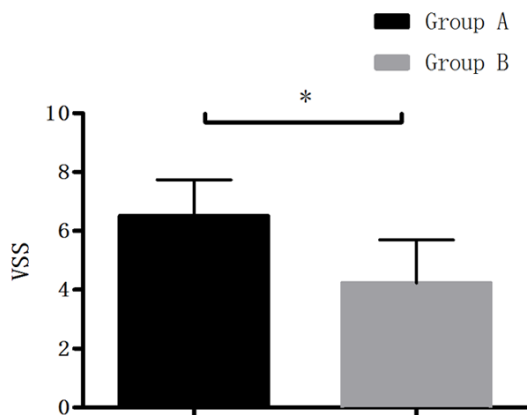


Figure 3. Scar status of patients in the two groups. *P<0.05 Group B compare with Group A.

in GA (P<0.05). The results were statistically different (Table 2).

Therapeutic effect of patients in the two groups

The curative effects were compared in the two groups after treatment. The results showed that the cure rate was 55.17%, markedly effective rate was 31.03%, ineffective rate was 13.79%, and the total effective rate was 86.21% in GA, while the cure rate was 64.38%, markedly effective rate was 34.25%, ineffective rate was 1.37%, and the total effective rate was 98.63% in GB. The total effective rate in GB was significantly higher than that in GA (P=0.005), showing a statistical difference (Table 3).

Scar status of patients in the two groups

According to the VSS, the scarring was assessed in both groups. The results showed that the scar scores of patients in GA were significantly higher than those in GB, and the difference was statistically significant (P<0.05) (Figure 3).

Satisfaction with breast appearance after operation in the two groups

After operation, the satisfaction with breast appearance was evaluated in the two groups. The results showed that the great satisfaction rate of GA was 44.83%, satisfactory rate 37.93%, dissatisfaction rate 17.24% and the overall satisfaction degree was 82.76%; while that of GB was 61.64%, 35.62%, 2.74% and 97.26% respectively. The satisfaction degree in GB was significantly higher than that in GA (P<0.05) (Table 4).

Comparison of quality of life between the two groups

By comparing the postoperative quality of life between the two groups, the results showed that the scores of material, physical, society and psychology in GB were higher than those in GA, with statistical differences (P<0.05) (Figure 4).

Discussion

Breast fibroadenoma is a common benign tumor disease in the breast [16]. Fibroadenoma is composed of epithelium and stroma, which can develop at any age and is usually diagnosed in young women [17]. Some studies have pointed out that women with fibroadenoma are two to three times more likely to develop breast cancer than other women [18]. Therefore, it is very important to treat breast fibroadenoma timely and effectively. With the development of society, people's demand for beauty is getting higher and higher, and the medical field is also paying more attention to people's demand for beauty. Traditional excision has been slowly replaced by new minimally invasive techniques, and there are many treatments for breast fibro-

Treatment of patients with breast fibroadenoma

Table 4. Satisfaction with breast appearance after operation in the two groups

	GA (n=58)	GB (n=73)	χ^2	P
Great satisfaction	26 (44.83)	45 (61.64)		
Satisfactory	22 (37.93)	26 (35.62)		
Dissatisfied	10 (17.24)	2 (2.74)		
Satisfaction	48 (82.76)	71 (97.26)	8.168	0.004

adenoma at present. In this experiment, the trans-areolar resection and minimally invasive mammotome biopsy were analyzed and studied, and the results were as follows: First of all, we compared the age, BMI, living environment, educational background, marital status, fertility level, course of disease, nationality and other factors between the two groups, and found that there was no difference, so the follow-up experiments could be carried out without bias. In the two groups, the changes of blood pressure DBP and SBP indexes were detected before anesthesia, during resection and after operation. The results showed that there was no difference in blood pressure DBP and SBP indexes between the two groups before anesthesia and after surgery, but the blood pressure DBP and SBP indexes in GA was lower than that in GB during resection, suggesting that trans-areolar resection and minimally invasive mammotome biopsy had certain safety, and minimally invasive mammotome biopsy could better stabilize the blood pressure of patients during operation and effectively help them recover after operation.

