CASE REPORT

Drug-resistant pulmonary tuberculosis presenting as mass lesion

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SUMMARY

A 33-year-old woman presented with a 1-month history of dry cough, fever, reduced appetite and weight loss. She had taken antitubercular therapy about a year prior with partial improvement in symptoms. At initial presentation, a plain chest X-ray followed by a contrast-enhanced chest CT scan was advised. The CT scan image was suggestive of a right upper lobe mass lesion. Since the patient had no sputum production, a diagnostic flexible bronchoscopy was performed. The bronchoalveolar lavage fluid analysis along with ultrasonography-guided lung biopsy was diagnostic of multidrug-resistant tuberculosis.

BACKGROUND

Multidrug-resistant tuberculosis (MDR-TB) is defined as *Mycobacterium tuberculosis* resistant to isoniazid and rifampicin with or without resistance to other first-line drugs.¹ For the diagnosis of pulmonary tuberculosis including pulmonary MDR-TB, sputum smear and culture examination are the commonest tests to be performed, followed by drug sensitivity testing (DST) in the latter case. Currently, rapid diagnostic tests such as nucleic acid amplification tests (NAAT) are being frequently used for the diagnosis of MDR-TB. The sensitivity of sputum smear for acid-fast bacilli (AFB) is 50–60% in diagnosing pulmonary tuberculosis.² The characteristic radiological picture of postprimary pulmonary tuberculosis is that of parenchymal opacities located in the apical and posterior segments of upper lobes and superior segment of lower lobe, with or without cavitation.³ In our patient, a sputum specimen was unavailable and the radiological picture was consistent with a mass-like lesion. Diagnostic flexible bronchoscopy and Ultrasonography (USG)-guided transthoracic lung biopsy were performed to arrive at a diagnosis of MDR-TB. This case emphasises the role of flexible bronchoscopy in patients having a pulmonary pathology where the clinical and radiological picture are inconsistent with each other.

CASE PRESENTATION

A 33-year-old woman presented with dry cough, fever and reduced appetite for the past 1 month. She experienced weight loss of around 2.5 kg during this period. She had taken first-line antitubercular treatment (ATT) for 6 months for similar symptoms about a year ago and was symptomatically relieved to some extent, with reappearance of symptoms 7 months after completing the treatment. There was no history of any chronic respiratory

illness in her family members. At presentation, the patient was febrile. The rest of her general physical examination was normal. On respiratory system examination, the trachea was in midline. Percussion note was dull and bronchial breath sound was heard over right infraclavicular and right upper mammary areas.

INVESTIGATIONS

On routine blood investigations, erythrocyte sedimentation rate (ESR) was 80 mm in the first hour (Wintrobe method). The rest of the results were within normal limits. The patient's immune status was normal. Chest radiograph demonstrated a non-homogenous opacity in the right upper zone (figure 1). CT of the chest demonstrated a non-homogeneously enhancing right upper lobe mass lesion (figures 2 and 3). As no sputum samples were available even after sputum induction, a diagnostic fiberoptic bronchoscopy was advised. Bronchoalveolar lavage (BAL) fluid showed few AFB on Ziehl-Neelsen (ZN) staining and the Line Probe Assay (reverse hybridisation) by Genotype MTBDR Plus showed a *Mycobacterium tuberculosis* complex and resistance to rifampicin and isoniazid. USG-guided Tru-cut lung biopsy specimens of the lesion revealed granulomatous inflammation suggestive of pulmonary tuberculosis. ZN staining was negative for AFB.

TREATMENT

As per the guidelines on programmatic management of drug-resistant TB (PMDT) in India, after

Figure 1 Chest radiograph demonstrating a non-homogenous opacity in right upper zone. There are artefacts that are caused by metallic hooks of clothing worn by the patient.

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Figure 2 Contrast chest CT axial apical image showing a non-homogeneously enhancing right upper lobe mass-lesion.

the pretreatment evaluation, the patient was started on an intensive phase regimen that included Kanamycin, pyrazinamide, ethambutol, ethionamide, levofloxacin and para-amino salicylic acid (PAS).

