



## Primary tuberculous infection of breast: experiences of surgical resection for aged patients and review of literature

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**Abstract:** Primary mammary tuberculosis is a rare entity that usually occurs in female of reproductive age. Herein three such patients including two males with ages over 80 years, who underwent surgical resection, are reported. Fine needle biopsy failed to achieve specific diagnosis before surgical operation. All of their conditions got satisfactory improvement and anti-tuberculosis chemotherapy was administered postoperatively. Previous literature related to the epidemiology, diagnosis and treatment for mammary tuberculosis will be also reviewed. Mammary tuberculosis is usually related to breast feeding women and is extremely rare in aged man. The possible mechanisms resulting in this disease in our three patients, including direct extension, reactivation, or transmitted by staffs or peers of the nursing home, would also be discussed.

**Key words:** Tuberculosis, Breast, Biopsy, Resection

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### INTRODUCTION

Mammary tuberculosis (TB) is such a rare entity, especially in developed country, that this disease sometime enters the differential diagnosis of patients with lesions of the breast (Hamit and Ragsdale, 1982). It can appear with or without tuberculosis lesion on other sites (secondary vs primary) (Shinde *et al.*, 1995) and usually occurs in women of reproductive age, and rarely in males, prepubescent or elderly women (Murkejee *et al.*, 1974). Herein three patients with ages over 80 years, including two males, who underwent surgical resection for uncontrolled breast infection or indeterminate breast lump, are reported.

### CASE REPORTS

#### Case 1

An 89-year-old woman with a 1-month history of right breast mass presented herself. She had no family history of breast carcinoma. This patient had notable hypertension, ischemic heart disease and

atrial fibrillation for many years even with regular medical control. No diabetes mellitus, hepatic or renal diseases were noted. She has lived in day-care nursing home for more than five years. No worker over there was known to have active respiratory tract infection in the recent three months. The woman was afebrile, and on physical examination, there was a huge, firm, painful mass, 6 to 7 cm in diameter, in the subareolar part of her right breast (Fig.1a). There was no nipple discharge or skin retraction. The overlying skin was essentially normal. Several tiny, soft lymph nodes were felt palpated in the ipsilateral axilla. Breast sonography showed a thick-walled cystic mass with heterogeneous and asymmetric density associated with suspected chest wall invasion, but without skin thickening or retraction (Fig.2). Fine needle aspiration cytology was done, but revealed no evidence of malignancy. She underwent empiric antibiotic therapy after breast aspiration but these symptoms/signs did not improve. Thus she was admitted to undergo surgical treatment. Intraoperatively, a purulent, abscess-like lesion was found that the underlying rib cartilages were destroyed. We removed the mass en

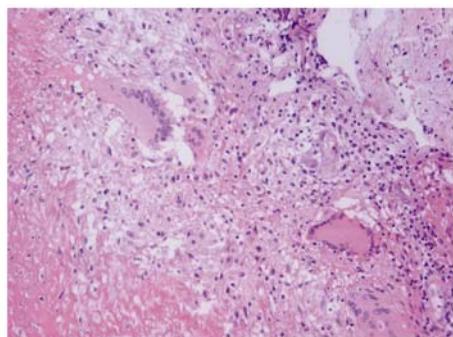
bloc and used curettage on the destroyed rib cartilage. A picture of this mass, measuring 7.0 cm×6.1 cm×3.8 cm in size, revealed pus and cheese-like contents inside it (Fig.1b). The result of pus culture was negative. Microscopic examination (Fig.3) showed multiple caseating granuloma formation, which consisted of epithelioid cells, Langhan's cell and lymphocytes. Areas of abscess formation and necrotic cartilages are also found. There were no signs of malignancy. Although acid fast stain failed to show tuberculous bacilli, this typical picture and the positive result of TB-PCR established the diagnosis of mammary tuberculosis. Retrospective review of her chest roentgenogram and chest computed tomogram after the diagnosis of TB revealed no suspected intrapulmonary or pleural lesions. The patient was started on anti-TB therapy (isoniazid and rifampicin two drugs in combination) and will be treated for 6 months. Her condition is well now.



**Fig.1** (a) A firm and painful mass, measuring 6 to 7 cm in diameter, in the subareolar part of left breast area; (b) Gross picture of this mass, measuring 7.0 cm×6.1 cm×3.8 cm in size, revealing with pus and cheese-like contents inside it



**Fig.2** Breast sonography showing a thick-walled cystic mass with heterogeneous and asymmetric density



**Fig.3** Microscopically, sheets of epithelioid cells are inter-mixed with Langhan's cells, lymphocytes and area of necrosis (H&E stain, 400 $\times$ )

## Case 2

A 92-year-old man presented himself to our outpatient clinic, complaining of a progressively enlarging and painful lump in his right breast for the past 2 months. He has been suffering from the sequelae of minor stroke and progressively senile dementia for over ten years and is now cared full-time in a nursing home. There was no prominent history of evening fever or respiratory symptoms. However, irritable mood with poor control, anorexia and body weight loss were developed in this period. He has no family history of breast carcinoma. There was also no evidence of endemic respiratory tract infection in the nursing home. On physical examination, painful lump, red in color and measuring up to 11 cm in diameter, over the periareolar area of his right breast was noted (Fig.4). This mass was firm, with unclear margin, and with purulent discharge from the nipple. Breast sonography showed a heterogeneous and ill-defined mass with mild posterior acoustic enhancement. The chest X-ray was within normal limits. Culture and cytology from fine needle aspiration were inconclusive and cannot exclude the possibility of malignancy. Empirical antibiotics have been administered for over two months but these symptoms did not get improved. So he was subjected to mass resection for diagnosis and treatment (Fig.5). Mammary tuberculosis was made by typical granulomatous inflammatory lesion and caseous necrosis with positive TB staining. Thorough investigation for TB in other organs was all negative. Anti-TB therapy (two drugs plus vitamin B<sub>6</sub>) was administered post-operatively for 6 months. There has been no recurrence for after 1 year of follow-up.