When the arterial blood vessels elasticity retracts in diastole, the pressure that develops is called diastolic blood pressure (DBP), also known as low pressure [19]. Systolic blood pressure (SBP) is the pressure inside the artery that rises when the heart contracts. In the middle stage of heart contraction, the pressure inside the artery is the highest. At this time, the pressure of blood on the inner wall of the blood vessel is called systolic pressure, also known as high pressure [20]. By consulting the previous data, the studies by Qian Y [21] have proposed that minimally invasive mammotome biopsy has a better stabilizing effect on the blood pressure of patients during operation. The results are similar to the results of this experiment. By comparing the intraoperative blood loss, incision length, pain score, operation time and other operative situations between the two groups, the results showed

that the intraoperative blood loss and incision length in GA were greater than those in GB. The VAS pain score and operation time in GA were higher than those in GB, suggesting that compared with trans-areolar resection, minimally invasive mammotome biopsy was more effective in the treatment of patients. We have speculated that its value is reflected in the following points:

1. Minimally invasive mammotome biopsy is a minimally invasive surgery, and the surgical wound is smaller than that of trans-areolar resection, and it can also relieve patients' pain and facilitate their postoperative recovery [22].
2. According to people's demand for beauty, the wound from minimally invasive mammotome biopsy is smaller than that of trans-areolar resection, and it can effectively reduce intraoperative blood loss, improve surgical safety and reduce postoperative complications.
3. In minimally invasive mammotome biopsy, ultrasound-assisted angiography is used to accurately determine the location of the breast mass of the patient, so the optimal puncture point can be selected. Under the guidance of the ultrasound knife, the rotary knife is used to pierce under the fibroadenoma, and the lesion can be removed more thoroughly by suction via accurate negative pressure [23].

Then, we compared the incidence of postoperative complications between the two groups. The results showed that the incidence of postoperative complications in GA was 27.59%, while that in GB was 6.85%. The incidence of postoperative complications in GB was significantly lower than that in GA, which further confirmed our above conjecture and reflected the safety of minimally invasive mammotome biopsy. By comparing the curative effects of patients in the two groups after treatment, the results showed that the total effective rate of GA was 86.21%, while that of GB was 98.63%. The total effective rate of GB was significantly higher than that of GA, which further reflected the clinical application value of minimally invasive mammotome biopsy. In the research of Chang G [24], it is also shown that minimally invasive mammotome biopsy is more effective than traditional open surgery in the treatment of breast fibroadenoma.

This supports the results of this experiment. According to the VSS, the scarring was assessed in both groups. The results showed that

Treatment of patients with breast fibroadenoma

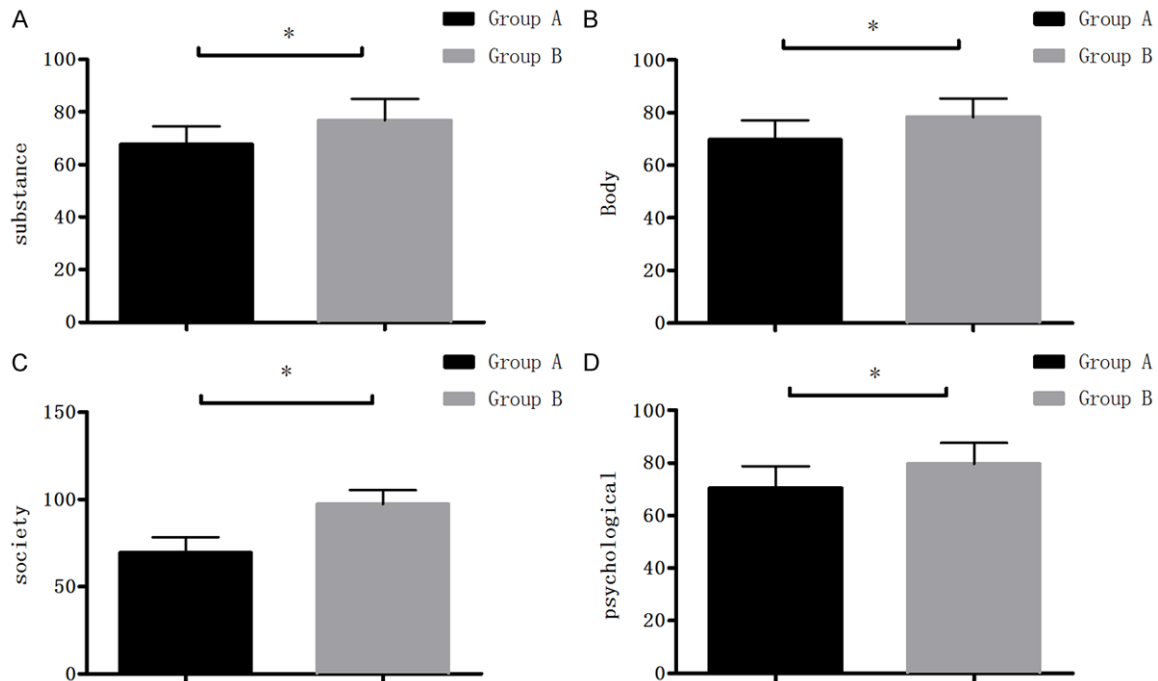


Figure 4. Comparison of quality of life between the two groups. A. Material scores of patients in the two groups. B. Physical scores of patients in the two groups. C. Social scores of patients in the two groups. D. Psychological scores of patients in the two groups. * $P < 0.05$ Group B compare with Group A.

