Value of Multimodal Ultrasound in the Diagnosis of Non-Mass Breast Lesions

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Keywords: Multimodal ultrasound, Non-mass breast lesions, Diagnostic value

Abstract: Objective: To explore the clinical value of multimodal ultrasound in the diagnosis of non-mass breast lesions. Methods: The object of this study were 90 patients with non-mass breast lesions who were diagnosed and treated in our hospital from April 2018 to August 2019. They were divided into observation group (multimodal ultrasound diagnosis) and control group (conventional ultrasound diagnosis) according to the table of random digit, with 45 in each group. Results: Compared with the control group, the detection rate (95.56%) and diagnosis rate (93.33%) were higher, misdiagnosis rate (2.22%) and missed diagnosis rate (4.44%) were lower in the observation group ($P < 0.05$). And the satisfaction rate of diagnosis in the observation group (95.56%) was higher than that in the control group (77.78%) ($P < 0.05$). Conclusion: The application of multimodal ultrasound in the diagnosis of non-mass breast lesions can achieve effective diagnosis of patients' diseases, improve the detection rate and diagnosis rate, reduce the misdiagnosis rate and missed diagnosis rate, which is conducive to the early targeted treatment of the patients, and can significantly increase the patients' satisfaction with the diagnosis.

1. Introduction

In recent years, the incidence rate of breast diseases has significantly increased due to various adverse factors. This type of disease is greatly harmful for women's physical and mental health, especially breast cancer, which is difficult to treat and has bad prognosis. Therefore, it is necessary to realize the early diagnosis of breast diseases, and then give patients targeted clinical treatment [1]. At present, breast diseases are mainly diagnosed by imaging technology, including mammography, ultrasound, CT and MRI, but different diagnostic techniques have different diagnostic value. Ultrasound is a commonly used imaging diagnosis technology in clinic. It has significant advantages in diagnosis, including being applicable to all ages, being able to check repeatedly, inexpensive and non-radiation. During the diagnosis and treatment of breast diseases, clinicians pay more and more attention to this diagnosis and treatment method and their degree of acceptance to it is higher and higher. Contrast-enhanced ultrasound plays an important role in the differential diagnosis of focal lesions of abdominal parenchymal organs [2-3]. Therefore, this paper mainly studies the clinical value of multimodal ultrasound in the diagnosis of non-mass breast lesions.

2. Data and Methods

2.1 General Data

The object of this study were 90 patients with breast cancer who were diagnosed and treated in our hospital from April 2018 to August 2019. They were divided into observation group and control group according to the table of random digit, with 45 in each group. The average age of the observation group was (58.64±10.12) years, and that of the control group was (63.17±9.51) years. There was no difference in general data between the two groups ($P > 0.05$), so the two groups can be compared.

2.2 Methods

The patients in the control group were given routine ultrasound examination. The ultrasound probe was used for moderate pressure on the skin surface. Taking the nipple as the center, patients were continuously monitored in counter-clockwise and clockwise ways, and bilateral axillary lymph

  DOI: 10.25236/wccbm.2020.026

nodes were examined to find and localize the nodules. Two-dimensional ultrasound was used to find out the morphological characteristics of the nodule, including its shape, diameter and size, and to record the back and internal echo. Then color Doppler ultrasound was used to carry out color blood flow grading, to fully understand the internal blood flow of the nodule, to measure the blood flow frequency information, and to detect the peak systolic blood flow resistance index and blood flow velocity.

In the observation group, multimodal ultrasound diagnosis was carried out, (1) contrast-enhanced ultrasound: SonoVue was used as the imaging agent and the focus position was placed in the deepest part of breast tissue. 5.0ml of contrast agent was injected into the elbow vein, then 10ml of normal saline was injected. The section was observed under the contrast-enhanced mode, and the perfusion of breast lesions was analyzed for 3 minutes. In addition, the microvasculature, enhancement intensity and defect of contrast agent were judged, and the images were archived, which were diagnosed by two experienced doctors. (2) Ultrasound elastic imaging: In the process of elastic imaging, pressure was applied by hand. In the process of operation, the sampling frame should be 2-3 times larger than the pathological area. The patients were asked to breathe calmly, and the operator carried out tiny and even vibration, so as to obtain the elastic dynamic image.

2.3 Observation Indicators

(1) Compare the detection rate, diagnosis rate, misdiagnosis rate and missed diagnosis rate of the two groups. (2) Compare diagnosis satisfaction.

2.4 Statistical Analysis

This study used SPSS22.0 as statistical software. The measurement and counting data was expressed by "($\bar{x}$ ±s)"and [n(%)]."t"test and "x^2"test were adopted. P < 0.05 means there is statistical significance.

3. Results

Comparison of diagnosis results between the two groups: compared with the control group, the detection rate and diagnosis rate of the observation group were higher, and the misdiagnosis rate and missed diagnosis rate were lower (P < 0.05), as shown in Table 1.

Table 1 Comparative Diagnosis Results [n(%)]

Group	Number of Cases	Detection Rate	Diagnosis Rate	Misdiagnosis Rate	Missed Diagnosis Rate
Observation Group	45	43(95.56)	42(93.33)	1(2.22)	2(4.44)
Control Group	45	31(68.89)	30(66.67)	7(15.56)	8(17.78)
X^2		9.547	13.041	10.851	10.647
P		<0.05	<0.05	<0.05	<0.05

Comparison of diagnosis satisfaction between the two groups: the satisfaction rate of diagnosis in the observation group was higher than that in the control group (P < 0.05), as shown in Table 2.

