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Breast Abscess in a Man Due to *Salmonella enterica* Serotype Enteritidis

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Nontyphoidal salmonellae can cause breast infection only exceptionally. A case of breast abscess in a 70-year-old man due to *Salmonella enterica* serotype Enteritidis (*Salmonella* Enteritidis) is reported. The infection was successfully treated with a combination of surgical and antibiotic treatment.

CASE REPORT

A 70-year-old man with non-insulin-dependent diabetes mellitus presented to the surgeon with a swelling in his left breast of 9 months in duration. The patient complained of minimal pain as the mass was slowly growing over time. Physical examination revealed a 4- by 4-cm slightly painful left breast mass with livid discoloration of the overlying skin. The breast nipple was retracted. Mammography showed in the left retromammary prepectoral space the presence of two irregular, soft tissue density masses with microcalcifications and calcifications suggesting possible malignancy or, less likely, abscess. Tumor marker CA 15-3 was of normal value, i.e., 8.7 U/ml (reference, 0.1 to 31.3 U/ml). Diagnostic needle aspiration was done, and about 20 ml of pus was obtained; on cytological examination while awaiting culture results, it showed suppurative inflammation. Left subcutaneous mastectomy was performed, and pathohistological analysis revealed chronic inflammation without signs of malignancy. Microbiological examination of the abscess fluid showed a pure growth of *Salmonella enterica* serotype Enteritidis, identified biochemically (API 20E; bioMérieux, Marcy l'Etoile, France) and serologically according to the Kauffmann-White scheme by using commercial (Imunološki Zavod, Zagreb, Croatia) antisera. As examined by disk diffusion test (BBL, BD Diagnostic Systems, Germany), the organism was sensitive to amoxicillin-clavulanic acid, ceftriaxone, trimethoprim-sulfamethoxazole, and ciprofloxacin. The patient was treated with ciprofloxacin orally.

After the diagnosis of breast abscess due to *Salmonella* was made, the patient history was reviewed and revealed an episode of severe acute gastroenterocolitis 10 months earlier. Subsequently obtained medical documentation showed that the patient suffered from severe diarrhea and vomiting lasting 5 days, becoming anuric 2 days before admission to the Infectious Disease Department of one regional hospital. On admission, he was severely dehydrated, with signs of acute renal failure: urea, 40.4 mmol/liter (reference, 2.8 to 8.3 mmol/liter), and creatinine, 824 mmol/liter (reference, 79 to 125 mmol/liter). The patient underwent hemodialysis five times with complete recovery of renal function. *Salmonella* Enteritidis was isolated from stool cultures. The patient did not receive any antibiotic treatment.

Breast abscesses are usually caused by *Staphylococcus aureus* and occur most commonly during pregnancy and lactation, probably as result of nipple trauma and intraductal stasis (4). Associated symptoms usually consist of fever, chills, and variable local

changes. Typhoid breast abscesses have been reported in up to 0.9% of cases of generalized disease due to *Salmonella enterica* serovar Typhi (4, 11). Nontyphoidal salmonellae are described only rarely as the causative organism of breast abscess (1, 2, 4).

Most patients with nontyphoidal *Salmonella* infection have self-limited gastroenteritis, and about 3% to 8% develop secondary bacteremia (10). Localized infections develop in approximately 5% to 10% of persons with nontyphoidal *Salmonella* bacteremia (8). In other patients, especially those who are severely immunosuppressed, primary nontyphoidal *Salmonella* bacteremia occurs without preceding signs of gastroenteritis and is associated with a high incidence of extraintestinal organ involvement (34%) (10). Focal extraintestinal infections from nontyphoidal salmonellae have increased in incidence during the past 2 decades (7). Extraintestinal salmonellosis occurs more often in patients with underlying chronic conditions and immune deficiency (6, 9). Risk factors for focal infections caused by salmonellae, including breast abscesses, are extremes of ages, immunosuppression, underlying malignancy, intravenous drug abuse, and previous trauma (5, 6, 9).

In our case, the patient was male, while in the majority of reported cases of nontyphoidal salmonella breast abscesses, patients were female (1, 2, 4). He was of advanced age, and the only chronic condition from which he was suffering was non-insulin-dependent diabetes mellitus. Our patient had no associated signs of disease such as fever or chills. The swelling of the left breast on physical examination together with the mammography finding was suggestive of malignancy or, less likely, of abscess, and the patient was admitted to the Department of Surgery for surgical treatment. Only after the diagnosis of breast abscess due to *Salmonella* Enteritidis was made was the patient history reviewed, revealing an episode of severe gastroenteritis due to the same bacterium with signs of acute renal failure 10 months earlier, during which he did not receive any antibiotic treatment. The episode of *Salmonella* gastroenteritis was thought to be food borne, because our patient had no known contact with animals. Secondary bacteremia most probably developed as a consequence of gastroenteritis, leading to the breast abscess formation. We may suppose

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that if the patient had been treated with antibiotics when he had *Salmonella* gastroenteritis, the chances for abscess formation following bacteremia would have been lower (8). Although *Salmonella* Enteritidis is the strain most frequently associated with *Salmonella* infections in the European Union and candidate countries (including Croatia) in immunocompetent patients, to our knowledge it has never been described as causing a breast abscess and, furthermore, in a male patient (3). Other serotypes of nontyphoidal salmonellae have been occasionally reported as causative microorganisms of breast abscesses, and a case of parotid abscess due to *Salmonella* Enteritidis has been reported recently (1, 2, 4, 7).

In conclusion, both clinical examination and mammography findings in this case were more suggestive of malignancy than of inflammatory lesion, and laboratory (pathohistological/microbiological) analysis was crucial to establish accurate diagnosis. Therefore, breast abscess should be included in the differential diagnosis of breast malignancy, with submission of specimens for microbiological analysis.

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