CASE REPORT

Primary Multidrug-resistant Tuberculosis of the Breast: A Rare Entity

Aditya Aggarwal[1], Jaanakhi Velayutham Muthu[2], Shubhra Jain[3], Vinod Joshi[4]

Received on: 28 March 2023; *Accepted on*: 25 December 2023; *Published on*: 10 July 2024

This article is available on www.vpci.org.in

Abstract

A 41-year-old female patient presented with a painful swelling in right breast for 6 months. Pus was aspirated and subjected to cartridge-based nucleic acid amplification test (CBNAAT) and line probe assay (LPA) which confirmed it as a case of multidrug-resistant tuberculosis. Isolates were resistant to rifampicin (R) and second-line injectables (SLI). The patient improved on bedaquiline (BDQ)-containing regimen.

Keywords: Bedaquiline, Cartridge-based nucleic acid amplification test, Case report, Line probe assay, Second-line injectables.

The Indian Journal of Chest Diseases and Allied Sciences (2024): 10.5005/jp-journals-11007-0110

Abbreviations used in this Article

AFB = Acid-fast bacilli; BDQ = Bedaquiline; CBNAAT = Cartridge-based nucleic acid amplification test; DLM = Delamanid; ESR = Erythrocyte sedimentation rate; IGRA = Interferon-gamma release assay; LP = Line probe; MDR/RR-TB = Multidrug resistant tuberculosis/Rifampicin resistant tuberculosis; MDR-TB = Multidrug-resistant tuberculosis; PMDT = Management of drug-resistant tuberculosis; SLI = Second-line injectables.

Introduction

Tuberculosis (TB) is the most prevalent infection worldwide. Multidrug-resistant tuberculosis (MDR-TB) has become a rampant problem in many countries, challenging patient survival and is becoming a major hinderance to eliminate the disease. Multi-drug-resistant tuberculosis/Rifampicin-resistant tuberculosis (MDR/RR-TB) cases accounts for 3.3% of new tuberculosis cases and 17% of previously treated cases worldwide. India accounts for 27% of drug-resistant tuberculosis cases worldwide.[1]

Tuberculosis of breast was first reported by Sir Astley Cooper[2] in 1829 who called it "scrofulous swelling of the bosom." Tuberculosis of the breast is very rare with an incidence of 0.64–3.54% of all breast diseases in India.[3] It usually affects young, pregnant, and lactating multiparous women.[4] Only two case reports of microbiologically confirmed primary MDR-TB of the breast had been reported previously.[5,6] Usually, the disease presents with solitary, ill-defined, hard lump which is unilateral and situated in the upper outer quadrant of the breast which mimicks inflammatory disorders or breast carcinoma.

We report a case of primary MDR tuberculosis of breast in a middle-aged female.

Case Description

A 41-year-old female presented at OPD with complaints of painful swelling in lower inner quadrant of right breast for 6 months. The lump started as a small swelling which gradually progressed in size. She had no complaints of fever, chest pain, cough, loss of appetite or weight. She was initially treated with multiple different antimicrobials but with no symptomatic relief.

Physical examination revealed a tender and non-fluctuant lump of size 64 cm located in lower inner quadrant of right breast (Fig. 1). The skin over the lump was inflamed and patient had breast abscess. Left breast was firm and normal. No axillary and cervical lymph nodes were enlarged. Respiratory system examination revealed no abnormality. All routine investigations including complete blood count, liver, renal, thyroid function tests, random blood sugar, HIV, HBsAg, urine microscopy were within normal limits. Erythrocyte sedimentation rate (ESR) was 80 mm at the end of 1st hour. USG breast reported an organized abscess of 8–10 cc (Fig. 2). Chest X-ray (Fig. 3) and USG abdomen were normal. Purulent fluid was aspirated from the swelling which was sterile on pyogenic culture. Acid-fast bacilli (AFB) were not found on smear examination. Pus was also subjected to cartridge-based nucleic acid amplification test (CBNAAT) and LPA. *Mycobacterium* tuberculosis was detected and resistant to rifampicin and second-line injectables (SLI).

As per WHO recommendations, patient was made fully aware of the potential benefits and risks of the novel nature of BDQ and documented informed consent was obtained from the patient and her husband before initiating the treatment. Pretreatment evaluation was done in accordance with the latest programmatic

[1–3]Department of Respiratory Medicine, SMS Medical College, Jaipur, Rajasthan, India

[4]Department of Respiratory Medicine, RUHS College of Medical Science, Jaipur, Rajasthan, India

Corresponding Author: Aditya Aggarwal, Department of Respiratory Medicine, SMS Medical College, Jaipur, Rajasthan, India, Phone: +91 9001514185, e-mail: draditya65@gmail.com

How to cite this article: Aggarwal A, Muthu JV, Jain S, *et al*. Primary Multidrug-resistant Tuberculosis of the Breast: A Rare Entity. Indian J Chest Dis Allied Sci 2024;66(2):57–59.

