



Case Report

Disseminated tuberculosis with symptoms of decreased consciousness: A rare case in Indonesian male

Alvian Fauzi, Ariani Permatasari*

Department of Pulmonology and Respiratory Medicine, Faculty of Medicine, Universitas Airlangga – Dr. Soetomo General Academic Hospital, Surabaya, Indonesia



ARTICLE INFO

Keywords:

Disseminated tuberculosis
GeneXpert
Anti-tuberculosis drug

ABSTRACT

Background: Disseminated tuberculosis is a rare case that causes high mortality and morbidity.

Case presentation: A 59-year-old man with a glasgow coma scale of 12, cerebrospinal fluid was found to have dominant mononuclear, high protein level, low glucose level and shortness of breath. A chest X-ray revealed a right pleural effusion with infiltrates in both lung parenchyma and a pleural fluid adenosine deaminase (ADA) test showed 66.1 U/L. Thoracolumbar MRI revealed a compression fracture in the 6th thoracic vertebral body. The patient was given category 1 anti-tuberculosis drug (ATD) therapy plus streptomycin and dexamethasone and water seal drainage (WSD) was installed. The patient experienced improvement after taking ATD after 4 months in which the patient could stand and walk by using an object in front of him.

Discussion: Accurate and prompt diagnosis of disseminated tuberculosis minimizes patient's mortality and morbidity. Suspicion of tuberculosis can be raised if the patient is experiencing health problems in endemic tuberculosis.

Conclusion: Disseminated tuberculosis (pulmonary tuberculosis, tuberculous pleurisy, tuberculous meningitis, and tuberculous spondylitis) can be managed properly using ATD category 1.

1. Introduction

Tuberculosis (TB) is an infectious disease caused by a microorganism called Mycobacterium Tuberculosis (MTB) [1]. Disseminated tuberculosis is a very rare TB case because the organs infected with MTB consist of 2 or more organs that are not closely located [2]. The number of disseminated tuberculosis cases globally is still unclear, but recent reports suggest that >2–20% of pulmonary TB patients have disseminated tuberculosis [3]. The challenge in managing disseminated tuberculosis is the process of establishing an early diagnosis because it does not have specific symptoms [4]. We would like to report a case of disseminated tuberculosis in an Indonesian male who had symptoms of decreased consciousness. We report our case based on the Surgical Case Report (SCARE) 2020 guidelines [5].

2. Case Presentation

A 59-year-old Javanese man had decreased consciousness, can't lift both legs (paraplegia), stiff neck, shortness of breath, coughing up phlegm, and intermittent fever. The patient experienced decreased appetite, weight loss of 5 kg in 1 month and night sweats. The patient also had difficulty of urinating and defecating since 1 week. The patient had no history of high blood pressure, diabetes mellitus, heart disease, chronic liver disease, and asthma. The patient had never received an anti-tuberculosis drug (ATD).

The general condition of the patient was weak and the glasgow coma scale (GCS) was 12. Laboratory examination revealed an increase in neutrophils (81.6%) and a decrease in lymphocytes (6.7%). Radiographic examination of the AP chest X-ray revealed an homogenous

* Corresponding author. Department of Pulmonology and Respiratory Medicine, Faculty of Medicine, Universitas Airlangga – Dr. Soetomo General Academic Hospital, Jl. Mayjend Prof. Dr. Moestopo No. 6-8, Airlangga, Gubeng, Surabaya, East Java 60286, Indonesia.

E-mail address: arianipermatasari0921@gmail.com (A. Permatasari).

