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Original Research Article

A Comparative Study of Management of Breast Abscess by Incision and Drainage Vs Ultrasound Guided Needle Aspiration

Vaishnavi Johari[1], Kulwant Singh[2], Kanha Pradhan[3]

[1]Post graduate Trainee Department of General Surgery, People's College of Medical Sciences & Research Centre, Bhopal, Madhya Pradesh, India

[2]Associate Professor Department of General Surgery, People's College of Medical Sciences & Research Centre, Bhopal, Madhya Pradesh, India

[3]Post Graduate Trainee, Department of General Surgery, People's College of Medical Sciences & Research Centre, Bhopal, Madhya Pradesh, India

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Corresponding author: Dr. Vaishnavi Johari

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Abstract

Background-Breast abscess is a common complication of lactational mastitis and is traditionally treated by incision and drainage (I&D). However, ultrasound-guided needle aspiration (USG-NA) has emerged as a minimally invasive alternative with better cosmetic and functional outcomes.

Aim-To compare the outcomes of conventional incision and drainage with ultrasound-guided needle aspiration in the management of lactational breast abscess.

Materials and Methods-This prospective nonrandomized comparative study was conducted in the Department of Surgery over a period of 18 months. A total of 60 patients aged 18–40 years with lactational breast abscess measuring 3–6 cm were included. Patients were divided into two groups: Group A underwent incision and drainage, while Group B underwent ultrasound-guided needle aspiration. Outcomes assessed included continuation of breastfeeding, scar outcome, resolution time, and postoperative pain, duration of hospital stay, recurrence, and postoperative complications. Data were analyzed using SPSS version 25.0, and $p<0.05$ was considered statistically significant.

Results-The mean age in Group A and Group B was 28.41 ± 4.26 years and 26.77 ± 3.82 years, respectively. Continuation of breastfeeding was significantly higher in the USG-NA group (86.67%) compared with the I&D group (63.33%) ($p=0.027$). Minimal scarring was observed in 90% of patients in Group B versus 26.67% in Group A ($p=0.001$). Mean resolution time was significantly shorter in the aspiration group (7.03 ± 2.41 days) than in the I&D group (13.27 ± 3.18 days) ($p<0.0001$). Postoperative pain and hospital stay were also significantly lower in the aspiration group. Recurrence rates were comparable between the groups.

Conclusion-Ultrasound-guided needle aspiration is a safe and effective alternative to incision and drainage for lactational breast abscess, offering faster recovery, reduced pain, shorter hospital stay, improved cosmetic outcomes, and better preservation of breastfeeding.

Keywords: Breast Abscess Incision And Drainage Ultrasound Guided Needle Aspiration.

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Introduction

A breast abscess is a localized collection of pus within the breast tissue, most commonly developing as a complication of untreated or inadequately treated mastitis. It is an important cause of morbidity among lactating women, particularly in developing countries where inadequate puerperal hygiene, delayed treatment, and poor nutrition remain prevalent. [1,2]

Breast abscesses are broadly classified into lactational and non-lactational types, with lactational abscesses being more common. In India, the incidence of abscess formation among women with lactational mastitis ranges from 4.8% to 11%. [3,4] Mastitis itself occurs in nearly 2%–33% of breastfeeding women and may progress to abscess formation in approximately 3%–11% of cases. [5]

The condition is most frequently caused by Staphylococcus aureus infection following milk stasis and bacterial entry through cracked nipples. Lactational abscesses commonly occur during the early breastfeeding period or during weaning due to incomplete drainage of milk. [6] If untreated, breast

abscesses may lead to severe complications including necrotizing infection, sepsis, milk fistula, interruption of breastfeeding, and cosmetic deformity. [7] Traditionally, incision and drainage (I&D) under antibiotic coverage has been considered the standard treatment for breast abscess. Although effective, this method is associated with several disadvantages such as hospitalization, painful dressings, prolonged healing time, scarring, poor cosmetic outcomes, and interruption of breastfeeding. [7,8] With advances in imaging techniques, ultrasound-guided needle aspiration has emerged as a minimally invasive alternative. It offers advantages such as shorter healing duration, reduced pain, better cosmetic results, shorter hospital stay, and earlier resumption of breastfeeding. [9]

However, controversy persists regarding the optimal management approach, especially in multiloculated or recurrent abscesses where aspiration failure rates are higher. [10,11] Therefore, the present study was undertaken to compare incision and drainage with ultrasound-guided needle aspiration in the management of breast abscesses with respect to efficacy, healing time, cosmetic outcome, and recurrence.