Source of support: Nil

Conflict of interest: None

Fig. 1: A lump in the lower inner quadrant of the breast

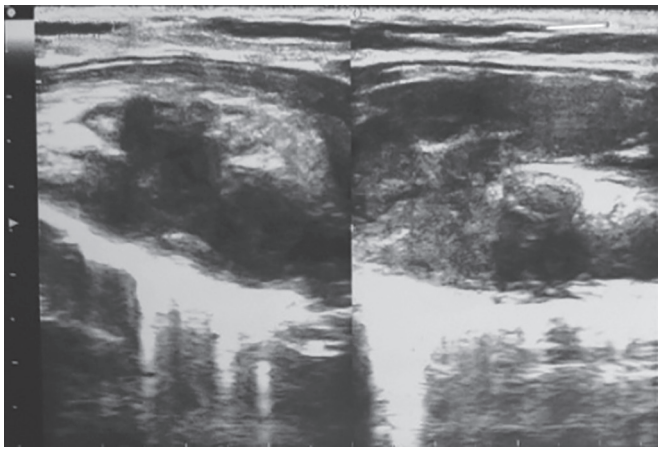

Fig. 2: USG breast depicting organized abscess

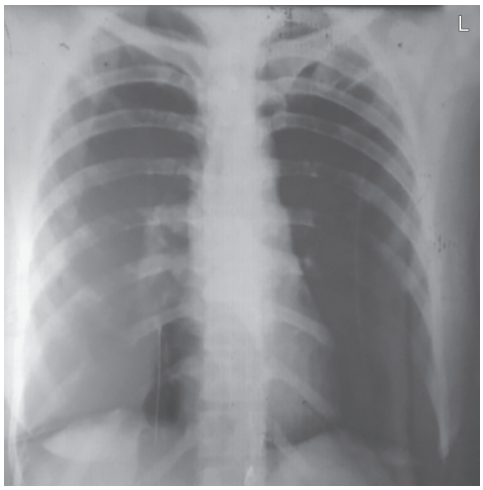

Fig. 3: Normal chest X-ray (PA View)

management of drug-resistant tuberculosis (PMDT) guidelines which came out to be uneventful.

Patient was initiated on MDR drug regimen according to body weight. The regimen includes intensive phase (6 months duration) of bedaquiline (BDQ), levofloxacin, capreomycin,

Fig. 4: Resolved breast lump after 12 weeks of ATT

Ethionamide, Cycloserine, Linezolid, Pyrazinamide and Clofazimine, and Continuation Phase (18 months duration) of Levofloxacin, Ethionamide, Cycloserine and Linezolid.

Treatment was closely monitored with in-patient setup until 2 weeks for effectiveness and safety of the new drug with serial ECG monitoring of the QTc interval. The breast lump showed signs of resolution and healing with decrease in size at the end of 12 weeks (Fig. 4). The patient completed the treatment duration for 24 months.

Discussion

Tuberculosis of the breast is rare as breast does not provide suitable environment for the survival and duplication of tubercle bacilli.[7] The disease usually has multiple presentations such as breast lump alone or breast lump with discharging sinuses or multiple sinuses without lump or symptoms of mastalgia with tender nodules.[8] Besides this, there can be constitutional symptoms like cough, weight loss, evening rise of temperature or anorexia.

Breast TB mostly affects young females as the breast undergoes significant changes during reproductive years which makes it more liable to trauma and infection of the ducts.[9] As per Mckeown and Wilkinson classification,[10] breast TB can be primary or secondary with the latter being more common. Primary tuberculosis of the breast has no evidence of TB lesion elsewhere in the body. It spreads either through abrasion of the skin or through duct opening on the nipple while secondary TB of the breast spreads via retrograde lymphatics (from axillary lymph node or from lung secondaries), continuous seeding from ribs or pleural space and hematological spread as in disseminated TB. In our case, breast TB was primary in nature which is an uncommon entity. Breast tuberculosis can be classified as nodulo-caseous tuberculous mastitis, disseminated/confluent tuberculous mastitis and sclerosing tuberculous mastitis.[8]

Breast TB had been previously reported by few authors in India.[5,8,11–13] In most of the cases, it presented either as a breast lump or breast abscess.[5,11–13] Diagnosis in those cases had been made by histopathological examination. The present case report is unique as it is resistant to both rifampicin and SLI (bacteriologically confirmed) and the patient completed treatment with BDQ-containing regimen. To the best of our knowledge, no such case report has been found on Medline search.