Table 2 Comparative Diagnosis Satisfaction [n(%)]

Group	Number of Cases	Very Satisfied	Satisfied	Dissatisfied	Total Satisfaction
Observation Group	45	25	18	2	43(95.56)
Control Group	45	16	19	10	35(77.78)
X^2					12.105
P					<0.05

4. Discussion

There are many pathological types of breast non-mass lesions, such as invasive lobular carcinoma, ductal carcinoma in situ, sclerosing adenosis, mastitis and hyperplasia of breast. Under the influence of the continuous development of high-frequency ultrasound technology, the detection rate of non-mass breast cancer lesions is higher and higher. However, the ultrasonic image characteristics have not been fully recognized, so the differential diagnosis and diagnostic accuracy are low [4]. Malignant non-mass breast disease is more a key and difficult content in diagnosis. In the early stage, failure of diagnosing breast diseases in time and lack of targeted treatment will lead to continuous aggravation of the patients' condition and pose a great threat to their life and health [5].

In the process of multimodal ultrasound diagnosis, contrast-enhanced ultrasound can effectively combine the advantages of ultrasound elastic imaging, and can analyze the blood perfusion of the lesion, so as to reflect the histological characteristics of the tumor [6]. Relevant research shows that compared with conventional ultrasound, contrast-enhanced ultrasound can improve the specificity and coincidence rate of diagnosis, prevent misdiagnosis, and reduce the surgical pathology and biopsy. At the same time, contrast-enhanced ultrasound can accurately analyze the changes of perfusion intensity and area, and reflect the curative effect. Compared with X-ray, contrast-enhanced ultrasound can accurately reflect the changes of the structure and size of the lesion, and it can also become a clinical basis in surgical resection [7]. In addition, the relevant research also pointed out that biological prognostic factors and contrast-enhanced ultrasound time --perfusion parameters have a very close relationship, which can predict the therapeutic effect, so as to provide effective guidance for targeted treatment and chemotherapy. In addition, contrast-enhanced ultrasound can also display the vasa vasorum of local tumors in real time. Under the guidance of contrast-enhanced ultrasound, it can more accurately perform the histological puncture of breast masses, and effectively improve the accuracy of biopsy. Through contrast-enhanced ultrasound and elastic ultrasound imaging, the chemotherapy effect of breast cancer can be dynamically observed, so that the effective imaging evidence can be provided [8].

5. Conclusion

This paper explores the clinical value of multimodal ultrasound in the diagnosis of non-mass breast lesions. Compared with the control group, the higher detection rate (95.56%), diagnosis rate (93.33%) and lower misdiagnosis rate (2.22%), missed diagnosis rate (4.44%) of the observation group ($P < 0.05$) indicate that the diagnosis accuracy of multimodal ultrasound is higher. At the same time, the satisfaction rate of the observation group (95.56%)was higher than that of the control group (77.78%) ($P < 0.05$), indicating that patients had a higher acceptance of multimodal ultrasound diagnosis technology. To sum up, the application of multimodal ultrasound in the diagnosis of non-mass breast lesions can effectively improve the detection rate and diagnosis rate, reduce the misdiagnosis rate and missed diagnosis rate, and effectively improve the patients' satisfaction with the diagnosis work, so as to make them more active to cooperate with all works. Therefore, it should be popularized and applied in clinical practice.

References

[1] Huang Baitong(2020). Treatment of elderly lumbar disc herniation with intervertebral foramen stenosis by lateral intervertebral foramen. The Medical Forum,Vol.24,No.1,pp.7-9.

[2] Chen Peifen, Lai Jinyu, Kuang yongpei, et al(2019). The value of contrast-enhanced ultrasound in the biopsy of breast cancer with BI-RADS score of 4 lesions. Journal of Chinese Physician, Vol.21,No.11,pp.1640-1643.

[3] Cheng Hong(2019).Value of ultrasound elastography in the diagnosis of non-mass-like breast lesions[J]. The Journal of Medical Theory and Practice, Vol.32,No.24,pp.4054-4056.

[4] Tan Rong, Zhang Ying, Tang Qi, et al(2019). Ultrasound micropure imaging in differential diagnosis of breast lesions. Chinese Journal of Medical Imaging Technology, Vol.35,No.9,pp. 1336-1340.

[5] Li Dan, Mao Wen, Mou Ying, et al(2019). The value of high frequency Doppler ultrasound in the diagnosis of breast benign lesions and micro cancers. Chinese Journal of Current Advances in

General Surgery, Vol.22,No.9,pp.705-707.

[6] Jiang Weiwei(2019). Clinical application value of color Doppler ultrasound in the diagnosis of breast occupying lesions . Home Medicine,No.11,pp.156.

[7] Hu Liangyong, Li Xi, Xie Fang(2019). The Differential Value of Ultrasound Elastography Combined with BI-RADS in Benign and Malignant Breast Lesions with Small Size (≤2 cm). Imaging Science and Photochemistry, Vol.37,No.6,pp.604-610.

[8] Zhao Lu, Zhang Ying, Cheng Hao, et al(2019). Comparative study of a contrast-enhanced ultrasound predictive model and dynamic contrast-enhanced magnetic resonance imaging in diagnosis of breast lesions. Chinese Journal of Medical Ultrasound (Electronic Edition), Vol.16 ,No.6,pp.419-425.