

Breast Abscess Due To *Salmonella* Species: A Brief Review

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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 caused by *S. enterica* serotype Typhi and Paratyphi. Whilst recently, there has been an upsurge in the frequency of cases related to *Salmonella* breast abscess, reason may be due to emergence of resistant *Salmonella* strains. So, acknowledging prevalence of breast abscess due to *Salmonella* is of utmost important for complete cure.

Keywords: Abscess, Breast, *Salmonella*

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 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* [1]. 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 options should be decided accordingly. Usually uncomplicated abscesses show effective clearance with single course of oral antibiotic agents together with surgery but reviews have recommended azithromycin as a drug of choice especially in the presence of fluoroquinolones resistance. This review aims to summarize the available various case reports studies related to breast abscess due to *Salmonella* spp.

DISCUSSION

Although *Staphylococcus aureus* is the most common pathogen but the incidence of *Salmonella* breast abscesses have been reported in up to 0.9% of cases [2]. *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 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 [3].

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 [4]. The incidence of breast abscess in typhoid patients was observed to be 0.3% in 1930 by Klose and Sebening and 0.5% in 1937 by Pezinski in a study of 1,196 cases of typhoid. Other authors have also reported similar cases of unilateral breast abscess due to *Salmonella* Typhi as well as bilateral breast abscesses (Table 1). K Jayakumar et al. reported *S. typhi* from unilateral breast abscess in a 40-year old non-lactating woman [5]. Similarly, Viswanathan et al. [6] have reported isolation of *S. Typhi* from a 42-year-old non-lactating female patient with unilateral breast abscess [6]. Singh S et al reported *S. Typhi* from a 35-year-old non-lactating female patient with bilateral breast abscess [7]. Similar bilateral painful lump in a 29 year old female was reported by Singh G et al. that grew *S. Typhi*. Kumar et al. and Murugesan

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et al. reported cases of *S.typhi* in diabetic patient [8-10]. Cases were also reported from countries like France and USA [11,12]. Though *Salmonella* breast abscess is a complication of enteric fever seen exclusively in females, Nada [3] have reported the isolation of *S. enteritidis* from a 70-year-old male patient with unilateral breast abscess.

Table 1. Reported cases of breast abscess due to *Salmonella* Typhi and Paratyphi.

Study	Age/sex	Clinical features	Culture	Serology	Treatment	Follow up
Jayakumar et al. [5]	40 y/F	c/o fibroadenoma, lump in breast since 2 months	<i>S. Typhi</i> , stool culture grew <i>S. Typhi</i>	TO 1:640, TH 1:320	Ciprofloxacin(IV then switched to oral)	Regression of lesion
Viswanathan et al. [6]	42 y/F	High grade fever with swelling since 15 days	<i>S. Typhi</i>	TO 1:120, TH 1:120	Oral Ciprofloxacin BD for 14 days	Cyst size reduced and excised
Singh et al. [7]	35 y/F	Diabetic, bilateral painful swelling, low grade fever since 15 days	<i>S. Typhi</i>	TO1:160, TH 1:160	Cefotaxime (IV then switched to oral Amoxy/clavulanic acid (625 mg tablet, thrice daily)	Responded to therapy
Singh et al. [8]	29 y/F	Bilateral painful lump for 7days, fever since 1.5 month. Blood culture grew <i>S.typhi</i> , treatment not taken	<i>S. Typhi</i>	TO 1:160 and TH 1:40, AH1:40.	Oral ciprofloxacin 500 mg BD for 2 weeks	Regression of the lesion. Cultures negative on subsequent visits.
Brcic et al. [3]	70 y/M	Diabetic, swelling in breast since 9 months, P/H/O severe gastroenteritis 10 months back, no antibiotics taken	<i>Salmonella enterica</i> serotype <i>enteritidis</i>	-	Oral ciprofloxacin	Complete resolution
Fernando et al. [13]	33 y/F	Painful lump, recurrent abscess	<i>S. Paratyphi A</i>	-	IV ceftriaxone, prolonged course	Patient responded well
Siddesh et al. [14]	33 y/F	Painful swelling	<i>S. Paratyphi A</i>	TO <1:40, TH <1:40, AH <1:160, BH <1:40	Ceftriaxone for 2 weeks	Healing after 3 weeks
Banu et al. [22]	40 y/F	Pain and swelling in breast since 10 days, diarrhoea 10 days before swelling	<i>S. Typhi</i>	TO 1:80 and TH 1:320	Oral ciprofloxacin BD for 2 weeks along with surgical debridement	Complete healing after 1 month
Kumar et al. [9]	60 y/F	Diabetic, fever	<i>S. Typhi</i>	TO 1:80 and	Cefoperazone-sulbactam	Improved and

		since 3 days, painful swelling in breast		TH 1:40 and AH and BH <1:20	500 mg and Amikacin 1 g twice daily for a week	discharged on Oral cefixime 200 mg twice daily for 7 days
Sood et al. [23]	37 y/F	Diabetic, fever and painful lump	<i>S. Paratyphi A</i>	Widal test negative	IV ceftriaxone	Complete resolution after 10 days
Baran et al. [24]	43 y/F	c/o rheumatoid arthritis, fever, mild pain and soft lump in breast	<i>S. enterica</i> serotype Typhimurium	Widal test negative	Oral Ciprofloxacin 500 mg BD	Complete healing by 2 weeks
Murugesan et al. [10]	60 y/F	Diabetic, painful swelling in breast	<i>S. Typhi</i>	TO 1:40, TH 1:80	-	Wound healed in 10 days
Agrawal et al. [16]	27 y/F	Unilateral lump in breast	<i>S. Paratyphi A</i>	Widal test negative	Oral azithromycin 1 g OD for 5 days, IV ceftriaxone 2 g BD for seven days	Complete resolution in both cases

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 chronic case of breast abscess by *Salmonella Paratyphi A* from India [13,14]. Ghadage et al. had reported a case of recurrent breast abscess by *Salmonella Paratyphi A* in a 31-year-old non lactating female [15]. Recent cases reported by Agarwal et al. showed complete resolution of unilateral breast abscess with Azithromycin [16]. But further research is required to understand the effective management of breast abscess by azithromycin and other newer agents. Among non typhoidal salmonellae, Razeq et al. and Edelstein et al. had isolated *Salmonella landweisser* and *Salmonella* serogroup B respectively [17,18]. Benwan et al. reported a very rare serotype, *Salmonella enterica* serotype Poona, which was associated with erythema nodosum [19].

Irrational use of antibiotics had raised the incidence of resistant *Salmonella* cases too. Kumar et al. reported a multidrug-resistant typhoid with breast abscess [20]. Elumalai et al. observed fluoroquinolones resistance mechanism in *S. typhi* from a breast abscess case [21]. The study showed high level resistance in *S.typhi* to nalidixic acid (minimum inhibitory concentration [MIC]>512 µg/ml) and ciprofloxacin (MIC 8 µg/ml).

Hence, any breast abscess in an immunocompetent female with or without a history of enteric fever having no other

predisposing factors must be evaluated, keeping the possibility of a *Salmonella* breast abscess. The pus aspirated must be sent for bacteriological culture. Failure to perform microbiological test might lead to missed diagnosis [22-24].

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. Physicians must be aware of the management and should make referrals of patient for which resolution does not occur rapidly with a single course of antibiotic therapy. Delay in diagnosis and appropriate treatment can have serious consequences on residual morbidity.

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