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Case Report

Microbiology Section

Breast Abscess by *Salmonella* Paratyphi A: Case Report and Literature Review

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ABSTRACT

A case of suspicious breast mass due to *Salmonella* enterica serotype Paratyphi A in a non-lactating, diabetic female is being described. The infection was successfully treated with a combination of surgical drainage and antibiotic treatment. This case highlights the fact that a focal *Salmonella* infection involving the breast should be considered as a rare differential diagnosis for breast malignancy and submission of specimens for microbiological analysis may be helpful in establishment of an accurate diagnosis and management.

Keywords: Breast mass, Focal infection

CASE REPORT

A 37-year-old female presented to the Endocrinology Department of a tertiary care hospital in Jaipur in August 2014 with complaints of fever (on and off) and pain in right breast for past 15 days. She had noted a lump in her right breast 4 days back. The patient had type II Diabetes mellitus for past 1 year with poor blood glucose controls and was suffering from hypothyroidism too. She was not on any medication for her ailments at the time of presentation to the hospital. There was no significant surgical and family history. She provided a normal menstrual history, had delivered 2 children with last child birth 8 years back.

On admission, the patient was conscious, oriented to time place and person. Her vitals were as follows BP- 120/80mm Hg, Pulse -86/min, Respiratory rate 18/min and Temperature 101.7°F. Thyroid was not palpable, distal pulses were present and there was no oedema feet. All of her systemic examination was unremarkable. She was evaluated by an endocrine surgeon, who on examination found a lump 4 x 4 cm in right breast on lateral outer quadrant with bilaterally mobile lymph nodes. Locally the skin appeared normal, with no inflammation and was non tender. Provisional diagnosis of breast lump with a suspicion of malignancy was made and following tests were advised : Chest X- ray PA view, bilateral mammogram, USG both breast and axilla, USG whole abdomen, USG guided Fine Needle aspiration Cytology (FNAC) right breast lump and routine blood and biochemistry investigations. Inj. Magnex forte (Cefoperazone/sulbactam) 1.5 gm IV 8 hourly and Inj. Oflox (Ofloxacin) 100 cc IV OD was advised.

All her blood and biochemistry investigations were normal except for Thyroid stimulating hormone (TSH), which was 6.15µIU/ml (normal range: 0.2-4.20µIU/ml) and fasting blood sugar (FBS) -130 mg/dl (normal range: 74-99 mg/dl). Bilateral Mammogram showed negative results. USG whole abdomen showed mild hepatomegaly with fatty infiltration of liver. USG breast and axilla showed well defined heterogeneously hypoechoic mass lesion of approximately 36x18 mm size in the right breast involving 7 o'clock to 9 o'clock position. Multiple dilated tortuous ductal structures were seen in right breast involving the lateral aspect. The dilated ducts measured approximately 7-8 mm in caliber and show thick echogenic material within. The ducts were seen covering towards the nipple. Multiple variable lymph nodes were seen in bilateral axillary region with largest lymph node measuring 17x13 mm and showing evidence of central necrosis. FNAC findings revealed numerous neutrophils against necrotic background suggestive of breast abscess. USG guided drainage of right breast abscess was planned and the drained pus was sent for culture and sensitivity to Microbiology lab. Inj. Amikacin 500 mg IV 12 hourly and Inj. Dalacin (Clindamycin) 600 IV 12 hourly was added to the antibiotic regimen and Inj. Ofloxacin was stopped. In the Microbiology lab, the pus sample was processed on Mac conkey Agar, Sheep blood agar and Thioglycollate broth. On overnight incubation at 35°C, Non lactose fermenting (NLF) colonies were obtained on Mac conkey agar which tested oxidase negative and were identified as *Salmonella* Paratyphi A on Microscan autoScan - 4 (Siemens Healthcare Ltd.). The identity was serologically confirmed by using group specific antiserum (Difco *Salmonella* antiserum factor 2). The isolate was sensitive to Ceftriaxone, Chloramphenicol, Ampicillin, Tetracycline, Cotrimoxazole, Ciprofloxacin, and Ofloxacin and resistant to Nalidixic acid. After the pus culture report was made available Inj. Ceftriaxone 2 gm IV BD was initiated and blood culture and widal test were advised. The results of both these tests were negative. Three days later a repeat USG breast was conducted to assess the reduction in the size of abscess. The repeat USG revealed thick pus in multiple dilated ducts in right breast in lower outer quadrant with reactive lymph nodes. However, no significant decrease in abscess volume was observed. A repeat drainage of abscess was done and aspirated pus sample was again sent for culture and sensitivity. This repeat sample also grew *Salmonella* Paratyphi A. Patient was discharged in stable condition after 7 days of admission on Inj. Ceftriaxone 2 gm IV BD, Inj. Amikacin 250 mg IV BD and Cap Dalacin C 300 mg oral TDS x 4 days with a plan to review after 4 days. The patient showed up for follow-up timely and there was complete resolution of abscess on the second follow-up visit on 10th day post discharge.