Material & Methodology

This prospective nonrandomized comparative study was conducted in the Department of Surgery over a period of 18 months. A total of 60 patients fulfilling the inclusion criteria were enrolled in the study.

Patients aged 18–40 years with a clinical diagnosis of lactational breast abscess measuring 3–6 cm in diameter, confirmed by clinical history, physical examination, and ultrasonography, were included. Only those patients undergoing either incision and drainage or ultrasound-guided needle aspiration and willing to provide written informed consent were enrolled. Patients with non-lactational abscesses, recurrent or chronic abscesses, tubercular abscesses, breast abscess in males, abscesses associated with skin necrosis, and those unwilling to participate were excluded from the study.

Eligible patients were allocated into two groups. Group A underwent conventional incision and drainage (I&D), while Group B underwent ultrasound-guided needle aspiration of the abscess cavity. All patients received empirical antibiotic therapy consisting of intravenous Amoxiclav 1.2 g twice daily and Metronidazole 500 mg three times daily. Aspirated pus samples were sent for culture and sensitivity testing, and antibiotic therapy was subsequently modified according to culture reports.

Post-procedure ultrasonography of the affected breast was performed on the seventh day to assess residual abscess collection. Patients were evaluated for duration of recovery, recurrence, postoperative complications, scar outcome, and ability to resume breastfeeding. Follow-up was continued for four weeks after discharge to assess clinical improvement and cosmetic outcome. Outcomes between the two treatment groups were compared to determine the more effective modality for the management of breast abscess. Data were entered into Microsoft Excel and analyzed using SPSS trial version 25.0. A p-value of less than 0.05 was considered statistically significant.

Result

A total of 60 patients with lactational breast abscess were included, with 30 patients each in the incision and drainage (I&D) group and ultrasound-guided needle aspiration (USG-NA) group. The mean age was comparable between groups (28.41 ± 4.26 vs 26.77 ± 3.82 years; p=0.46). Continuation of breastfeeding was significantly higher in the USG-NA group (86.67%) compared to the I&D group (63.33%) (p=0.027), while milk suppression was required only in the I&D group.

Cosmetic outcomes were superior with USG-NA, where 90% of patients had minimal scarring compared to 26.67% in the I&D group (p=0.001). The mean resolution time was significantly shorter in the aspiration group (7.03 ± 2.41 days) than in the I&D group (13.27 ± 3.18 days) (p<0.0001). Similarly, postoperative pain scores were lower in the aspiration group (VAS: 1.97 ± 1.22 vs 5.07 ± 1.41; p<0.0001).

Hospital stay was also significantly reduced following USG-NA (0.43 ± 0.68 days) compared with I&D (3.63 ± 0.94 days) (p<0.0001). Recurrence rates were comparable between groups (p=0.55). Postoperative complications, including fistula formation and persistent discharge, were more frequent in the I&D group.

Table 1: Baseline characteristics and breastfeeding outcome.

Parameters	Group A (I&D) N=30	Group B (USG-NA) N=30	p- value
Mean Age (Years)	28.41 ± 4.26	26.77 ± 3.82	0.46
Breastfeeding continued	19 (63.33%)	26 (86.67%)	0.027
Breast emptying only	5 (16.67%)	4 (13.33%)	
Milk suspension required	6 (20%)	0 (0%)	

Table 2: Comparison of clinical outcome between the two groups.

Parameters	Group A (I&D) N=30	Group B (USG-NA) N=30	p- value
Minimal Scar	8 (26.67%)	27 (90%)	0.001
Noticeable scar	22 (73.33%)	3 (10%)	
Mean resolution time (days)	13.27 ± 3.18	7.03 ± 2.41	<0.0001
Mean VAS score	5.07 ± 1.41	1.97 ± 1.22	<0.0001
Mean hospital stay	3.63 ± 0.94	0.43 ± 0.68	<0.0001

Table 3: Comparison of recurrence and postoperative complications.