**Fig.4** A painful lump, red in color and measuring up to 11 cm in diameter, over the periareolar area of his right breast



**Fig.5** A mass containing pus is noted on gross picture

### Case 3

An 80-year-old man came to our clinic, complaining of a painful lump over his left breast. He and his families had no major breast or pulmonary disease before. He lived at home with his daughter but with poor hygiene in the environment. Physical examination revealed a 4-cm mass over the outer-periareolar portion of the left breast, with discharges and inflammatory change of his areolar region. No prominent axillary lymph nodes were noted on palpation. Breast ultrasonography revealed a mass of mixed hyper- and hypoechoic density. Fine needle aspiration cytology revealed some atypical cells that cannot exclude the possibility of malignancy. Since these symptoms were not relieved after three weeks of antibiotic treatment, he was made to undergo lump resection with 2 cm of margin. Pathology revealed granulomatous inflammation with caseous necrosis and peripheral epithelioid and Langhan's cells. He underwent anti-TB treatment (three drugs plus vitamin B<sub>6</sub>) for six months. There has been no recurrence after 18 months of follow-up.

### DISCUSSION

Mammary tuberculosis was first reported by Sir Astley Cooper in 1829 (Murkejee *et al.*, 1974). This is extremely uncommon in western population (less than 0.1%), but account for up to 3% cases of surgically treated breast diseases in tuberculosis endemic areas (Hamit and Ragsdale, 1982; Khanna *et al.*, 2002). The breast tissue, as the spleen or skeletal muscle, is resistant to the growth of the tubercle bacillus (Murkejee *et al.*, 1974), and this has been reflected in the evidence of its extremely low prevalence in patients with pulmonary tuberculosis (Raw, 1924; Murkejee *et al.*, 1971). Tuberculosis of breast might be primary, or more common (more than 60%), spread directly, through hematogenous or lymphatic routes from other sites (McKeown and Wilkinson, 1952).

Mammary tuberculosis most commonly occurs in women in the age group from 20 to 50 years, and who have born children and lactated (Ikard and Perkins, 1977). Up to one-third of such patients were in lactated stage in previous literature (Shinde *et al.*, 1995; Khanna *et al.*, 2002; Banerjee *et al.*, 1987). Elderly women and males with such disease, as cases presented here, have rarely been reported (less than 4% in male or patients older than 60 years of age) previously (Murkejee *et al.*, 1974; Khanna *et al.*, 2002; Bakaris *et al.*, 2006). The proportion of aged patients will be increased by the decrease in new cases of uncontrolled TB infection after the administration of anti-TB chemotherapy. However, there is a trend of increasing either intra- or extra-pulmonary TB after the 1990's following the emergence of multi-drug resistant (MDR) TB and the spread of AIDS (Lilleng *et al.*, 1995).

Mammary tuberculosis might be primary without other tuberculous focus, or secondary to lesions elsewhere in the body (Shinde *et al.*, 1995). Primary infection of the breast may occur through skin abrasions or through the ducts of the nipple. However, mammary tuberculosis is more commonly secondary to the focus elsewhere, by direct, hematogenous or lymphatic spread (Kakkar *et al.*, 2000). None of our cases had previous or active pulmonary TB. The route of transmission is difficult to determine. Two of our cases who complained of nipple discharge might result from the contaminated towels or bedcover of the nursing home. For the case 1, the mammary tu-

erculosis infection might be originated from the adjacent rib cartilage, but the evidence is still not strong enough.

Patients with mammary tuberculosis can have breast lesion with or without discharge sinus. These breast lesions can be classified into the nodular, disseminated, or sclerosing pattern (Goksoy *et al.*, 1995). It is needed to exclude carcinoma or infections of other microorganisms, such as actinomycosis or fungus. Mammary tuberculosis sometimes mimics carcinoma because it is usually ill-defined, irregular, fixative to the skin or chest wall, and sometimes hard. Pain is more present in the tuberculous lesion more than in carcinoma. Nipple or sinus discharge cannot exclude the possibility of malignancy, and the possibility of actinomycosis infection should be considered (Khanna *et al.*, 2002). Mammography and ultrasonography are unreliable in differentiating mammary tuberculosis from carcinoma (Zandriño *et al.*, 2000). Fine-needle aspiration cytology can be diagnostic in about three-fourth of patients with the appearance of epitheloid granulomas or Langhan's giant cells (Kakkar *et al.*, 2000). Other types of biopsy, such as core needle or surgical biopsy, can get higher accuracy in diagnosis. However, all patients in this study were aged, and had wide-spreading lesions, and thus surgical resection for diagnosis and treatment would be reasonable under such situations.

Mammary tuberculosis can be treated by anti-TB chemotherapy. Surgical intervention is reserved for patients with abscess formation, or other infections refractory to medical control (Romero *et al.*, 2000). In our reported cases, surgical resection was indicated because of indeterminate diagnosis after pre-operative diagnostic procedure, or refractory or expected to be not amendable to medical control.

In summary, three cases with ages of over 80 years, including two males, which were extremely rare before, are reported here. None of them had intrapulmonary TB, and the source and route of infection were still unknown. All of them underwent surgical resection because of undetermined diagnosis and resistant to medical control. All of their conditions improved after surgery. Anti-TB chemotherapy is administered for further control. We think that

mammary mastitis in old people might more possibly have occurred in the TB endemic area and patients compromised in immunity or care environment.

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