<https://doi.org/10.1016/j.amsu.2021.103209>

Received 12 November 2021; Received in revised form 19 December 2021; Accepted 20 December 2021

Available online 22 December 2021

2049-0801/© 2021 The Author(s). Published by Elsevier Ltd on behalf of IJS Publishing Group Ltd. This is an open access article under the CC BY-NC-ND license

(<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

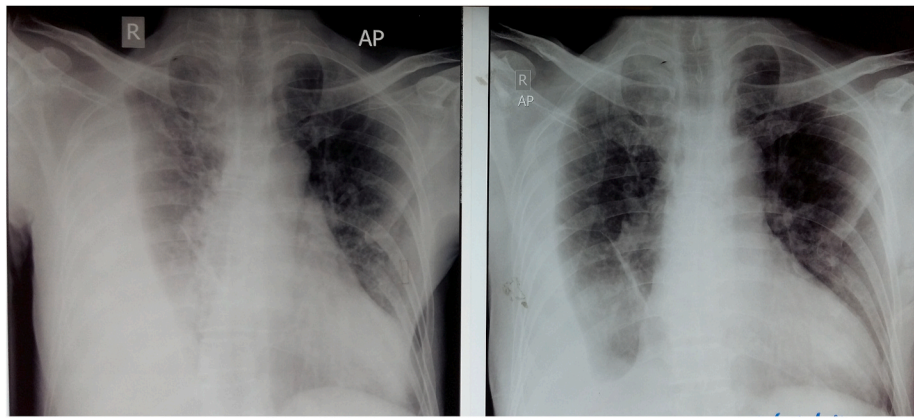


Fig. 1. Right pleural effusion in hemithorax and right and left suprahilar infiltrate.

opacity in the lower 1/3 of the right hemithorax which supported a right pleural effusion with infiltrates in both lung parenchyma which matched the picture of active pulmonary TB (Fig. 1). Examination of cerebrospinal fluid (CSF) analysis showed dominant mononuclear results, high protein levels, and low glucose levels, supporting the diagnosis of tuberculous meningitis. The patient was given ATD category 1 therapy plus streptomycin for the initial 2 months of treatment and dexamethasone for the initial 6 weeks of treatment with periodic tapering off every week.

On the fourth day, the adenosine deaminase (ADA) test showed 66.1 U/L which supported the diagnosis of tuberculous pleurisy. Since a pleural effusion is known, serial thoracentesis has been performed. The patient's consciousness was *compos mentis*, CT-Scan with contrast in head area showed no abnormalities. Both legs can be moved but cannot stand. On the next day, the sputum GeneXpert MTB/RIF examination showed that MTB was detected low, and rifampicin was sensitive. An x-ray of the thoracolumbar spine revealed a collapse of the 6th thoracic vertebrae, leading to tuberculous spondylitis.

After several days of treatment, the patient did not improve with thoracentesis. The patient and family were willing to do water seal drainage (WSD) installation. The results of thoracolumbar magnetic resonance imaging (MRI) revealed a wedge fracture/compression fracture in the 6th thoracic vertebrae that led to tuberculous spondylitis (Fig. 2). The patient was advised to use a thoracolumbosacral orthosis. After the second day of WSD installation, the x-ray results showed it was expanding although it was not perfect. After 1 month of treatment, the pleural fluid production in WSD was only ± 50 cc/24 hours, so WSD was removed. The patient was still unable to stand up properly, but it was acknowledged that the pain in his back has reduced. The patient was advised to continue outpatient with ATD category 1 and was advised for surgery on the 6th thoracic vertebral body but the patient refused. Four months post treatment, the patient could stand and walk by using the support from the object in front of him.

3. Discussion

Disseminated tuberculosis is a rare case and has the potential to

increase the mortality of tuberculosis patients, which is estimated that 5.4% of tuberculosis patients who develop disseminated tuberculosis [4]. Management of disseminated tuberculosis is tailored to the organ infected with *Mycobacterium tuberculosis* (MTB), in which the problems arise in our case are meningitis tuberculous, pulmonary tuberculosis, tuberculous pleurisy, and tuberculous spondylitis. This condition is caused by a decrease in CD4 and CD8 that leads to a weak body condition and makes it easier for MTB to spread to several organs [6,7]. In our case, the patient had a decreased level of consciousness and a CT scan showed no abnormalities. Suspicion of tuberculous meningitis can be considered when the patient lives in the territory of countries with endemic tuberculosis such as Indonesia [8,9]. The diagnosis of tuberculosis can be made using GeneXpert MTB/RIF for fast and efficient confirmation [10,11].

