

Application Comparison of Contrast-Enhanced Ultrasound-Guided Microwave Ablation and Traditional Surgery for Benign Breast Nodules

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Abstract: **Objective:** To analyze the therapeutic effect of contrast-enhanced ultrasound-guided microwave ablation and traditional surgery in the treatment of benign breast nodules. **Methods:** The research subjects included in this study were 68 patients with benign breast nodules admitted to our hospital from January 2020 to January 2021. They were divided into control group and experimental group by random number table method. The control group received traditional surgical treatment (34 cases), and the experimental group received contrast-enhanced ultrasound-guided microwave ablation (34 cases). The treatment effects of the two groups were compared. **Results:** There was no significant difference in operation time between the two groups, which did not meet statistical significance ($P>0.05$). Intraoperative blood loss, incision healing time and pain score were lower in the experimental group than in the experimental group ($P<0.05$). There were significant differences in postoperative hematoma, scar formation rate and lesion residual rate between the two groups, among which the experimental group was lower ($P<0.05$). **Conclusion:** Contrast-enhanced ultrasound-guided microwave ablation and traditional surgery are used in the treatment of benign breast nodules. The former is better than the latter. This treatment method can be promoted.

Keywords: Contrast-Enhanced Ultrasound-Guided Microwave Ablation; Traditional Surgery; Benign Breast Nodules; Surgery-Related Indicators; Postoperative Hematoma, Scar; Residual Lesions

Introduction

Benign breast nodules are a common clinical cystic proliferative disease, which is more common in young and middle-aged women. Most patients have multiple lesions, and only a small number of nodules are cancerous. Up to now, the preferred treatment for this disease is surgical resection. Traditional surgery is a common method for the treatment of this method, and an ideal therapeutic effect can be obtained. And the probability of postoperative infection is high, which makes it difficult for patients to accept. Microwave ablation is a new clinical treatment method, which uses thermal energy to coagulate and necrotic local tissue cells. In order to verify the effect of this surgical treatment. This study analyzed the therapeutic effects of contrast-enhanced ultrasound-guided microwave ablation and traditional surgery in the treatment of benign breast nodules. The results of the study are detailed below.

1. Materials and methods

1.1 Basic information

The subjects included in this study were patients with benign breast nodules admitted to our hospital from January 2020 to January 2021, with a total of 68 cases. They were divided into control group and experimental group by random number table method. The control group received traditional surgical treatment (34 cases), and the experimental group received contrast-enhanced ultrasound-guided microwave ablation (34 cases). The age of the experimental group was 31-49 years old,

and the mean was (37.65±2.34) years old. The age of the control group was 32-48 years old, with an average of (37.54±2.65) years old. The analysis of the basic data of the two groups of patients showed that there was no significant difference in the age of the patients ($P>0.05$).

1.2 Methods

1.2.1 Control group

This group was treated with traditional surgery. Before surgery, color Doppler ultrasound was performed to identify and mark the nodule. After anesthesia, a radioactive incision was made at the marked position.

1.2.2 Experimental group

This group was treated with contrast-enhanced ultrasound guided microwave ablation. The patients underwent preoperative color Doppler ultrasound to clarify the location, size, and number of nodules, and then underwent gray-scale angiography to perform real-time contrast imaging of breast nodules to learn more about the contrast agent in the breast nodules. Perfusion and blood flow distribution. The range of microwave ablation was determined by the maximum diameter of the longitudinal section through the contrast medium perfusion area, and the ablation power was controlled at 30-40 W. Contrast-enhanced ultrasonography was performed 15 minutes after surgery to evaluate the effect of ablation. If there is no contrast agent filling in the breast nodule, and there is no enhancement, it means that the lesion is completely ablated. If there is enhancement in and adjacent to the lesion tissue, it means that the ablation is not complete, and the residual lesion needs to be supplemented and ablated.

1.3 Performance criteria

(1) The relevant indicators (operation time, intraoperative blood loss, incision healing time, postoperative pain score) during the two groups were observed and recorded, and a comparative analysis was carried out. The postoperative pain score was evaluated by the VAS scale, and the lower the score, the lighter the pain.

