

Unilateral breast abscess due to nalidixic acid resistant *salmonella enterica* serovar typhi

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Received - 05 June 2019

Initial Review - 26 June 2019

Accepted - 16 July 2019

ABSTRACT

A breast abscess is a rare complication of Salmonella bacteremia; especially, in immunocompetent patients. In the era of antimicrobial resistance, untreated or resistant Salmonella can lead to abscess formation in various organs of the body. The authors report a case of unilateral breast abscess due to Nalidixic Acid Resistant *Salmonella enterica* serovar Typhi (NARST) in a 30-year-old immunocompetent female. This case report highlights the importance of culture & sensitivity of breast abscesses especially in patients residing in endemic areas or those with a recent history of typhoid fever.

Keywords: Breast abscess, Drug resistance, Salmonella, Typhoid.

The prevalence of enteric fever in developing countries like India is well known. The prevalence of laboratory-confirmed typhoid and paratyphoid among individuals with fever was noted as 9.75% and 0.9% respectively by a previous report [1]. Usually, patients present with complaints of fever, dull frontal headache, and malaise. Other signs like coated tongue, tender abdomen, relative bradycardia, hepatomegaly, and splenomegaly are also common [2].

There have been reports of *Salmonella typhi* dissemination that lead to focal infections forming abscesses in the liver [3], spleen [4] and anterior abdominal wall [5] but typhoid breast abscess is a rare presentation and reported in upto 0.9% of cases [6]. We report a case of unilateral breast abscess due to Nalidixic Acid Resistant *Salmonella typhi* in an immunocompetent female. A successful outcome of the patient relies on surgical drainage followed by the microbiological evaluation that further assists in an appropriate antimicrobial therapy.

CASE REPORT

A 30-year-old female presented to the surgical outpatient department at our hospital with complaints of fever for one month and pain with increasing swelling on the left breast over time for 15 days.

On examination, the patient was febrile with pulse rate 86/min and 16 breaths /min respiratory rate. There were no significant findings on physical and systemic examination. The lump was felt in the left upper quadrant of the left breast

measuring around 5 X 3 cm in size which was tender to touch. No abnormality was noted in the right breast on palpation. Further examination was done to look for axillary lymph node but nodes were not palpable.

Her hemogram done outside hospital showed hemoglobin (Hb): 12 g/dl, total leukocyte count (TLC): 4200/mm³, granulocytes: 59.1%, lymphocytes: 37.4% and monocytes: 3.5%. Serological tests done for malaria, dengue NS1, IgM, IgG and leptospirosis were negative. Mammography showed a laterally located ill-defined hyperechoic lesion in the left breast measuring 4.5 X 3.5 X 2.6 cm and was reported grade II benign lesion as per BIRADS (Breast Imaging Report and Data System) classification for breast imaging.

The patient underwent left breast abscess drainage with lumpectomy. Pus was sent for bacteriological culture. The specimen was processed as per standard protocol. Gram-stained smear showed a fair number of polymorphonuclear cells and occasional gram-negative bacilli. After 24hrs incubation, non-lactose fermenting colonies were observed on Mac Conkey agar and greyish, oxidase negative colonies were observed on Blood agar. Further identification and antimicrobial sensitivity testing were done by the Vitek2 (Biomérieux, Mary l'Etoile, France) system. The isolate was identified as *Salmonella enterica* serovar Typhi sensitive to ceftriaxone, chloramphenicol, trimethoprim/sulphamethoxazole and azithromycin but resistant to nalidixic acid, ciprofloxacin, ofloxacin and ampicillin.

After the diagnosis was made, the patient's history was reviewed and history revealed a rising titer of WIDAL test which was performed

at another healthcare facility 20 days back. The initial WIDAL test showed the titer of somatic antigen (O) 1:320 and flagellar antigen (H) 1:640 which was repeated after 14 days that showed titer O 1:640 and H 1:640. On further enquiry, the patient also gave a history of multiple consultations with general practitioners for fever and had received course of ciprofloxacin for the same. After confirmation of diagnosis at our hospital, the patient was started on oral Cefixime 400mg BD for 5 days to which she responded favorably. The patient came to the hospital every alternate day for wound dressing and within 10days, the lesion showed complete healing.

DISCUSSION

Breast abscesses are generally caused by *Staphylococcus aureus* and mostly during pregnancy and lactation [7]. Typhoid abscess is a rare presentation of Salmonella bacteremia with unknown pathogenesis. The possible causes may be hematogenous spread or lymphatic spread from the gastrointestinal tract or infective bile from carriers. Dissemination of enteric fever pathogens can lead to localized foci of infection anywhere in the body.

In the present case, pure growth of *Salmonella typhi* in bacterial culture along with a history of rising WIDAL titer confirmed the etiology. The patient had no pre-existing or underlying breast disease or predisposing conditions like pregnancy or lactation. There was no history of prior vaccination against typhoid. On examination, the patient was febrile but her general physical and systemic examination was unremarkable. The patient was treated with fluoroquinolones but had not responded to therapy. Vishwanathan R et al [8], Delori M et al [9] and Mahajan RK et al [10] have also reported similar cases of unilateral breast abscess due to *Salmonella typhi*. Singh et al [11] reported a case of bilateral breast abscesses due to *Salmonella Enterica Serotype Typhi*. Even non-typhoidal salmonellae have also been associated with breast abscess. Razeq et al [12] and Edelstein et al [13] had reported cases of breast abscess due to non-typhoidal salmonellae.

Multidrug-resistant (MDR) *Salmonella typhi*, defined as strains resistant to ampicillin, chloramphenicol and cotrimoxazole that increased in frequency from the year 1990s. Fluoroquinolones (FQs) were being used as the drug of choice for the treatment of enteric fever in India since the late 1980s and early 1990s. Over the years, Salmonella causing enteric fever have become resistant to the FQs and are now called as Nalidixic acid-resistant Salmonella (NARS). During 2005-2011, susceptibility percent of fluoroquinolones varied from 87.5% to 7.6% but all isolates 2015 onwards were found resistant to these antibiotics as per the corresponding Clinical and Laboratory Standards Institute (CLSI) guidelines [14].

In the present case, the use of FQs for treating NARST may have been responsible for dissemination and localization of Salmonella in the breast tissue leading to this rare complication. Kumar et al [15] reported multidrug-resistant typhoid with breast abscess. Antimicrobial resistance resulted in a resurgence of disease in many pockets of India. So, if the incidence and transmission of typhoid are not adequately addressed through

public health approaches, uncommon complications of common illness will be the leading cause of morbidity.

CONCLUSION

This case report highlights the need for understanding the local epidemiology of enteric fever and its complications. To ensure appropriate management of rare complications like breast abscesses complete assessment of the patient including breast imaging, microbiological culture, and drug susceptibility report are mandatory to distinguish between infection and malignancy. If not evaluated and treated appropriately, such cases will add on to increase the unnecessary burden of antibiotics on the patients.

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Funding: None; Conflict of Interest: None Stated.

How to cite this article: Patel KP, Poojary RA, Parab SS, Poojary A. Unilateral breast abscess due to nalidixic acid resistant salmonella enteric serovar typhi. Indian J Case Reports. 2019;5(4):346-347.

Doi: 10.32677/IJCR.2019.v05.i04.017