In the case of disseminated tuberculosis, it is important to pay attention to the speed and accuracy in making the diagnosis to minimize morbidity and mortality [12]. Management of disseminated tuberculosis is generally similar to new cases of tuberculosis, which is providing ATD category 1 for 12 months according to the management of extrapulmonary tuberculosis. The ATD category 1 consists of 2 months treatment with rifampin, isoniazid, pyrazinamide, and ethambutol, and 10 months with rifampin and isoniazid [11,13]. In our case, streptomycin was added because streptomycin has stronger ability to penetrate the blood brain barrier where the patient also had tuberculous meningitis. In addition, steroids can be used to minimize the occurrence of neurological deficit disorders [14,15]. In this case, pleural effusion was also found where the installation of WSD was effective to restore lung expansion [16].

Tuberculous spondylitis in our case was not treated with surgery considering minimum destruction and deformity of the spine. In addition, an earlier diagnosis of tuberculosis makes category 1 ATD effective [17,18]. Immobilization measures are taken to minimize further compression of the spine [19]. Management of disseminated tuberculosis using ATD category 1 is effective if the diagnosis is made early by considering the tuberculosis endemic area.

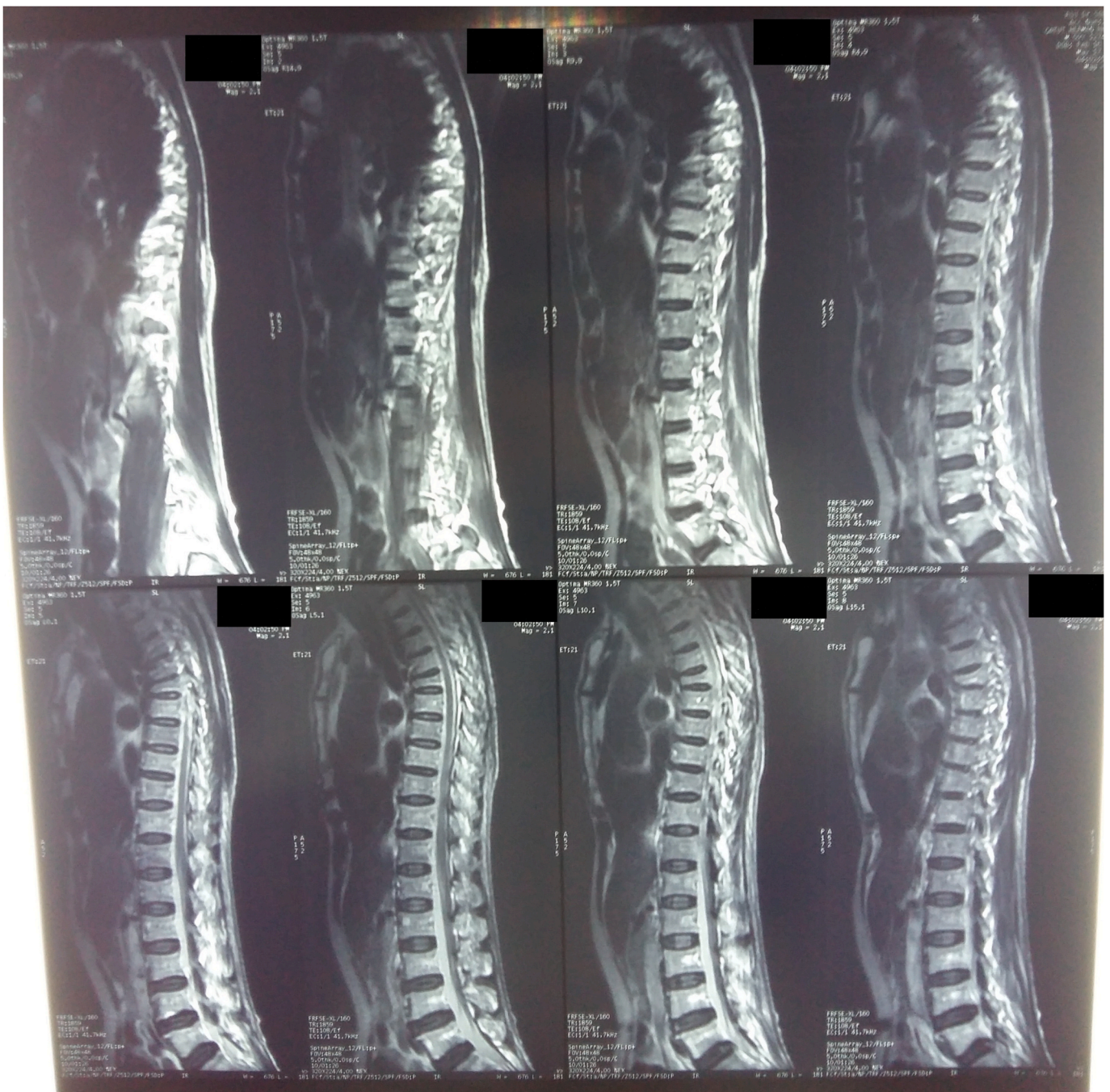


Fig. 2. Contrast thoracolumbar MRI shows wedge fracture of the 6th thoracic vertebrae.

