IJPPR
INTERNATIONAL JOURNAL OF PHARMACY & PHARMACEUTICAL RESEARCH
An official Publication of Human Journals
ISSN 2349-7203
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Human Journals
Case Report
April 2021 Vol.:21, Issue:1

Post Transfusion Unilateral Breast Abscess Caused by *Salmonella paratyphi* A.

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ISSN 2349-7203
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Submitted: 22 March 2021
Accepted: 28 March 2021
Published: 30 April 2021

Keywords: Blood transfusion, Breast abscess, and *Salmonella paratyphi A.*

ABSTRACT

A case of breast lump caused by *Salmonella paratyphi A* due to blood transfusion in a non-lactating, perimenopausal female is being described. This case highlights the fact that a focal *Salmonella* infection involving the breast after blood transfusion should be considered as a rare entity and submission of the specimens for microbiological and histopathological analysis proved helpful in the establishment of an accurate diagnosis and timely management.

INTRODUCTION

Salmonella is enteroinvasive gram-negative bacilli that belong to the family *Enterobacteriaceae* and disease caused by this organism can be divided into 2 categories: typhoidal and non-typhoidal. The reservoir for the typhoidal disease is human, and non-typhoidal salmonellae are distributed widely among animals. *Salmonella paratyphi A*; the causative agent of paratyphoid fever can occasionally cause localized abscesses at extra-intestinal sites also. This can occur following both overt and silent bacteremia followed by seeding of bacteria at distant sites [1]. The etiological agents of breast abscess are diverse, *Staphylococcus aureus* being most common. Salmonella species though associated with abscess formation in various organs are rarely associated with breast abscess.

Case history:

A 50-year-old non-lactating, non-diabetic perimenopausal female presented to the surgical outpatient department of our hospital with a complaint of a lump in her left breast and intermittent fever for one month. The swelling appeared and started increasing in size gradually and was associated with fever and pain. There was no history of discharge, lymphadenopathy, and nipple retraction. On local examination, the right breast was normal and a lump of 5×2cm extending from lower inner quadrant to upper inner quadrant of left breast which was free from skin and underlying muscle was palpated. The overlying skin appeared normal, with no signs of inflammation other than mild tenderness. Her general physical and systemic examination was normal. A provisional diagnosis of breast lump with a suspicion of malignancy was made and the following investigations were advised: routine blood investigation, USG of both breasts, and FNAC of the left breast lump. Her routine blood investigations were normal with Hb of 9g/dl. USG of left breast revealed a heterogeneously hypoechoic mass lesion of approximately 5.6x2.5 cm at a 7-11o'clock position abutting the pectoralis muscle. It showed raised vascularity. However, the mammography report stated multiple subcentric lymph nodes measuring 3.2mm SAD in the right axilla raising high suspicion of malignancy, and further histopathological examination was advised. On this basis of the mammography report, a provisional diagnosis of breast lump with a suspicion of malignancy was made. Trucut biopsy of the left breast showed few ill-defined epithelioid cell granulomas and multinucleated giant cells. Background changes revealed dense mixed inflammation comprising of neutrophils, lymphocytes, histocytes, and eosinophils which finally stated granulomatous inflammatory changes that ruled out the

evidence of malignancy. The histological examination reported it as a case of breast abscess. The patient was called back to re-evaluate the history. The patient is a healthy female who had no significant history except for taking antibiotics off and on for the fever. One unit of blood was transfused one month back for anemia after which she experienced pain in her left arm and then she started noticing swelling in her left breast [Figure1]. The patient underwent left breast abscess drainage thereafter. The sample was then processed for microbiological examination and mycobacterial culture. For microbiological examination, the specimen was processed as per standard protocol. Gram-stained smear showed few numbers of polymorphonuclear cells only with no evident bacilli or cocci. After 24hrs of incubation, the culture on blood agar grew grey-white opaque, non-hemolytic colonies, and non-lactose fermenting colonies on MacConkey's agar were observed. This non-lactose fermenting gram-negative bacillus was confirmed as *Salmonella paratyphi* A by conventional biochemical and serotyping methods by using *Salmonella* spp. polyvalent O, O2 and H: a antisera (Murex Biotech, Dartford, UK). The sample was negative for acid-fast bacilli in the direct smear by Ziehl-Neelsen staining and no growth was observed on Lowenstein-Jenson (L-J) medium after three weeks. The antibiotic susceptibility was determined by the Kirby Bauer disk diffusion method following CLSI guidelines and the isolate was found susceptible to ciprofloxacin, trimethoprim-sulfamethoxazole, erythromycin, azithromycin, chloramphenicol, ceftazidime, and ceftriaxone ampicillin, and nalidixic acid. On receipt of the pus culture report blood culture and Widal test were also advised which were negative indicating no systemic involvement. She was initially put on amoxicillin and clavulanic acid orally 500 mg twice daily for 14 days. According to, the susceptibility pattern of the strain, the antibiotic regimen was again rationalized and the patient was started with intravenous ceftriaxone 2 gm 12 hourly for seven days. On follow-up, there was a complete resolution of the abscess.