the scarring scores of patients in GA were significantly higher than those in GB. The satisfaction with breast appearance was evaluated after operation in the two groups. The results showed that the satisfaction of GA was 82.76%, that of GB was 97.26%, so the satisfaction of GB was significantly higher than that of GA. This suggests that minimally invasive mammotome biopsy can minimize the adverse effects of breast surgery, increase the satisfaction with the curative and reduce the hospitalization time to a certain extent.

In this study, we investigated the effects of trans-areolar resection and minimally invasive mammotome biopsy in the treatment of breast fibroadenoma, but some deficiencies remain due to the limited experimental conditions. For example the experimental period of this study was relatively short. Therefore, we were unable to assess the impact of the two methods on the long-term prognosis of patients.

Finally, we compared the postoperative quality of life between the two groups. The results showed that the scores of material, physical, society and psychology of patients in GB were higher than those in GA, which further indicated that the minimally invasive mammotome

biopsy could improve the postoperative prognosis of patients, accelerate the recovery and effectively improve their quality of life.

To sum up, compared with trans-areolar resection, minimally invasive mammotome biopsy has a better therapeutic effect on patients with breast fibroadenoma, and it can improve their quality of life more significantly.

Disclosure of conflict of interest

None.

Address correspondence to: Hui Xu, Department of Mammary Health Care, Liaocheng Dongchangfu Maternal and Child Health Hospital, 129 Zhenxing West Road, Dongchang Fu District, Liaocheng 252000, Shandong Province, China. Tel: +86-0635-8460325; E-mail: xiaoyuyingjie@163.com

References

- [1] Ajmal M and Van FK. Breast fibroadenoma. 2018.
- [2] Sampaio FA, Martins LM, Dourado CSME, Revoredo CMS, Costa-Silva DR, Oliveira VA, Alves-Ribeiro FA and Silva BBD. A case-control study of Metallothionein-1 expression in breast cancer and breast fibroadenoma. *Sci Rep* 2019; 9: 7407.

