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Pulmonary tuberculosis presenting as cystic disease/abscess: A case report

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Abstract---There was a 19% increase in year 2021 when compared to 2020 in TB patients' notification in India, even though TB notifications noted around the period corresponding to India's two major COVID-19 waves showed a brief decline, the National Tuberculosis Elimination Programme (NTEP) managed to reclaim the lost numbers. Cystic changes of the soft tissue and chest wall associated with pulmonary tuberculosis is rarely diagnosed and reported, and only few patients were diagnosed based only on the radiological and histopathological findings. Herewith, we report the microbiological, histopathological, computed tomographic, ultrasound and clinical findings of cystic change in pulmonary tuberculosis in an immunocompetent 18-year-old male who presented with pain in the Chest and swelling in the left infra mammary region for a short duration of one month. The lesion regressed and patient showed clinical improvement following Anti-tuberculous therapy treatment initiation after linking the patient with NIKSHAY system and is currently under ATT.

Keywords---pulmonary TB, microbiology, CBNAAT, histopathology, CT chest, culture.

Introduction

As per the Global TB Report 2021, the estimated incidence of all forms of TB in India for the year 2020 was 188 per 100,000 population (129-257 per 100,000 population). A total of 19,33,381 incident TB patients (new & relapse) were notified during 2021 which was 19% higher than that of 2020 (16,28,161). The programme has been able to catch-up with the dip in TB notifications that was observed around the months when the two major covid waves happened in India through its resilient approach. Cavitation occurs in 50% of the patients with post primary tuberculosis. However, only 1-5% of the PTB patients reported throughout the world had unusual presentations like chest wall abscess, cystic lesions etc. Herewith we report a rare case of pulmonary tuberculosis with cystic changes which developed over a short duration of one month.

Case Report

An 18-year-old male, student, previously noted well, presented to the paediatric OP in April 2022 with complaints of swelling in the lower chest wall below the nipple line with gradual increase in the size and chest pain during inspiration, fever with cough and expectoration which was mucoid and foul smelling for 1 month. The patient did not complain of breathlessness or haemoptysis. There is no known history of contact with a PTB patient. The patient was immunized for his age and also vaccinated with two doses of COVID vaccine. He is immunocompetent with no other comorbidities. On examination, he was examined to be conscious, oriented, not in respiratory distress, temperature 98.6°F, SPO2 99%, Pulse 88 beats/min, respiratory rate 21/min, average build with weight 75Kg with no pallor, cyanosis, icterus, clubbing, oedema and lymphadenopathy. Chest, abdominal and neurological examination were found to be normal.

His laboratory investigations were Hb 14.2%, TLC-7420 with 69% polymorphs and 22% lymphocytes, ESR 26mm. LFT and RFT was examined to be within normal range. CT chest showed an ill-defined mixed density lesion with cystic degeneration and soft tissue component in the left anterior chest wall with underlying erosion of the left anterior 4th rib. A significant lymph node of size 1.5*1.5cm was noted in the left axilla and sub pleural linear atelectatic band seen in the lateral segment of the lower lobe of right lung and posterior segment of the lower lobe of left lung. USG Chest showed well defined heterogenous echoic collection in skin subcutaneous plane in the left chest below the left breast with deeper extension into the underlying muscular plane.

The patient was differentially diagnosed to be a case of TB cold abscess or Ewing's sarcoma, FNAC was inconclusive following which Incision and Drainage procedure was done and the pus was investigated for Bacteriological Culture & Sensitivity, Gram's Stain, AFB staining, nucleic acid testing- CBNAAT by GeneXpert and Histopathological Examination. The pus was negative for AFB staining but AFB was observed with caseating granuloma on HPE examination. Nucleic acid testing by CBNAAT was done thrice on the sample out of which only one test detected Mtb low and rifampicin was sensitive.

The patient was discharged as soon as he felt better after I&D and immediately linked to NTEP and registered with NIKSHAY and started on ATT for DS-TB following confirmation by U-DST and 1st line LPA with FDC 6pills appropriate to his weight band. AFB smear and C&DST results from NTEP are awaited. The patient visits our hospital regularly for routine follow-up and for getting FDC pills and treatment adherence is also ensured through interviews. As of June 2022, he is currently under ATT, completed Intensive Phase, and his clinical condition has improved being afebrile, showing Weight gain of 3Kg, increased appetite, and occasional pricking type of pain during inspiration and with no pain at the I&D site. This shows that he is recovering but under ATT at the during the period of this report submission.