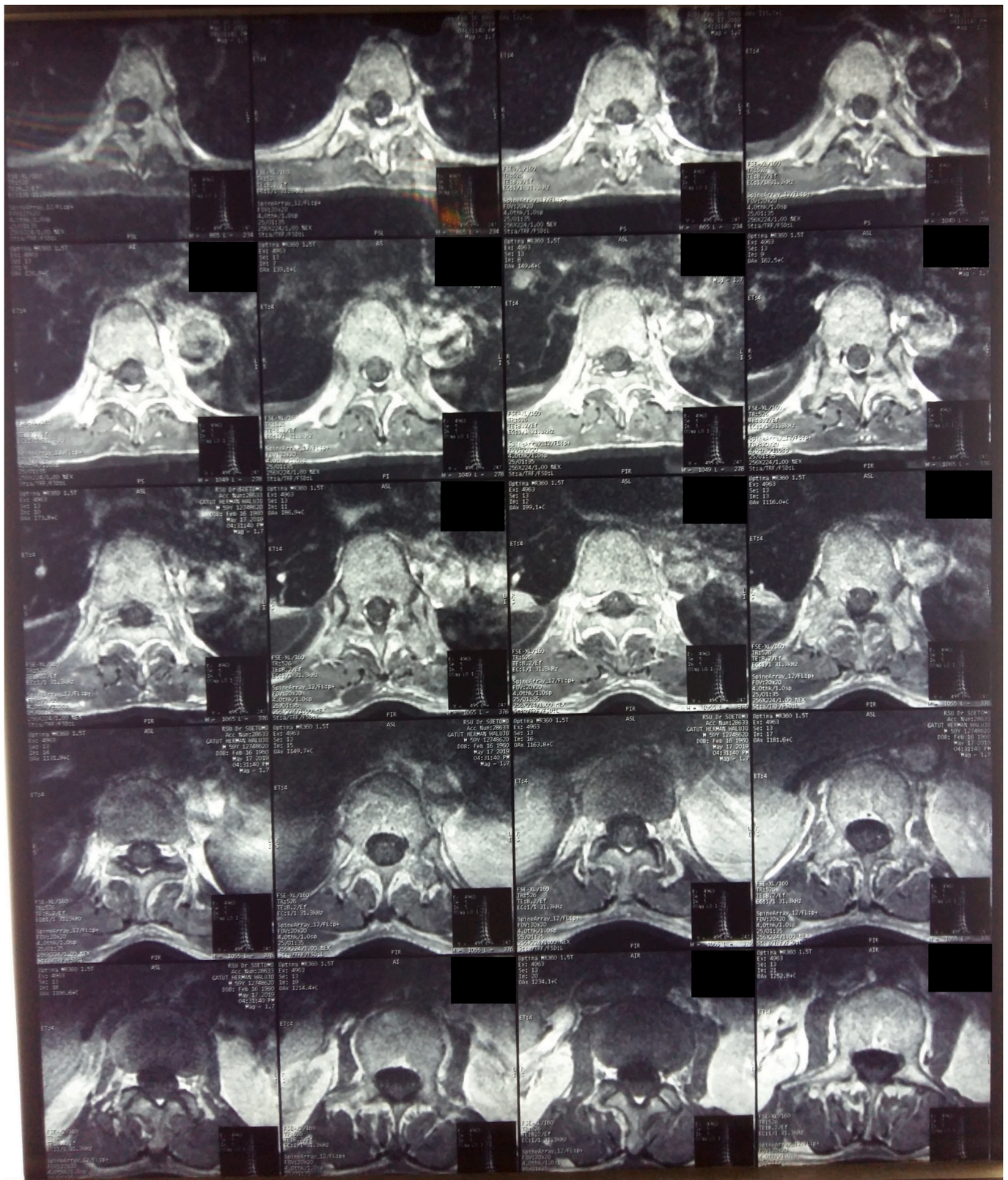


Fig. 2. (continued).