DISCUSSION

Salmonella species are a group of gram negative Enterobacteria and known human pathogens. *Salmonella* Typhi and *Salmonella* Paratyphi Are responsible for significant morbidity and mortality in the developing countries. *Salmonella* infection in humans can be classified into five clinical groups: enteric fever, septicemia without localization, focal disease (with or without associated bacteremia), gastroenteritis, and the chronic carrier state [1]. Localized disease can occur following both overt and silent bacteremia followed by seeding of bacteria at distant sites [2]. The pathogenesis of extra-intestinal complications of typhoid fever depends on the ingested inoculum size of the bacterium, the virulence of the strain, the host's immune response, previous exposure and local protective factors [3]. Extremes of ages, immune-suppression, underlying malignancy, intravenous drug abuse and previous trauma have been identified as risk factors for focal *Salmonella* infections [4].

Breast abscess is an extremely rare complication of enteric fever. The earliest description of isolation of *Salmonella enterica* serotype

Typhi from a breast abscess was in 1907 by Thayer and Hazen in a young housemaid presenting to the John Hopkins Hospital, Baltimore [4]. Klose and Sebening (1930) reported an incidence of mastitis as 0.3% in typhoid patients. Prezinski (1937) studied 1196 cases of typhoid over a 2 year period and reported an incidence of 0.5% breast abscess [5]. In a large study conducted at Vellore in India, of the 6250 cases of Salmonellosis, 0.016% cases had focal pyogenic infection with only a single case of breast abscess [6].

On analysis of the available literature on breast abscesses due to *Salmonella* species it was found that most of the patients were immune-competent females between ages 23-45 years of age and non-lactating [7]. However, Mohamed and Asnis have reported a case of *Salmonella enteritidis* breast abscess in a non puerperal geriatric female patient with breast implant in USA [8]. Brncic N et al., have reported a case of *Salmonella enteritidis* breast abscess in a 70 year old man [4]. Neonatal mastitis due to *Salmonella species* has also been described [9]. Mahajan et al., have reported a case of puerperal breast abscess due to *Salmonella* typhi from New Delhi [10].

The literature review reveals that most of the breast abscess cases due to *Salmonella* species have been caused by *Salmonella* typhi. The prevalence of breast abscess due to *S.* typhi infection in the available literature varies from less than 10 to 30 cases [6,11]. There have been published reports for both bilateral breast abscesses [12- 14] as well as unilateral breast abscess due to *Salmonella* typhi both from India and abroad [15-18].

Fernando et al., reported the first case of recurrent breast abscess caused by *Salmonella enterica* serotype Paratyphi A in a 33-year-old Bangladeshi woman residing in Australia [19]. Siddesh and Sumana reported a chronic case of breast abscess by *Salmonella* Paratyphi A for the first time in India from Mysore [20]. A recent report from Pune, Maharashtra has also implicated *Salmonella* Paratyphi A in a case of recurrent breast abscess in a 31-year-old non lactating female [21]. However, unlike all the three reports of *Salmonella* Paratyphi A breast abscess our patient did not have any recurrence or chronicity of abscess.

Among the Non Typhoidal Salmonellae; *Salmonella* Landwasser [22], *Salmonella* serogroup B serotype reading [23] and *Salmonella enterica* serotype Poona [24] have been isolated from breast abscess cases.

A history of intermittent fever for the past 15 days, suggestive of enteric fever was obtained in the indexed patient. No positive blood culture or positive widal test results were obtained in this patient. But the pus from breast aspirated under sonographic guidance grew the same isolate as pure growth on 2 occasions implicating *Salmonella* Paratyphi A as the causative agent of breast abscess in this patient. The histological examination was also suggestive of breast abscess.

It appears that the patient might have had an episode of typhoid fever and the organism got seeded in breast tissue during the bacteraemic phase of the disease. It became activated because of the uncontrolled glycemic status and diabetes of the patient. Increased host susceptibility to infection secondary to lowered resistance due to debilitating diseases is an important determinant of *Salmonella* infection [25]. Salmonella breast abscess have been reported earlier in diabetic patients [12,26,27]. Rizzo M et al., have indicated a strong association between diabetes and breast abscess in non lactating women [28]. Kumar reported a multidrug resistant typhoid with breast abscess [29]. In the present case, the *Salmonella* Paratyphi A isolate showed good susceptibility to almost all the drugs.

CONCLUSION

Through this case report it is intended to highlight the fact that *Salmonella* spp. should be included in the differential diagnosis of breast abscesses in non lactating women coming from endemic areas with or without the history of a recent typhoid fever. It also serves as a reminder that breast abscesses may not always be malignant and laboratory (histopathological / microbiological) analysis is crucial to establish accurate diagnosis.

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