Bilateral Breast Abscess Caused by *E. coli* in a Non-lactating Woman: A Rare Case

Gürcan Şimşek, Ebubekir Gündeş, Şakir Tekin, Şakir Tavlı
Department of General Surgery, Necmettin Erbakan University, Meram Faculty of Medicine, Konya, Turkey

**ABSTRACT**

Breast abscess usually occurs during lactation and the responsible organism is often *S. aureus*. Breast abscess in non-lactating women is extremely rare and limited data is available in the literature regarding this entity. In our study, a 36-year-old non-lactating female patient who developed bilateral breast abscess due to *E. coli* infection without any predisposing factors has been discussed in light of the literature.

**Key words:** Breast, abscess, *E. coli*, infection

**Introduction**

Breast abscess is usually a disease of the pregnant and lactating women. It occurs rarely outside the lactation period (1). It usually occurs as a complication of trauma or pyogenic mastitis during lactation (2). *S.aureus* is the most commonly isolated organism in breast abscess during lactating period (3).

Breast abscess in non-lactating women is extremely rare and only limited data is available in the literature on this subject (1). The most important risk factor for non-lactating breast abscess is reported as diabetes mellitus (DM) (1, 4). In a study by Rizzo et al. (1) the most frequently isolated pathogen in breast abscesses during lactating period has been reported as *S.Aureus*. There is also a report of a case of bilateral breast abscess due to typhoid fever, in the literature (5).

In this study, bilateral breast abscess due to *E.coli* in a non-lactating patient that was treated successfully by surgical drainage has been discussed in light of the literature.

**Case Report**

A 36-year-old female was admitted to the emergency department complaining of bilateral breast pain, shivers, fever and fatigue. The patient was not lactating at that period, she had three children and had breast-fed all of them and did not have a family history of breast cancer. She was not diabetic and had no history of tobacco use. She had been diagnosed with urinary tract infection about 10 days ago, did not comply with the prescribed medications, however her complaints of frequent urination, and dysuria have ceased.

Breast pain began one week ago and in her right breast. Then she felt pain in her left breast also, and had fever for the last 3 days. The patient appeared septic, her physical examination revealed painful, tender, fluctuating mass lesions on lower quadrants in both breasts (Figure 1, 2). Her temperature was 39.8°C. The laboratory tests were unremarkable except WBC: 18,750, and CRP: 128 mg/dL. The urine analysis was normal. The breast ultrasonography (USG) showed a 48x62 mm subareolar hyper fluid collection in the right breast and a similar lesion of 52x58 mm in size in the left breast. Differential diagnosis included breast abscess, breast tuberculosis, granulomatous mastitis and inflammatory breast cancer. However, considering that both breasts were involved in the process and the septic nature of the patient, she was planned for surgical drainage with a diagnosis of bilateral breast abscess.

She was operated under general anesthesia, and a circumareolar incision was made 1-2 cm away from the areola in the lower quadrant and the abscess cavity was accessed. Approximately 100 ml of purulent material was drained. Samples were collected for culture. Following drainage of the abscess, an incisional biopsy was taken. Similar procedures were performed on the left breast and about 100 ml of abscess was drained (Figure 3). Samples for culture and tissue were taken from the left breast. After irrigation of the abscess cavities, surgical drains were placed and the operation was completed (Figure 4).
The patient was started on parenteral ampicillin-sulbactam treatment. The patient’s general status and fever improved on the first postoperative day, her white blood cell count and CRP values dropped to 11000 and 92 mg/dL, respectively. Both abscess cavities were irrigated daily with saline. *Brucella* and *salmonella* agglutination tests were performed due to bilateral breast abscesses and both were negative. The irrigation fluid was all clear on the second postoperative day. *E.coli* was identified in both breast cultures. The antibiotic treatment was switched to ciprofloxacin, which the bacteria were susceptible to. Metronidazole was also added in combination, to provide coverage against anaerobic organisms. On the third postoperative day, purulent discharge was encountered from the right breast during dressing changes. The upper outer quadrant of the right breast was painful and purulent material was aspirated from this area with a syringe. The abscess in the upper outer quadrant of the right breast was drained under local anesthesia (Figure 5). *E.coli* was identified from the cultures obtained from this site. The patient was discharged on the seventh postoperative day, after removal of her surgical drains.