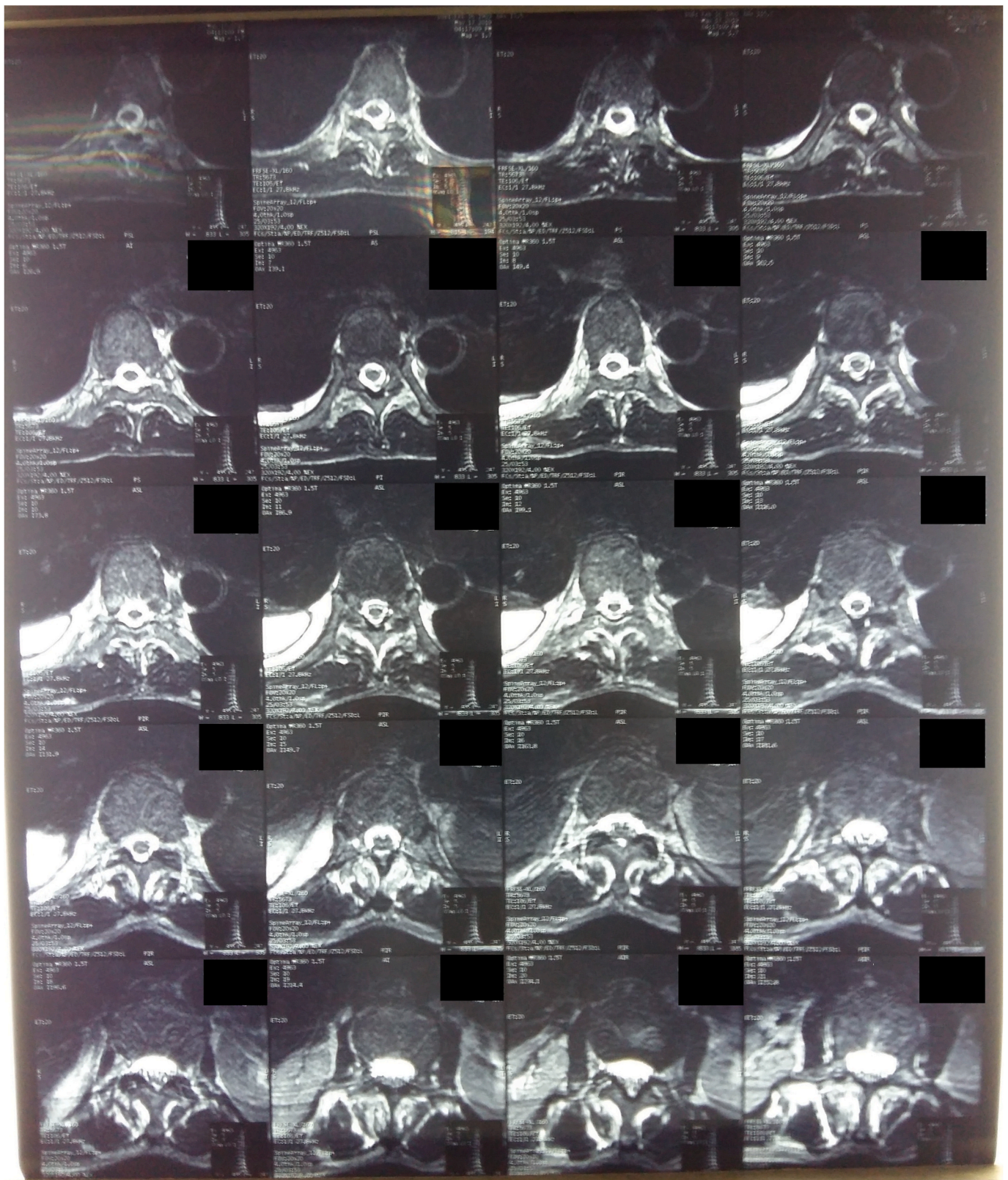


Fig. 2. (continued).

4. Conclusion

A 59-year-old man with disseminated tuberculosis has been confirmed to have pulmonary tuberculosis, tuberculous pleurisy, tuberculous meningitis, and tuberculous spondylitis. The patient is given ATD category 1 plus streptomycin and steroids followed by thoracentesis which then replaced with WSD. The use of ATD category 1 which should have been 6 months is extended to 12 months (2 months of intensive phase and 10 months of continuation phase). The patient's prognosis has improved with sequelae in the form of decreased function of the lower extremities.

Ethical approval

We have conducted an ethical approval base on the Declaration of Helsinki at Ethical Committee in Dr. Soetomo General Academic Hospital, Surabaya, Indonesia.

Sources of funding

None.

Author contribution

All authors contributed toward data analysis, drafting and revising the paper, gave final approval of the version to be published and agree to be accountable for all aspects of the work.

Research registration number

1. Name of the registry:
2. Unique Identifying number or registration ID: .
3. Hyperlink to your specific registration (must be publicly accessible and will be checked): .

Guarantor

Ariani Permatasari.

Patient consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Provenance and peer review

Not commissioned, externally peer-reviewed.

Declaration of competing interest

The authors declare no conflict of interest.

Acknowledgement

We would like to thank Fis Citra Ariyanto as our editor.

