Clinical Application Research on the Use of Prontosan Wound Irrigation Solution in Minimally Invasive Treatment of Breast Abscess Patients

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Abstract. Study on the effect of Prontosan wound irrigation solution in patients undergoing breast abscess minimally invasive surgery. 62 cases of breast abscess patients undergoing Minimally Invasive Surgery were randomly divided into treatment group (33 cases) and control group (29 cases). The treatment group received Prontosan wound irrigation solution flushing and the control group received physiological saline flushing. The wound healing time, postoperative drainage, postoperative hospital stay and times of dressing change were collected for statistical analysis. There were significant differences in the wound healing time, postoperative hospital stay and times of dressing change between treatment group and control group (P<0.05). There was no significant difference in postoperative drainage between study group control group (P>0.05). Prontosan wound irrigation solution is effective in promoting wound healing, shortening postoperative hospital stay and reducing the times of dressing change. There were no side effects observed in the process of using Prontosan wound irrigation solution. It is worth in clinical application.

Introduction

Breast abscess is a common cause of women’s disease [1]. Breast abscess has the characteristics of long duration and easy to relapse and always needs Surgical treatment. How to fully draining while preserving the beauty of the breast and minimizing injury, relieving pain, accelerating healing and reducing recurrence is concerned in clinical work. The common surgical methods in the current clinical application are Ultrasound-guided puncture, minimally invasive, incision and drainage and so on. While each operation method still does not solve the problems above completely. To some extent, minimally invasive-guided puncture solved most of the problem. It can fully discharge pus with the negative pressure suction system, at the same time, peel the necrotic and abnormal breast tissue, retain normal breast tissue as much as possible, reduce the damage to the breast tissue and the milk fistula complications occurred, obtain a satisfactory breast shape. However, a large number of studies have shown that the wound healing time of breast abscess is still long, which increasing the time of hospitalization and the patient’s physical and mental pain. Because of the smaller incision after minimally invasive surgery, many drugs that promote wound healing have been limited. However, As a liquid wound dressing, Prontosan wound irrigation
solution has the effect of Inhibiting the formation of biofilm and promoting the healing of the incision. In recent years, the treatment of Prontosan wound irrigation solution after breast abscess operation by minimally invasive peeling system shows good effects, which greatly shorten the healing time and postoperative hospital stay and reduce the number of dressing change. Here, we will give a summary about it.

Clinical Data

General Information

A total of 62 cases of breast abscess patients were selected from September 2015 to October 2017 in China-Japan Union Hospital of Jilin University. All patients were female with an abscess greater than 5 cm in diameter or an abscess greater than 3cm which is difficult to treat with percutaneous puncture. The patients were divided into two groups, randomly, 33 cases of treatment group, 29 cases of the control group. In the treatment group, the average age18-57(32.24±10.22) years old, average abscess size (5.93±1.34) cm. 20 patients are Lactation breast abscess, 13 patients are Non-lactational breast abscess; In the control group, the average age19-47(30.28±7.87) years old, 21 patients are Lactation breast abscess, 8 patients are Non-lactational breast abscess; After statistical analysis, the age, type of abscess and other aspects of the comparison, the difference was not statistically significant (P>0.05), the two groups were comparable.

Inclusion Criteria

The patient diagnosed with breast abscess by Breast color Doppler ultrasound and confirmed by following pathology examination.

The breast abscess of the patient is greater than 5 cm in diameter or an abscess greater than 3cm which is difficult to treat with percutaneous puncture.

Exclusion Criteria

1. breast abscess caused by tuberculosis and other specific infections.
2. abscess rupture or ultrasound shows the inflammation spread to the epidermis within 5mm below, refractory or recurrent breast abscess.
3. The patients refused Minimally invasive surgery for the treatment of breast abscess.
4. Such basic disorders as severe liver, kidney, heart, cerebrovascular, etc.

Treatment

All the patients were given Minimally invasive of breast abscess. The treatment group required flushing the wound cavity with Prontosan wound irrigation solution for 15min until there is no purulent residue once a day until the wound healing. Before removing the drainage tube, the wound cavity was flushed through drainage tube. After the drainage tube was removed, the wound cavity was washed by syringe through the incision. All operations should be carried out under the condition of aseptic operation. At the same time, the incision was given wound dressing every two or three days. The patients need to dress timely if the dressing exudate after removing the drainage tube. It was observed and recorded wound
healing time, the volume of drainage, times of dressing change, postoperative hospital stay, incision healing level, patients’ satisfaction.

Patients in the control group required flushing the wound cavity with physiological saline. The following treatment was the same as the research group. It was observed and recorded wound healing time, the volume of drainage, times of dressing change, postoperative hospital stay.