Discussion

PTB is a commonly encountered infectious disease, causing significant morbidity and mortality in endemic nations like India. Disseminated TB can occur after infection or reactivation of latent foci. Early diagnosis and treatment are mandatory and ethical to reduce the morbidity and mortality associated with the illness. Pulmonary TB may present as cystic disease under rare circumstances considered as against the endemicity of it. Hence this explains the importance of the case reported.

Although patient is screened for PTB by routine chest radiography, CT is more accurate when CXR is inconclusive and also provides invaluable information about the extent and distribution of the disease. Unusual CT findings are usually observed in patients with autoimmune deficiency syndrome, the elderly, alcoholics, immunocompromised and diabetics. But, in our case we have reported a young immunocompetent adult with no comorbidities which is a rare occurrence. The disease is often diagnosed late due to symptoms mimicking other pulmonary conditions and slow insidious course with a mean duration of 6.3

months prior to diagnosis. Another reason is also due to its varied clinical presentation and broad spectrum of presentation. In our case, the patient had reported to have developed symptoms over a period of 1 month which is again an unconventional occurrence.

The three mechanisms in the pathophysiology that could lead to the development of chest wall abscess are the first is the direct extension from a pleura or lungs, the second is hematogenous spread of EPTB and the third is by direct extension of tuberculous mediastinal lymphadenitis, which is the former in our case. There are two variants of chest wall TB in soft tissues, one in the form of an abscess and another as a tuberculoma. The muscles in which TB infection has been identified are described in the following order: brachial biceps, right femoral rectum, psoas, rectus abdominis, gluteus maximus, and the sub-masseteric space. The reason for the infection in these structures being rare has been assigned to the high content of lactic acid in the muscles, the absence of lymphatic tissue, a high blood flow, and the high percentage of muscle differentiation. In our case the patient presented with infra mammary abscess, so there is an involvement of pectoralis major.

We have reviewed very few literature sources which reported cystic changes associated with TB all over the world and especially only very few cases have been reported from India. Ko et al reported three immunocompetent women with PTB presenting as acute respiratory failure and CT showed diffuse bilateral pulmonary opacity initially, and multiple cystic lesions on follow up CT; which disappeared almost completely after anti-tuberculous chemotherapy as the same in our case where the patient shows clinical improvement though he is still under ATT. Similar cases were reported by Bushra Johari et al in Malaysia in December 2021, Amish Ray et al in India in 2013, Hriday Ranjan et al in Bangladesh in 2014, Tan et al in Malaysia in 2017, Moran et al in Mexico in 2019, and Bains et al in India in 2019. Most of patients developing lung cysts with tuberculosis have an extensive bilateral infiltrative and an exudative kind of disease as a part of pneumonitic process. The cysts are mostly reversible, but under rare circumstances, the cysts remain static without progression and may persist, luckily the lesion has regressed in our case.

The diagnosis of microbiologically confirmed TB requires that the presence of bacilli to be proved on Smear, HPE and culture. But the positivity of the cultures is found to be 75% considering the paucibacillary nature of the abscess presented. Hence microbiologically confirmed TB may be done with the aid of more precise diagnostic tools like Polymerase Chain Reaction (PCR) amplification and GeneXpert nucleic acid amplification test (NAAT) like in our case.

A sound clinical mind is required for early diagnosis and prompt treatment of PTB that can prevent complications. Cold abscess or collections can be aspirated from the non-dependent areas. Generally, I&D of cold abscess is contraindicated due to the fear of persistent sinus. However, Khan et al. reported that surgical intervention is mandatory if there was: a need for an open biopsy when FNAC is inconclusive as in our case or draining sinuses. Debridement is required to promote early healing for markedly damaged or sequestered bones or joint on

radiographs like in our case where I&D and surgical debridement was done to promote healing of damaged 4th rib.

Conflict of Interest

The authors whose names are listed immediately below certify that they have no financial interest or non-financial interest the subject matter or materials discussed in this manuscript.

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Conclusion

In conclusion, though cystic disease is a relatively rare complication of TB, it is important that we diagnose these kinds of complications especially in young immunocompetent patients and TB should be kept as a differential diagnosis in endemic nations like India. Though clinical TB can be diagnosed with the help of clinical and radiological tools, microbiological confirmation which is the gold standard for diagnosis of TB requires the demonstration of TB bacillus in AFB stain, HPE, U-DST by CBNAAT and Mycobacteriological C&DST. 1st line LPA is also required to decide on the course of ATT after classification as DS-TB or DR-TB. Surgical drainage of the abscess should be considered for markedly damaged and or sequestered bones and joints to promote healing.