References

- [1] N.M. Mertaniasih, D. Kusumaningrum, E.B. Koendhori, T. Kusmiati, D.N. Dewi, Nontuberculous mycobacterial species and Mycobacterium tuberculosis complex coinfection in patients with pulmonary tuberculosis in Dr. Soetomo Hospital, Surabaya, Indonesia, *Int. J. Mycobacteriol.* 6 (1) (2017) 9–13, <https://doi.org/10.4103/2212-5531.201894>.
- [2] A.D. Kerkhoff, D.A. Barr, C. Schutz, R. Burton, M.P. Nicol, S.D. Lawn, et al., Disseminated tuberculosis among hospitalised HIV patients in South Africa: a common condition that can be rapidly diagnosed using urine-based assays, *Sci. Rep.* 7 (1) (2017) 10931, <https://doi.org/10.1038/s41598-017-09895-7>.
- [3] F.Y. Khan, Review of literature on disseminated tuberculosis with emphasis on the focused diagnostic workup, *J. Family Commun. Med.* 26 (2) (2019) 83–91, <https://doi.org/10.4103/jfcm.JFCM.106.18>.
- [4] J.Y. Wang, P.R. Hsueh, S.K. Wang, I.S. Jan, L.N. Lee, Y.S. Liaw, et al., Disseminated tuberculosis: a 10-year experience in a medical center, *Medicine* 86 (1) (2007) 39–46, <https://doi.org/10.1097/MD.0b013e318030b605>.
- [5] R.A. Agha, T. Franchi, C. Sohrabi, G. Mathew, A. Kerwan, The SCARE 2020 guideline: updating consensus surgical CAse REport (SCARE) guidelines, *Int. J. Surg.* 84 (2020) 226–230, <https://doi.org/10.1016/j.ijsu.2020.10.034>.
- [6] E. Petruccioli, T. Chiacchio, I. Pepponi, V. Vanini, R. Urso, G. Cuzzi, et al., Characterization of the CD4 and CD8 T-cell response in the QuantiFERON-TB gold plus kit, *Int. J. Mycobacteriol.* 5 (Suppl 1) (2016), <https://doi.org/10.1016/j.ijmyco.2016.09.063>, S25–s6.
- [7] C.R. Diedrich, H.P. Gideon, T. Rutledge, T.M. Baranowski, P. Maiello, A.J. Myers, et al., CD4CD8 Double Positive T cell responses during Mycobacterium tuberculosis infection in cynomolgus macaques, *J. Med. Primatol.* 48 (2) (2019) 82–89, <https://doi.org/10.1111/jmp.12399>.
- [8] G.E. Marx, E.D. Chan, Tuberculous meningitis: diagnosis and treatment overview, *Tuberc. Res. Treat.* (2011), 798764, <https://doi.org/10.1155/2011/798764>, 2011.
- [9] M.A. Schaller, F. Wicke, C. Foerch, S. Weidauer, Central nervous system tuberculosis : etiology, clinical manifestations and neuroradiological features, *Clin. Neuroradiol.* 29 (1) (2019) 3–18, <https://doi.org/10.1007/s00062-018-0726-9>.