Parameters	Group A (I&D) N=30	Group B (USG-NA) N=30	p- value
Recurrence	1 (33%)	2 (6.67%)	0.55
Fistula formation	3 (10.00%)	0 (0%)	0.07
Persistent discharge	6 (20 %)	2 (6.67%)	0.13
Residual Abscess requiring revision	1 (3.33%)	2 (6.67%)	0.55
No complications	21 (70%)	28 (93.33%)	0.04

Discussion

Breast abscess is a frequent complication of lactational mastitis and requires prompt treatment to relieve symptoms, preserve breastfeeding, and prevent complications. Although incision and drainage (I&D) has traditionally been regarded as the standard treatment, it is associated with postoperative pain, prolonged healing, repeated dressings, scarring, and interruption of breastfeeding. In recent years, ultrasound-guided needle aspiration has emerged as a minimally invasive alternative with encouraging clinical outcomes. [7,8,9]

In the present study, the mean age of patients in the I&D and USG-guided aspiration groups was 28.41 ± 4.26 years and 26.77 ± 3.82 years, respectively, with no statistically significant difference between the groups (p=0.46). Similar age distributions have been reported by Agarwal et al. [12], Dayal and Lal [13], and Totadri et al. [14], suggesting that breast abscess commonly affects women in the reproductive and lactational age group.

Continuation of breastfeeding was significantly better in the aspiration group, where 86.67% of patients continued breastfeeding compared with 63.33% in the I&D group (p=0.027). None of the patients in the aspiration group required milk suppression, whereas 20% of patients in the I&D group required suppression. Similar observations were reported by Agarwal et al. [12] and Chorma et al. [15]. Preservation of breastfeeding is an important advantage of minimally invasive management, as interruption of lactation can negatively affect both maternal and infant health.

Cosmetic outcome was markedly superior in the USG-guided aspiration group. Minimal scarring was observed in 90% of patients undergoing aspiration compared with only 26.67% in the I&D group (p=0.001). These findings are comparable with studies by Agarwal et al. [12] and Chorma et al. [15], both of which demonstrated significantly better cosmetic outcomes following aspiration. The avoidance of surgical incision and repeated dressings likely contributes to improved scar appearance.

Resolution time was significantly shorter in patients managed with USG-guided aspiration. Nearly half of the aspiration group achieved recovery within 1–5 days, whereas most patients in the I&D group required 11–20 days for complete resolution (p<0.0001). Comparable results were reported by Suthar et al. [16] and Chorma et al. [15]. Faster recovery with aspiration may be attributed to reduced tissue trauma and the minimally invasive nature of the procedure.

Postoperative pain was also significantly lower in the aspiration group, with a mean VAS score of 1.97 ± 1.22 compared with 5.07 ± 1.41 in the I&D group (p<0.0001). Similar findings have been documented by Agarwal et al. [12]. Reduced pain improves patient comfort and facilitates earlier return to daily activities and breastfeeding.

Hospital stay was considerably shorter following aspiration, with most patients discharged on the same day or within 24 hours, whereas I&D patients required hospitalization for 3–5 days (p<0.0001). These findings correlate with reports by Agarwal et al. [12], Chorma et al. [15], and Dayal and Lal [13]. Shorter hospitalization also reduces healthcare costs and patient burden.

Recurrence rates were low and comparable between both groups (p=0.55), indicating that USG-guided aspiration is as effective as conventional I&D in achieving abscess resolution. Postoperative complications such as fistula formation and persistent discharge were more common in the I&D group, while the aspiration group demonstrated fewer complications and better overall recovery. Similar findings were observed by Bhat et al. [17]. Overall, the findings of the

present study suggest that ultrasound-guided needle aspiration is a safe, effective, and minimally invasive alternative to incision and drainage for the management of lactational breast abscess, offering superior cosmetic outcomes, reduced pain, shorter recovery time, and better preservation of breastfeeding with comparable recurrence rates

Conclusion

Ultrasound-guided needle aspiration is a safe, effective, and minimally invasive alternative to conventional incision and drainage in the management of lactational breast abscess.

Compared with incision and drainage, it provides significant advantages including shorter resolution time, reduced postoperative pain, minimal scarring, shorter hospital stay, fewer postoperative complications, and better continuation of breastfeeding.

Although recurrence rates were comparable between the two treatment modalities, the overall patient comfort and cosmetic outcomes were superior with ultrasound-guided aspiration. Therefore, ultrasound-guided needle aspiration should be considered the preferred first-line treatment for uncomplicated lactational breast abscesses of moderate size whenever feasible.

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