Treatment of patients with breast fibroadenoma

- [3] Namazi A, Adibi A, Haghighi M and Hashemi M. An evaluation of ultrasound features of breast fibroadenoma. *Adv Biomed Res* 2017; 6: 153.
- [4] Martins LM, de Melo Escorcio Dourado CS, Campos-Verdes LM, Sampaio FA, Revoredo CMS, Costa-Silva DR, da Conceição Barros-Oliveira M, de Jesus Nery Junior E, do Rego-Medeiros LM, Gebrim LH, Alves-Ribeiro FA, Rodrigues GP, Chagas DC, do Nascimento Marreiro D and da Silva BB. Expression of matrix metalloproteinase 2 and 9 in breast cancer and breast fibroadenoma: a randomized, double-blind study. *Oncotarget* 2019; 10: 6879-6884.
- [5] Maritz RM and Michelow PM. Cytological criteria to distinguish phyllodes tumour of the breast from fibroadenoma. *Acta Cytol* 2017; 61: 418-424.
- [6] Huang IC, Li PC and Ding DC. Recurrent juvenile fibroadenoma of the breast in an adolescent: a case report. *Medicine (Baltimore)* 2018; 97: e10765.
- [7] Simplicio-Revoredo CM, de Oliveira Pereira R, de Almeida Melo M, Lopes-Costa PV, de Tarso Moura-Borges P, Sousa EB, Neto FM, Campelo V, Soares-Lopes IMR, da Conceição Barros-Oliveira M, Tavares CB, Dos Santos AR, de Araújo CGB, Coelho EG, Campos-Verdes LC, do Nascimento-Holanda AO, Viana JL, Bezerra-Chaves MLM, de Vasconcelos-Valença RJ, Dos Santos LG, Soares-Lopes LR, Pinho-Sobral AL, Gebrim LH and da Silva BB. Expression of Nrf2 and NF- κ B transcription factors in breast cancer and breast fibroadenoma: Insights for a new therapeutic approach. *Oncotarget* 2020; 11: 1629-1636.
- [8] Ter Louw RP, Bruce SB and Nahabedian MY. Partial breast reconstruction with goldilocks technique after excision of giant fibroadenoma: a case report. *Plast Reconstr Surg Glob Open* 2017; 5: e1200.
- [9] Saadallah F, Bouraoui I, Najja L, Sakhri S, Zemni I, Hassouna JB, Dhieb TB, Bouzaiene H and Rahal K. Coexistence of invasive ductal breast carcinoma and fibroadenoma. *Pan Afr Med J* 2019; 33: 139.
- [10] Sun C, Zhang W, Ma H, Han N, Qi M, Li D, Wang X, Wang X and Yang J. Main traits of breast fibroadenoma among adolescent girls. *Cancer Biother Radiopharm* 2020; 35: 271-276.
- [11] Cui H, Liu J, Guo J, Hu S, Xiang A and Ma S. A unique four-point approach for removal of giant breast fibroadenoma with marked asymmetry: a modified round block technique. *J Invest Surg* 2020; 33: 709-714.
- [12] Stoffel E, Becker AS, Wurnig MC, Marcon M, Ghafoor S, Berger N and Boss A. Distinction between phyllodes tumor and fibroadenoma in breast ultrasound using deep learning image analysis. *Eur J Radiol Open* 2018; 5: 165-170.
- [13] Shao X, Ding Y and Wang Z. Curative effect and aesthetics analysis of 40 patients with breast fibroadenoma treated by ring-areola incision. *Chinese Journal of Primary Medicine and Pharmacy* 2018; 25: 433-437.
- [14] Kovatcheva R, Zaletel K, Vlahov J and Stoinov J. Long-term efficacy of ultrasound-guided high-intensity focused ultrasound treatment of breast fibroadenoma. *J Ther Ultrasound* 2017; 5: 1.
- [15] Brenin D, Patrie J, Nguyen J and Rochman C. Treatment of breast fibroadenoma with ultrasound-guided high-intensity focused ultrasound ablation: a feasibility study. *Journal of Breast Imaging* 2019; 1: 316-323.
- [16] Li G, Zhang Y and Ma H. Recurrent vulvar breast fibroadenoma: presentation of a rare clinical condition. *J Int Med Res* 2019; 47: 1401-1405.
- [17] Srinivasan A and Bose JC. Fibroadenoma of ectopic breast tissue - a case report. *Int J Surg Res* 2014; 88-90.
- [18] Javed A, Jenkins SM, Labow B, Boughey JC, Lemaire V, Neal L, Shah SS and Pruthi S. Intermediate and long-term outcomes of fibroadenoma excision in adolescent and young adult patients. *Breast J* 2019; 25: 91-95.
- [19] Flint AC, Conell C, Ren X, Banki NM, Chan SL, Rao VA, Melles RB and Bhatt DL. Effect of systolic and diastolic blood pressure on cardiovascular outcomes. *N Engl J Med* 2019; 381: 243-251.
- [20] Beddhu S, Chertow GM, Cheung AK, Cushman WC, Rahman M, Greene T, Wei G, Campbell RC, Conroy M, Freedman BI, Haley W, Horwitz E, Kitzman D, Lash J, Papademetriou V, Pisoni R, Riessen E, Rosendorff C, Watnick SG, Whittle J and Whelton PK. Influence of baseline diastolic blood pressure on effects of intensive compared with standard blood pressure control. *Circulation* 2018; 137: 134-143.
- [21] Qian Y, Lyu J and Yang Y. Comparison of the effect between mammotome assisted minimally invasive atherectomy and traditional surgery in treatment of youth giant breast fibroadenoma. *Chinese Journal of Endocrine Surgery* 2018; 12: 124-127.
- [22] Wang T and Zhu L. Mamotome-assisted removal with minimal incision of large juvenile fibroadenoma of breast: a case report. *Medicine (Baltimore)* 2020; 99: e19442.
- [23] Buğdaycı O, Kaya H and Arıbal E. Ultrasound guided therapeutic excisional vacuum assisted biopsy in breast fibroadenomas. *J Breast Health* 2017; 13: 74-76.
- [24] Chang G, Yi C and Xiao X. Vacora technique for the resection of multiple benign breast lesions under ultrasonographic guidance. *Chinese Journal of Minimally Invasive Surgery* 2010; 28.