The patient was discharged and her daily dressing changes were done on an outpatient basis for five more days. The wound was allowed to heal secondarily. The patient’s biopsy results were reported as acute inflammation. The patient’s postoperative 2 weeks, 1 and 6 months breast examination had no evidence of abscess or mastitis. The patient has been followed for 18 months after treatment, with no signs of recurrent abscess.

**Discussion and Conclusions**

Breast abscesses are rarely seen in non-lactating women, and when they do occur in this period they are divided into two groups as subareolar and non-subareolar abscesses. An abscess located under the areola or within 1 cm distance to the areola is defined as subareolar breast abscess, whereas those further than 1 cm from the areola are called non-subareolar breast abscess. Approximately 90% of breast abscesses during non-lactating period are subareolar breast abscesses, with a mean
age of 35-39 years (6). The patient in our study was 36 years old and she was not lactating. Bilateral breast abscess in our patient were diagnosed as subareolar breast abscess. The most important risk factors for the development of breast abscesses in non-lactating women are DM and smoking (1, 4, 6). However, the patient discussed in this presentation did not have any of these factors.

The basic underlying pathology of breast abscess that develops during non-lactational period, is clogging of the lactiferous sinuses with keratin plugs and secondary infection. Thus, persistent infections that can be partially treated with antibiotics and local drainage emerge. This pathology can be treated by total excision of the clogged lactiferous sinuses (6). We believe that our patient should be considered separate from this pathogenesis, due to her having bilateral disease and isolation of E. Coli as a factor. Bilateral breast abscess due to hematogenous dissemination of bacteria such as Salmonella and Brucella have been reported in the literature (5, 7). The recent un-treated urinary tract infection may be the source of E. Coli in this patient. It is well known that the most common cause of community-acquired urinary tract infection is E. coli (8). Nevertheless, since this infection was not confirmed by culture, this idea is nothing more than a hypothesis.

Non-lactational breast abscess occurs either as single or multifocal abscesses. Most of the abscess during this period is in the form of a single abscess and their treatment is antibiotic therapy after surgical drainage. The study by Rizzo et al. (4) reported that ultrasound-guided drainage and antibiotics in the treatment of single abscess provide better cosmetic results as compared to surgical drainage and eliminate the healing period required after surgery. However, surgical drainage is more appropriate than ultrasound-guided drainage in large and multifocal abscesses. We applied surgical drainage rather than ultrasound-guided drainage in our patient. The surgical drainage incision should be made parallel to the areola. In order to achieve the best cosmetic result, we placed the incision 1 cm inferior to the junction of the lower edge of the areola and the skin in our patient. Attention must be paid to keeping the incision shorter than 50% of the circumference of the areola to prevent ischemia of the nipple areola complex. Additionally a biopsy should be performed during the operation to exclude the differential diagnoses such as inflammatory breast cancer, granulomatous mastitis and tuberculosis. We think the exit-site of surgical drains should be placed close to the lower border of the breast. The reason for this is to keep the drain scar in an area that cannot be directly visualized.

The most common cause of breast abscess during the non-lactating period is S. aureus (1). Bilateral breast abscesses due to S. typhi and B. mellitensis have also been reported in the literature (5, 7). We were unable to identify any report of bilateral breast abscess due to E. coli in the literature. In conclusion, the treatment of subareolar breast abscess during the non-lactating period is controversial in the literature. There is no reliable data except for several case-reports regarding breast abscesses during non-lactating period. We believe that treatment of bilateral breast abscesses during non-lactating period is different from the treatment of a single breast abscess. We think the pathogenesis of this type of abscess is different. Surgical drainage should be preferred in the treatment of such patients with culture-antibiogram and implementation of proper antibiotics. In addition, incisional biopsy should be performed during drainage in all cases.

Conflict of Interest: No conflict of interest was declared by the authors.

Peer-review: Externally peer-reviewed.

Informed Consent: Written informed consent was obtained from patients who participated in this case.

Author Contributions: Concept - G.Ş.; Design - Ş.T.; Supervision - Ş.T.; Materials - E.G.; Data Collection and/or Processing - E.B.; Analysis and/or Interpretation - G.Ş.; Literature Review - G.Ş.; Writer - G.Ş.; Critical Review - Ş.T.

Financial Disclosure: The authors declared that this study has received no financial support.

References