OUTCOME AND FOLLOW-UP

After initiation of treatment, the patient started getting symptomatic relief after 2 weeks of therapy, which included disappearance of fever and reduction in the frequency of cough. Her appetite improved and there was a gradual increase in weight. The ESR fell to 20 mm in the first hour. After about 6 months of treatment the patient developed PAS and/or ethionamide-induced hypothyroidism for which levothyroxine was advised. During the course of treatment a repeat bronchoscopy for BAL fluid examination/culture was advised to the patient but she refused. We were left with no option but to keep a close watch on the clinico-radiological picture of the patient at regular intervals in our outpatient clinic. Fortunately, the patient is asymptomatic now with marked reduction in the size of the radio-opacity as seen in [figure 4](#).

DISCUSSION

In its 2012 global report on tuberculosis, WHO estimated that 3.7% (range 2.1–5.2%) of new cases and 20% (range 13–26%) of previously treated cases had multidrug-resistant (MDR)

Figure 3 Contrast chest CT coronal reformat image showing a non-homogeneously enhancing right upper lobe mass lesion.

tuberculosis.⁴ The case burden is highest in low-income countries such as India due to multiple reasons including the presence of HIV infection. In a routine outpatient clinic it is not uncommon to find patients of pulmonary tuberculosis having cough with no or minimal sputum production, especially if the lesion is of a non-cavitating and infiltrative type. The clinical presentation of our patient indicated an infective aetiology but the chest radiographic picture was suggestive of a lung mass. According to a study by Cha *et al*,⁵ in patients with extensively drug-resistant (XDR) TB, the common radiographic abnormalities found were nodules (15 of 15 patients, 100%), reticulo-nodular densities (11 of 15, 73%), consolidation (9 of 15, 60%) and cavities (7 of 15, 47%), located mainly in upper and middle lung zones. No significant differences were found in imaging findings of XDR TB and MDR TB patients. In a retrospective analysis, Rolston *et al*⁶ studied the frequency and nature of infections mimicking lung cancer and noticed that among those patients who were eventually found to have an infective aetiology, mycobacteria accounted for 27% of cases. Their data indicate that pulmonary infections mimicking neoplasms are not very common. To rule out the possibility of a malignant lung lesion in our patient, we performed USG-guided Tru-cut lung biopsy. McWilliams *et al*⁷ found that in cases of suspected active pulmonary tuberculosis who were either smear negative or were unable to produce sputum, three-induced sputum tests showed significantly greater diagnostic yield in comparison to bronchoscopy. In another study by Schoch *et al*,⁸ it was found that in cases where sputum specimens were smear negative, the diagnostic yield of bronchoscopy was higher than that of two-induced sputum samples. Considering the possibility of drug-resistant tuberculosis (DRTB), we planned to perform a diagnostic flexible bronchoscopy when sputum induction failed to provide an adequate sample. A combination of microbiological evidence of infection along with the histopathological examination of the tissue sample was helpful in arriving at the final diagnosis. The distinctness of this case is, first, the atypical radiological presentation of MDR TB and, second, the importance of diagnostic bronchoscopy when non-invasive methods of sputum collection are unsuccessful. Every effort should be made to obtain a sample for microbiological evidence of infection when suspecting DRTB. Once the diagnosis of MDR TB is

Figure 4 Follow-up chest radiograph after six months of second-line antitubercular treatment.

made, the ideal way to monitor treatment success is by culture conversion on follow-up culture results, apart from clinical improvement.

Learning points

- ▶ In cases where the radiographic image is inconsistent with symptomatology of the patient, invasive methods such as flexible bronchoscopy and lung biopsy should be considered.
- ▶ Diagnostic flexible bronchoscopy can be helpful in those cases where sputum induction methods have failed, especially in cases suspicious of an infective aetiology.
- ▶ In previously treated patients with pulmonary tuberculosis (TB) presenting with recurrent symptoms a few weeks to months after completion of anti-TB therapy, a possibility of multidrug-resistant tuberculosis should be kept in mind and tested for, accordingly.

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Competing interests None.

Patient consent Obtained.

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