Review Article

Breast abscess due to *Salmonella* species: a brief review of epidemiology, clinical manifestations, serological correlation and management

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**ABSTRACT**

Breast abscess due to *Salmonella* is an uncommon but well recognized extra-intestinal complication of enteric fever. *Salmonella* species is commonly identified as a gastrointestinal pathogen causing bacteremia but inappropriately treated cases can lead to dissemination in multiple organ systems resulting in localized abscess formation. Case reports have been described in literature about extra-intestinal abscesses by both *S. enterica* serotype *typhi* and *paratyphi*. Whilst recently, there has been an upsurge in the frequency of case reports related to *Salmonella* breast abscess, reason may be due to emergence of resistant *Salmonella* strains. Usually uncomplicated abscesses show effective clearance with single course of oral antibiotic agents together with surgery. Reviews have recommended azithromycin as a drug of choice especially in the presence of fluoroquinolones resistance. So, acknowledging prevalence of breast abscess due to salmonella is utmost important.

**Keywords:** Breast, Abscess, *Salmonella*, Clinical features, Serology, Treatment

**INTRODUCTION**

Breast abscess is a localized, painful collection of purulent material in breast tissue mostly affecting women of reproductive age group. They are predominantly lactational but non-lactational abscesses are also seen in premenopausal older women. Although *Staphylococcus aureus* is the most common pathogen, other microorganisms can be found for example *Streptococcus* species, coagulase negative *Staphylococcus* and anaerobes such as *Peptostreptococcus* and *Bacteroides*. Recent studies and various case reports highlighting breast abscess due to *Salmonella spp.* has been noted. In developing countries where enteric fever is endemic, *Salmonella* should be considered one of the main causes of breast abscess and treatment line should be decided accordingly. This review aims to summarize the available various case reports studies related to breast abscess due to *Salmonella spp.*

**EPIDEMIOLOGY OF BREAST ABSCESES**

Although *Staphylococcus aureus* is the commonest pathogen but the incidence of *Salmonella* breast abscesses have been reported in up to 0.9% of cases. *Salmonella* species are majorly responsible for significant morbidity and mortality in developing countries. It is capable of forming localized abscesses in various organs such as subcutaneous tissue, muscles and skin. The pathogenesis of is not well established but possible causes may be hematogenous route and lymphatic spread from gastrointestinal tract. The major risk factors are extremes of ages, immune suppression, underlying malignancy, intravenous drug abuse and previous trauma. On analyzing the literature available on breast abscesses due to *Salmonella spp.*, it was noted that most of the patients were immunocompetent non lactating females between the age group of 23-45 years.
Table 1: Reported cases of breast abscess due to *Salmonella typhi* and *paratyphi*.