(2) The postoperative hematoma, scar formation and residual rate of lesions were observed and recorded in the two groups, and were compared and analyzed.

1.4 Statistical methods

The data obtained in the study were processed by SPSS 23.0 software. ($\bar{x} \pm s$) is used to represent measurement data, using t test; (%) is used to represent count data, using (χ^2) test. When the calculated $P<0.05$, it was suggested that there was a significant difference between the compared subjects.

2. Results

2.1 Comparative analysis of surgery-related indicators between the two groups

There was no significant difference in operation time between the two groups, which did not meet statistical significance ($P>0.05$). Intraoperative blood loss, incision healing time and pain score were lower in the experimental group than in the experimental group ($P<0.05$). See Table 1 for details.

Table 1 Comparative analysis of surgery-related indicators between the two groups ($\bar{x} \pm s$)

Groups	Number of cases	Operation time (min)	Intraoperative blood loss (ml)	Incision healing time (d)	Pain score (score)
Control group	34	36.65±12.33	15.43±3.24	12.23±3.54	5.64±1.23
Experimental group	34	37.21±12.35	5.43±1.24	6.54±1.43	2.34±1.65
<i>t</i>	-	0.187	16.807	8.690	9.349
<i>P</i>	-	0.852	0.001	0.001	0.001

2.2 Comparative analysis of postoperative hematoma, scar formation rate and lesion residual rate between two groups

There were significant differences in postoperative hematoma, scar formation rate and lesion residual rate between the two groups, among which the experimental group was lower ($P < 0.05$). See Table 2 for details.

Table 2 Comparative analysis of postoperative hematoma, scar formation rate and residual lesion rate between the two groups [n, (%)]

Groups	Number of cases	Postoperative hematoma	Scarring rate	Lesion survival rate
Control group	34	11 (32.35%)	31 (91.18%)	10 (29.41%)
Experimental group	34	3 (8.82%)	6 (17.65%)	2 (5.88%)
χ^2	-	5.757	37.053	6.476
<i>P</i>	-	0.016	0.001	0.011

3. Discussion

Benign breast nodules can have a great impact on patients' daily life. The incidence of this disease is increasing year by year, and it is gradually developing towards a younger age. Surgical treatment is the first method for the treatment of this disease, but the operation is more traumatic, and the probability of postoperative infection and scarring is high, so it is difficult for young patients to accept.

Contrast-enhanced ultrasound-guided microwave ablation is easy to operate, less invasive, and less likely to cause postoperative scarring. It has been widely used in clinical practice in recent years [2]. This type of surgery is a physical therapy method. High-frequency microwaves promote high-speed rotation of tissue water molecules to generate heat energy. High temperature can necrotize tumor tissue, and at the same time, it can destroy the blood supply of nodules and block the source of nutrition for nodules. This procedure does not require the removal of breast tissue, and the necrotic target tissue can be absorbed by the body. The results of this study showed that there was no significant difference in operation time between the two groups, which did not meet statistical significance ($P > 0.05$). Intraoperative blood loss, incision healing time and pain score were lower in the experimental group than in the experimental group ($P < 0.05$). It is suggested that contrast-enhanced ultrasound-guided microwave ablation can reduce intraoperative blood loss, promote postoperative incision healing, and reduce pain. Traditional surgery requires multiple incisions, and the incisions are large, resulting in multiple scars on the breast after surgery. The results of this study showed that there were significant differences in the postoperative hematoma, scar formation rate and lesion residual rate between the two groups, and the experimental group was lower ($P < 0.05$). It is suggested that contrast-enhanced ultrasound-guided microwave ablation can reduce the generation of postoperative hematoma and scar, and has a good lesion clearance rate, which can meet the aesthetic needs of patients and

has high safety.

To sum up, contrast-enhanced ultrasound-guided microwave ablation and traditional surgery are used in the treatment of benign breast nodules, and the former is better than the latter. This treatment method can be promoted.

References

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