Radiographic imaging (USG) is a good modality for guided procedures (FNAC/Biopsy) to establish histopathological or microbiological diagnosis. Breast tuberculosis is microbiologically confirmed by Ziehl-Neelsen stain-based microscopy for AFB, culture for *Mycobacterium* tuberculosis and molecular diagnostic tests such as NAAT. Tuberculous mastitis is paucibacillary; hence, these tests do not have the same diagnostic utility as in pulmonary TB. Mantoux test and serum interferon-gamma release assay (IGRA) can help in the detection of TB infection in such patients.[14]

Differentials of breast tuberculosis include idiopathic granulomatous mastitis, actinomycosis, sarcoidosis, granulomatous vasculitis, and foreign body giant cell reaction. Peau d'orange appearance is commonly seen in patients with extensive axillary nodal subtype leading to confusion with carcinoma breast. Hence, it poses a great diagnostic challenge on radiological and microbiological investigations, thus a higher index of suspicion is needed.

Programmatic management of drug-resistant tuberculosis 2021 version in India focuses on managing all variants of DR-TB by all oral shorter and longer regimen with newer drugs like BDQ and Delamanid (DLM).[15] However, the guidelines at the time of our diagnosis suggested the use of injectables and patient was subjected to same line of treatment.

Conclusion

Primary multidrug-resistant tuberculosis of the breast should be kept in the differential diagnosis of breast lump especially in endemic countries like India. Pus should be investigated at molecular and histopathological levels and susceptibility pattern of the drug should be ascertained. High index of suspicion, prompt diagnosis, and treatment compliance with appropriate anti-tuberculous drugs can ensure favorable outcome.

Orcid

Aditya Aggarwal https://orcid.org/0000-0002-6026-8039

References

1. WHO Global Tuberculosis Report 2023. Available from: https://www.who.int/tb/publications/global_report/en/.
2. Cooper A. Illustration of the diseases of the breast. In: Longmans, Orme, Brown, Green, editors. Part I. London: 1829. p. 7.
3. Tewari M, Shukla HS. Breast tuberculosis: Diagnosis, clinical features and management. Indian J Med Res 2005;122:103–110. PMID: 16177466.
4. Marinopoulos S, Lourantou D, Gatzionis T, et al. Breast tuberculosis: Diagnosis, management and treatment. Int J Surg Investig Case Reports 2012;31:548–550. DOI: 10.1016/j.ijscr.2012.07.003.
5. Kumar P, Sharma N. Primary MDR-TB of the breast. Indian J Chest Dis Allied Sci 2003;45:63–65. PMID: 12683714.
6. Giri VP. Primary multidrug-resistant tuberculosis of the breast – A rare presentation. Ann Med Health Sci Res 2017;7:70–72.
7. Gupta V, Mohan H, Jain P, et al. Tuberculous mastitis: A report of two cases in elderly females. Jpn J Infect Dis 2006;59:279–280. PMID: 16936356.
8. Gupta A, Bains L, Yadav D, et al. Tubercular mastitis: An institutional experience from a tertiary care centre of Northern India. Asian J Med Sci 2017;8:72–75. DOI: 10.3126/ajms.v8i3.16847.
9. Kant s, Dua E, Goel MM. Bilateral tubercular mastitis. Lung India 2007;24:90–93. DOI: https://doi.org/10.4103/0970-2113.44222.
10. Mckeown KC, Wilkinson KW. Tuberculous diseases of the breast. Br J Surg 1952;39:420. DOI: 10.1002/bjs.18003915705.
11. Sen M, Gorpeligoglu C, Bozer M. Isolated primary breast tuberculosis-Report of three cases and review of literature. Clinics (Sao Paulo) 2009;64:607–610. DOI: 10.1590/s1807-59322009000600019.
12. Hiremath BV, Subramaniam N. Primary breast tuberculosis: Diagnostic and therapeutic dilemmas. Breast Dis 2015;35:187–193. DOI: 10.3233/BD-150407.
13. Prathima S, Kalyani R, Parimala S. Primary tubercular mastitis masquerading as malignancy. J Nat Sci Bio Med 2014;5:184–186. DOI: 10.4103/0976-9668.127324.
14. Gambhir S, Ravina M, Rangan K, et al. Imaging in extrapulmonary tuberculosis. Int J Infect Dis 2017;56:237–247. DOI: 10.1016/j.ijid.2016.11.003.
15. Guidelines for Programmatic Management of Drug Resistant Tuberculosis in India-2021: Ministry of Health and Family Welfare. Tbcindia.gov.in. 2021 [cited 17 June 2022]. Available from: https://tbcindia.gov.in/showfile.php?lid=3590.