**Criteria of Releasing**

Disappearance of symptoms and signs of breast abscess, wound cavity closed by ultrasound, and good healing of incision after removal of drainage tube. No inflammatory manifestations were observed. Blood routine showed white blood cells, the count and ratio of neutrophil were normal.

**Criteria of Wound Healing**

Ultrasound shows the wound cavity was closed.

**Statistical Processing**

Application SPSS21.0 statistical software, measuring data to X±S said, using t test analysis; Count Data used chi-square test, Grade data used Rank sum test. P<0.05 for the difference was statistically significant.

**Results**

**The Comparison of Clinical Curative Effect Index between the Two Groups**

We compare the two groups of patients’ clinical curative effect after symptomatic treatment. In Table 1, the results show that: In treatment group, the average postoperative hospital stay was 8.45±1.64 days. In the control group, the average postoperative hospital stay was 9.52±1.98 days. The average postoperative hospital stay of treatment group was shorter than that of control group, and the difference was statistical significant(P<0.05). In treatment group, the average wound healing time was 7.24±1.56 days. At the control group, the average wound healing time was 8.28±1.39 days. The average wound healing time of treatment group was shorter than that of control group, and the difference is statistical significant(P<0.05). In treatment group, the average postoperative volume of drainage was 99.52±40.59ml. At the control group, the average postoperative volume of drainage was 93.21±32.32ml. The difference was not statistical significant(P>0.05). In treatment group, the average times of dressing change were 3.58±0.83 times. At the control group, the average times of dressing change were 4.00±0.96 times. The average times of dressing change of treatment group was less than that of control group, and the difference was statistical significant(P<0.05).
Table 1. Comparison of Baseline Characteristics between the Two Groups.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Treatment(n=33)</th>
<th>Control(n=29)</th>
<th>$t / z / \chi^2$</th>
<th>$P$</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHS(d)</td>
<td>8.45±1.64</td>
<td>9.52±1.98</td>
<td>-2.172$^z$</td>
<td>0.030</td>
</tr>
<tr>
<td>WHT(d)</td>
<td>7.24±1.56</td>
<td>8.28±1.39</td>
<td>-2.739</td>
<td>0.008</td>
</tr>
<tr>
<td>VOD (ml)</td>
<td>99.52±40.59</td>
<td>93.21±32.32</td>
<td>0.671</td>
<td>0.505</td>
</tr>
<tr>
<td>TDS(T)</td>
<td>3.58±0.83</td>
<td>4.00±0.96</td>
<td>-2.106$^z$</td>
<td>0.035</td>
</tr>
</tbody>
</table>

Notes: PHS, Postoperative hospital stay; WHT, Wound healing time; VOD, Volume of drainage; TDS, times of dressing change; z. Corrected rank sum test.

Discussion

**Introduction of Prontosan Wound Irrigation Solution**

Prontosan wound irrigation solution is a kind of compound which enables topical treatment directly at the site of infection. The main components of the Prontosan wound irrigation solution were 0.1% polyhexanide and 0.1% Undecylenamidopropyl betaine. Polihexanide has a broad spectrum of antimicrobial activity [2-4]. Polihexanide is efficacious and safe for use in wounds [5]. It has been shown to be effective in the reduction of the bacterial load in acute traumatic wounds [6]. Polihexanide is a cationic polymer. It can destroy the microorganism membrane on the tissue surface and sterilize it efficiently by adsorbing the negative phospholipid molecules on the body’s cell membrane and destroying the lipopolysaccharide layer of bacterial cell wall. Consensus on Wound Antisepsis shows that polihexanide and hypochlorite are superior to PVP-iodine for the treatment of contaminated acute and chronic wounds [7].

Undecylenamidopropyl betaine is a kind of surfactant with the effect of lowering the surface tension of a liquid allowing easier spreading; the combination of Polihexanide with Undecylenamidopropyl betaine improves both the activity and biocompatibility of Polihexanide [8]. As a kind of alkaline substance, Undecylenamidopropyl betaine increase the PH, which is good for both improving the effect of Polihexanide on the bacteria and lowering the effect of Polihexanide on the body’s cells [9].

**Prontosan Wound Irrigation Solution Applied to Breast Abscess**

As a kind of moderate antiseptic agents, Prontosan wound irrigation solution is safe and effective for wounds. Prontosan wound irrigation solution has been used for the treatment of diabetic feet and burn wounds. There has not been drug resistance reported until today. As shown in Figure 1, the wound healing time and postoperative hospital stay was shorter, the times of dressing change was less in patients treated with Prontosan wound irrigation solution. There were no side effects observed in the process of using Prontosan wound irrigation solution. Prontosan wound irrigation solution is effective in promoting wound healing, reducing the times of dressing change and shortening postoperative hospital stay. It is worth in clinical application.
References