- [10] Dolli P. Soedarsono, Comparison of serum neopterin levels in pulmonary tuberculosis patients with positive acid fast bacilli and inactive pulmonary tuberculosis, *J. Clin. Tubercul. other Mycobact. Dis.* 18 (2020) 100138, <https://doi.org/10.1016/j.jctube.2019.100138>.
- [11] T. Kusmiati, N.M. Mertaniasih, J.N. Eko Putranto, B. Suprapti, Luthfah N. Soedarsono, et al., Correlation of inflammatory cytokines on corrected QT interval in rifampicin-resistant tuberculosis patients, *Ann. Med. Surg.* 70 (2021) 102862, <https://doi.org/10.1016/j.amsu.2021.102862>.
- [12] B.B. Smith, B.J. Hazelton, A.E. Heywood, T.L. Snelling, K.M. Peacock, K. Macartney, Disseminated tuberculosis and tuberculous meningitis in Australian-born children; case reports and review of current epidemiology and management, *J. Paediatr. Child Health* 49 (3) (2013) E246–E250, <https://doi.org/10.1111/jpc.12035>.
- [13] J.Y. Lee, Diagnosis and treatment of extrapulmonary tuberculosis, *Tuberc. Respir. Dis.* 78 (2) (2015) 47–55, <https://doi.org/10.4046/trd.2015.78.2.47>.
- [14] G. Thwaites, M. Fisher, C. Hemingway, G. Scott, T. Solomon, J. Innes, British Infection Society guidelines for the diagnosis and treatment of tuberculosis of the central nervous system in adults and children, *J. Infect.* 59 (3) (2009) 167–187, <https://doi.org/10.1016/j.jinf.2009.06.011>.
- [15] J.H. Chin, Tuberculous meningitis: diagnostic and therapeutic challenges, *Neurol. Clin. Pract.* 4 (3) (2014) 199–205, <https://doi.org/10.1212/cpj.000000000000023>.
- [16] J.M. Porcel, Chest tube drainage of the pleural space: a concise review for pulmonologists, *Tuberc. Respir. Dis.* 81 (2) (2018) 106–115, <https://doi.org/10.4046/trd.2017.0107>.
- [17] S. Rajasekaran, D.C.R. Soundararajan, A.P. Shetty, R.M. Kanna, Spinal tuberculosis: current concepts, *Global Spine J.* 8 (4 Suppl) (2018) 96s–108s, <https://doi.org/10.1177/2192568218769053>.
- [18] D.C.R. Soundararajan, R.B. Rajasekaran, S. Rajasekaran, A.P. Shetty, R.M. Kanna, Drug-resistant spinal tuberculosis - current concepts, challenges, and controversies, *J. Clin. Orthop. Traumatol.* 11 (5) (2020) 863–870, <https://doi.org/10.1016/j.jcot.2020.07.028>.
- [19] L.N. Yong, F. Ahmedy, K.N. Yin, J.P. Engkanan, Functional outcomes in spinal tuberculosis: a review of the literature, *Asian Spine J.* 15 (3) (2021) 381–391, <https://doi.org/10.31616/asj.2020.0086>.