Figure No. 1: Showed abscess on the left breast

DISCUSSION:

Bacterial contamination of blood components is an infrequent complication of transfusion. The prevalence of the disease by *Salmonella spp* among blood donors is a potential and dangerous source in those subjects who directly received the blood transfusions. *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 [2]. Paratyphoid fever which is caused by *Salmonella paratyphi A* is characterized by acute onset of fever, nausea, abdominal pain, diarrhea, and vomiting. Breast abscess due to *Salmonella paratyphi* is a rare complication of enteric fever. Localized disease can occur after overt and silent bacteremia followed by seeding of bacteria at distant sites [1]. The first case of breast abscess due to *Salmonella* paratyphi A was reported in 2012 by Fernando *et al*. in a young woman from Bangladesh [3]. To the best of our knowledge, there are only five reported cases of breast abscess caused by *Salmonella paratyphi A.*

Table No. 1: Unilateral Breast abscess caused by *Salmonella paratyphi A*

Year	Age/Gender	Any Comorbidity	Unilateral/Bilateral	Clinical Presentation	Reference
2012	33/F	Not Known	Unilateral	Recurrent	Fernando *et al* [3]
2012	33/F	Not Known	Unilateral	Chronic	Siddesh *et al* [4]
2014	31/F	Not Known	Unilateral	Recurrent	Ghadage *et al* [5]
2015	37/F	Not Known	Unilateral	Acute	Sood [6]
2019	35/F	ITP/On steroids	Unilateral	Chronic	Deshpande *et al* [7]

The most likely source could be blood transfusion in our case as hematogenous dissemination of *Salmonella* is a well-established fact and can be the most likely mechanism leading to breast abscess in our case. There are studies which state that the survival rate of *Salmonella* in blood stored in blood bank conditions (4°C-8°C) should be very low since these bacteria grow optimally at 37°C, and usually do not thrive below 8°C but transfused fresh blood may,

however, transmit live *Salmonella* bacteria. Besides, live *Salmonella* organisms at the time of phlebotomy may release pyrogen-inducing endotoxin into the donor unit even after refrigeration has decimated the bacterial population [8]. According to the study conducted by Corales and Schmitt, which states that almost half of the donor population in their study was capable of transmitting *Salmonella* bacteria to the recipients of their blood. The possible explanation, for the high prevalence of *Salmonella* among the blood donors, was that the *Salmonella* is persistent in the human host a feature common to intracellular organisms. Its persistence at sub-clinical levels may be responsible for asymptomatic individuals (carriers) with relatively high antibody titers [9].

On reviewing the literature, there were few cases of recurrent breast abscess caused by *Salmonella paratyphi A* [3-7]. On the follow-up to date, there has been no episode of recurrence in our patient, unlike these cases. There are also reports of multidrug-resistant typhoid with breast abscesses [10]. In our case, the *Salmonella paratyphi A* isolate showed susceptibility to all the drugs. However, blood culture and widal test results were negative in these patients same as in our case.

CONCLUSION:

To conclude we emphasize that screening of the donor's blood is very crucial to detect the presence of Salmonella spp. to prevent post-transfusion bacterial infections as unscreened units of blood may harbor live Salmonella organisms or endotoxin which could cause severe, possibly fatal, post-transfusion reactions.

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