Figures

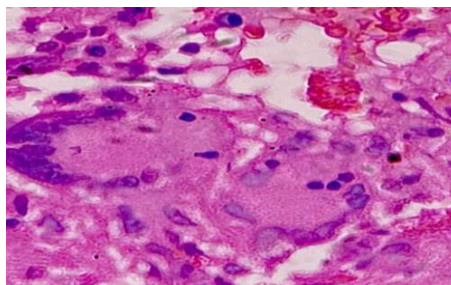


Fig No:1. Caseating granuloma with AFB

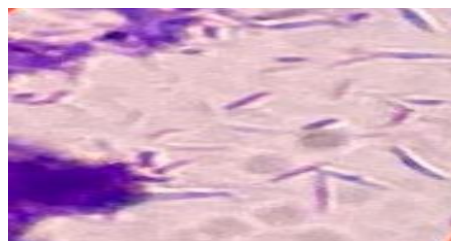


Fig No: 2: AFB in HPE

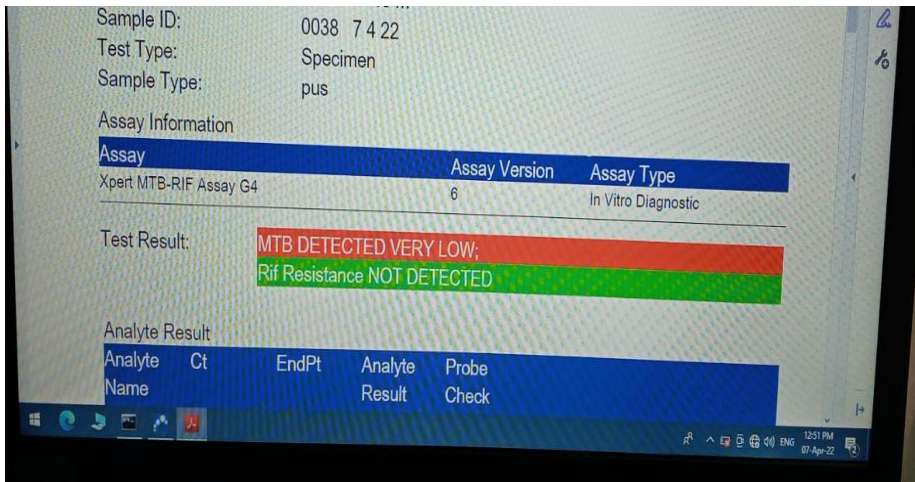


Fig No: 3: CBNAAT report

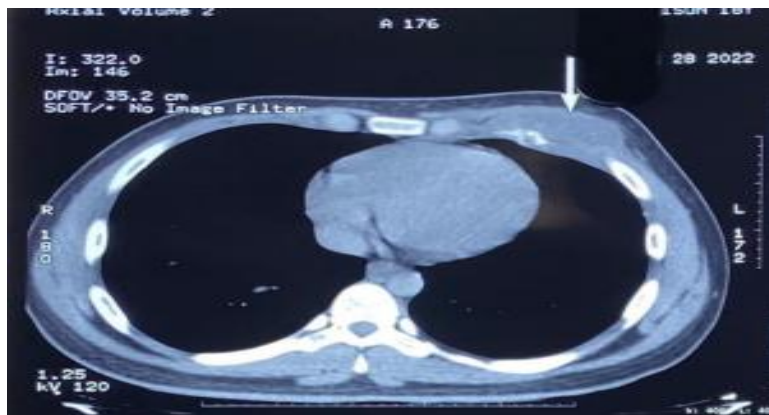


Fig No: 4: CT Chest showing cystic changes and atelectatic bands

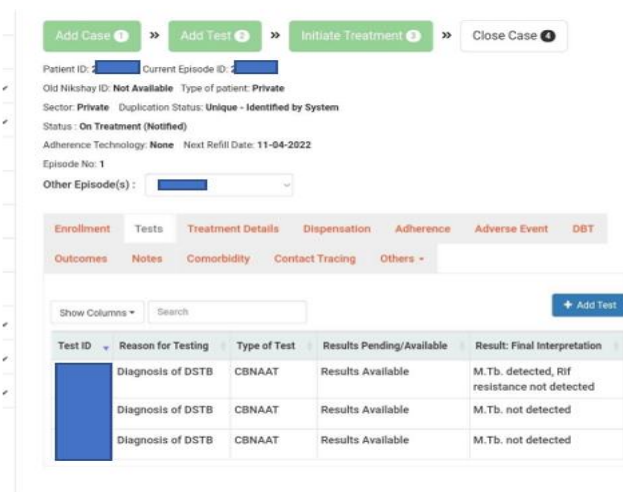


Fig 5: Enrolment in the NIKSHAY system for treatment initiation



Fig 6: Healed incision site as on June 2022

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