<table>
<thead>
<tr>
<th>Ref. no.</th>
<th>Age (years)/sex</th>
<th>Clinical features</th>
<th>Culture</th>
<th>Serology</th>
<th>Treatment</th>
<th>Follow up</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>40/F</td>
<td>c/o fibroadenoma, lump in breast since 2 months.</td>
<td><em>S. typhi</em>, stool culture grew <em>S. typhi</em></td>
<td>TO 1:640, TH 1:320</td>
<td>Ciprofloxacin (IV then switched to oral)</td>
<td>Regression of lesion</td>
</tr>
<tr>
<td>6</td>
<td>42/F</td>
<td>High grade fever with swelling since 15 days.</td>
<td><em>S. typhi</em></td>
<td>TO 1:120, TH 1:120</td>
<td>Oral ciprofloxacin BD for 14 days</td>
<td>Cyst size reduced and excised</td>
</tr>
<tr>
<td>7</td>
<td>35/F</td>
<td>Diabetic, Bilateral painful swelling, low grade fever since 15 days.</td>
<td><em>S. typhi</em></td>
<td>TO 1:160, TH 1:160</td>
<td>Cefotaxime (1 gm, 8 hourly) and later switched over to oral amoxy/clavulanic acid (625 mg tablet, thrice daily)</td>
<td>Responded to therapy</td>
</tr>
<tr>
<td>8</td>
<td>29/F</td>
<td>Bilateral painful lump for 7 days, fever since 1.5 month. Blood culture grew <em>S. typhi</em>, treatment not taken</td>
<td><em>S. typhi</em></td>
<td>TO 1:160 and TH 1:40, AH 1:40.</td>
<td>Oral ciprofloxacin 500 mg bid for 2 weeks</td>
<td>Regression of the lesion. Cultures negative on subsequent visits.</td>
</tr>
<tr>
<td>3</td>
<td>70/M</td>
<td>Diabetic, swelling in breast since 9 months, P/h/o severe gastroenteritis 10 months back, no antibiotics taken.</td>
<td><em>Salmonella enterica</em> serotype <em>enteritidis</em></td>
<td>-</td>
<td>Oral ciprofloxacin</td>
<td>Complete resolution</td>
</tr>
<tr>
<td>9</td>
<td>33/F</td>
<td>Painful lump, recurrent abscess.</td>
<td><em>S. paratyphi A</em></td>
<td>TO &lt;1:40, TH &lt;1:40, AH &lt;1:160, BH &lt; 1:20</td>
<td>IV ceftriaxone prolonged course</td>
<td>Patient responded well</td>
</tr>
<tr>
<td>10</td>
<td>33/F</td>
<td>Painful swelling.</td>
<td><em>S. paratyphi A</em></td>
<td>TO 1:80 and TH = 1:320</td>
<td>Ceftriaxone for 2 weeks</td>
<td>Healing after 3 weeks</td>
</tr>
<tr>
<td>11</td>
<td>40/F</td>
<td>Pain and swelling in breast since 10 days, diarrhoea 10 days before swelling.</td>
<td><em>S. typhi</em></td>
<td>TO 1:80, TH 1:40 AH and BH &lt; 1:20</td>
<td>Oral ciprofloxacin 500 mg bid for 2 weeks along with surgical debridement</td>
<td>Complete healing after 1 month</td>
</tr>
<tr>
<td>12</td>
<td>60/F</td>
<td>Diabetic, fever since 3 days, painful swelling in breast.</td>
<td><em>S. typhi</em></td>
<td>TO 1:80, TH 1:40 AH and BH &lt; 1:20</td>
<td>Cefoperazone-, salbactum 500 mg and Amikacin 1g tice daily for a week</td>
<td>Improved and discharged on oral cefixime 200mg twice daily for 7 days.</td>
</tr>
<tr>
<td>13</td>
<td>37/F</td>
<td>Diabetic, fever and painful lump.</td>
<td><em>S. paratyphi A</em></td>
<td>Widal test negative</td>
<td>IV ceftriaxone</td>
<td>Complete resolution after 10 days</td>
</tr>
<tr>
<td>14</td>
<td>43/F</td>
<td>c/o RA, fever, mild pain and lump in breast</td>
<td><em>S. enterica</em> serotype <em>typhimurium</em></td>
<td>Widal test negative</td>
<td>Oral ciprofloxacin 500 mg BD</td>
<td>Complete healing by 2 weeks.</td>
</tr>
<tr>
<td>15</td>
<td>60/F</td>
<td>Diabetic, painful swelling in breast.</td>
<td><em>S. typhi</em></td>
<td>TO1:40, TH 1:80</td>
<td>-</td>
<td>Wound healed in 10 days</td>
</tr>
<tr>
<td>16</td>
<td>27/F</td>
<td>Unilateral, lump in breast.</td>
<td><em>S. paratyphi A</em></td>
<td>Widal test negative</td>
<td>Oral azithromycin 1gm OD for 5 days, IV ceftriaxone 2 g BD for seven days</td>
<td>Complete resolution in both cases</td>
</tr>
</tbody>
</table>
On Analyzing the incidence of breast abscess in typhoid patients has been observed as 0.3% in 1930 by Klose and Sebening and 0.5% in 1937 by Pezinski in a study of 1,196 cases of typhoid over a period of 2 years. Other authors have also reported similar cases of unilateral breast abscesses due to Salmonella typhi as well as bilateral breast abscesses. Cases were also found from countries like france and USA (Table 1).+19 Unlike Salmonella typhi, breast abscess due to Salmonella paratyphi is a rare complication of enteric fever. Fernando et al had reported the first case of recurrent breast abscess caused by Salmonella enterica serotype paratyphi A while Siddesh et al reported a chronic case of breast abscess by Salmonella Paratyphi A in India from Mysore. Ghadage et al had reported a case of recurrent breast abscess Salmonella paratyphi A in a 31 year old non lactating female.

Among non typhoidal salmonellae, Razeq et al and Edelstein et al had isolated Salmonella landweisser and Salmonella serogroup B respectively. Benwan et al reported a very rare serotype, Salmonella enterica serotype Poona, which was associated with erythema nodosum. Kumar et al reported a multidrug-resistant typhoid with breast abscess. Elumalai et al analyzed the fluoroquinolones resistance mechanism in S. typhi from a breast abscess case, which is rare and uncommon. The S. typhi isolate showed high level resistance to nalidixic acid; minimum inhibitory concentration (MIC) >512 μg/ml and ciprofloxacin (MIC 8 μg/ml).11-18

Hence, any breast abscess in an immunocompetent female with or without a history of enteric fever and no other predisposing factors must be evaluated, keeping the possibility of a Salmonella breast abscess. The pus aspirated must be sent for bacteriological culture. If not done, such diagnosis could be easily missed.

CONCLUSION

This review highlights the need for understanding the local epidemiology of enteric fever and its complications. Complete assessment of the patient including breast imaging, microbiological culture, and drug susceptibility report are essential for appropriate management of rare complications of enteric fever like breast abscesses. Clinicians must be aware of the management and should make referrals for any patient for which resolution does not occur rapidly with a single course of antibiotic therapy. Delay in such issues can have serious consequences on residual morbidity.

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REFERENCES


