Para-aortic and Meningitis Tuberculosis: A Case Report

Reviono[1,2], Sari Apriliana R[1],Yusup Subagio Sutanto[1,2], FX Soetejo[3], Subandrio[4]

[1]Department of Pulmonology and Medical Respiration,Universitas Sebelas Maret
[2]Dr. Moewardi Hospital, Surakarta
[3]Department of Medical Neurology, Faculty of Medicine,
Universitas Sebelas Maret Dr. Moewardi Hospital, Surakarta
[4]Department of Cardiothoracic-Surgery, Faculty of Medicine,
Universitas Sebelas Maret/Dr. Moewardi Hospital, Surakarta

ABSTRACT

Background: In 2018, Indonesia was at the third place as the country with the highest incidence of tuberculosis (TB) in the world. In addition to pulmonary TB, extrapulmonary TB cases are also quite large. Lymphadenitis of the aortic TB can cause a fatal risk if not treated immediately. This study aimed to explore para-aortic and meningitis tuberculosis case in Klaten Hospital, Central Java.
Case presentation: There was a 24-year-old woman with complaints of missing chest pain for 2 months, fear of seeing light (photophobia), and decreased consciousness. The patient was a referral from Klaten Hospital with a diagnosis of mediastinal tumor. The chest radiograph shows a picture of homogeneous opacity in the anterior mediastinum. Bronchoscopy results show compression stenosis in 1/3 distal and blunt carina. After a sternotomy, it was obtained pus (pus) and tissue granuloma in the area of the aorta. After the rapid molecular test was carried out, the results showed that M tuberculosis detected. The results of histopathology of anatomical pathology show epitheloid tubercle and Datia Langhans cells that suggest an infection with M. tuberculosis. Therapy was done by giving a standard anti-tuberculosis drug, namely Rifampicin 450 mg, INH 300 mg, Ethambutol 1000 mg and Pyrazinamide 1000 mg. The patient's condition improved marked by weight gain in 2 months.
Conclusion: In the case of pulmonary masses (mediastinal tumors), we need to be aware of the possibility of cases of TB lymphadenitis because Indonesia is a country with a high prevalence of TB. This is because a slow diagnosis can lead to life-threatening conditions

Keywords: Tuberculosis, para aorta limfadenitis, meningitis TB, tumor mediastinum, sternotomy

Correspondence:
Reviono. Department of Pulmonology and Medical Respiration, Universitas Sebelas Maret Jl. Ir. Sutami 36A, Surakarta 57126, Central Java, Indonesia. Email: reviono@staff.uns.ac.id. Mobile: +62818474671.

BACKGROUND

Indonesia was in the third placeas the country with the highest incidence of TB in the world in 2018 after India and China. Tuberculosis (TB) is an infectious disease caused by Mycobacterium tuberculosis. Tuberculosis is transmitted through inhalation of M. Tuberculosis-infected droplets from patients to other people. Mycobacterium tuberculosis can spread through the bloodstream or lymph causing extra pulmonary TB (WHO, 2018; Zumla et al, 2013).

TB bacteria mostly attacked the lungs but can hit other organs and are referred to as extrapulmonary TB (WHO, 2018; Baddeley et al. 2013; Jong, 2012). Cases of extrapulmonary TB in the world based on the 2018 Global Tuberculosis Report were

estimated to be at 14% of 6,400,000 in 2017. Cases of extra-pulmonary TB in Indonesia were recorded at 15,697 of all new TB cases totaling 331,424 (Baddeley et al., 2013). Cases of reducing tuberculosis and paraaortic tuberculosis lymphadenopathy were very rare. Management of extra-pulmonary tuberculosis is an anti-tuberculosis drug. Lymphadenitis of the aortic TB can cause a fatal risk if not treated immediately. Progress made in recent years in medical management and tuberculosis surgery has encouraged the management of tuberculosis which primarily affects the aorta. This disease is important because it will cause serious consequences if not treated. Generally, the aorta becomes involved with a direct extension of the periaortic focus such as tuberculosis lymphatic nodes or abscess and ultimately results in aneurysm or perforation or both. Fatal complications can be prevented by early recognition and immediate surgical intervention (Jong, 2012).

This report of a rare case of para-aorta tuberculosis lymphadenitis is a best practice that explains from a radiological finding that it looks like a mediastinal mass turns out to be a case of tuberculosis infection, and cases of TB meningitis which are life-threatening cases. This case highlights the importance of considering the possibility of tuberculosis in lymphadenopathy that is suspect as a mediastinal tumor.

CASE PRESENTATION

24-year-old woman to the emergency room of Dr. Moewardi hospital on February 28, 2018 was referred from Klaten Hospital with a suspected mediastinal tumor, because there was a picture of the mass on the chest X-ray and thorax CT scan. Patients present with chest complaints feel pain since 2 months before entering the hospital. Chest pain often arises and go and does not penetrate backwards.

The patient denied having a history of diabetes mellitus, allergies, hypertension and heart. Patients often closed their eyes if there was bright light, fear of light (photophobia). Patients also experienced a decrease in consciousness. On laboratory cerebrospinal fluid examination, cell 3 results were obtained and glucose decreased in number 29. From the results of Magnetic resonance imaging (MRI) there were hypodense lesions in the right ganglia ward (in figure 1) patients were diagnosed as tuberculous meningitis and received anti-tuberculosis drug therapy since August 8, 2017, Category 1 month to VII phase anti-tuberculosis drugs with FDC Rifampicin 150 mg and INH 150 mg 3 times a week (Monday, Wednesday, Friday) until now.

Cerebrospinal fluid examination history showed immuno-examination of PCR TB (-), PCR HSV (-), microbiology CMV PCR (-). Analysis of cerebrospinal fluid on 7/15/2017 found the results of cell number 3, protein 15.3, glucose 29, nonne negative, pandy negative, chloride L 115.

The condition at admission was moderate, somnolence and nutrition were sufficient withweight 55 kilograms (kg), height 155 centimeters (cm), with Body Mass Index (BMI) 22.89 (normoweight). Vital signs of 110/70 millimeter mercury (mmHg), breath rate 19 times per minute (x/minute) regularly, sufficient depth, pulse rate 92 x/ minute regular rhythm, full contents and axillary temperature 36.8ºC, pain score 5. Lung physical examination was obtained by inspections of static and dynamic right chest development similar to the left, palpation of fremitus raba right the same as left, dim percussion on Costa Inter Spatium II-IV in right hemithorax and sonor on left, auscultation of right lung vesicular base sound decreased at SIC II IV

in the right hemithorax and normal on the left, no dry cracks or wheezing are obtained. Examination of the abdomen and extremities was carried out within normal limits.

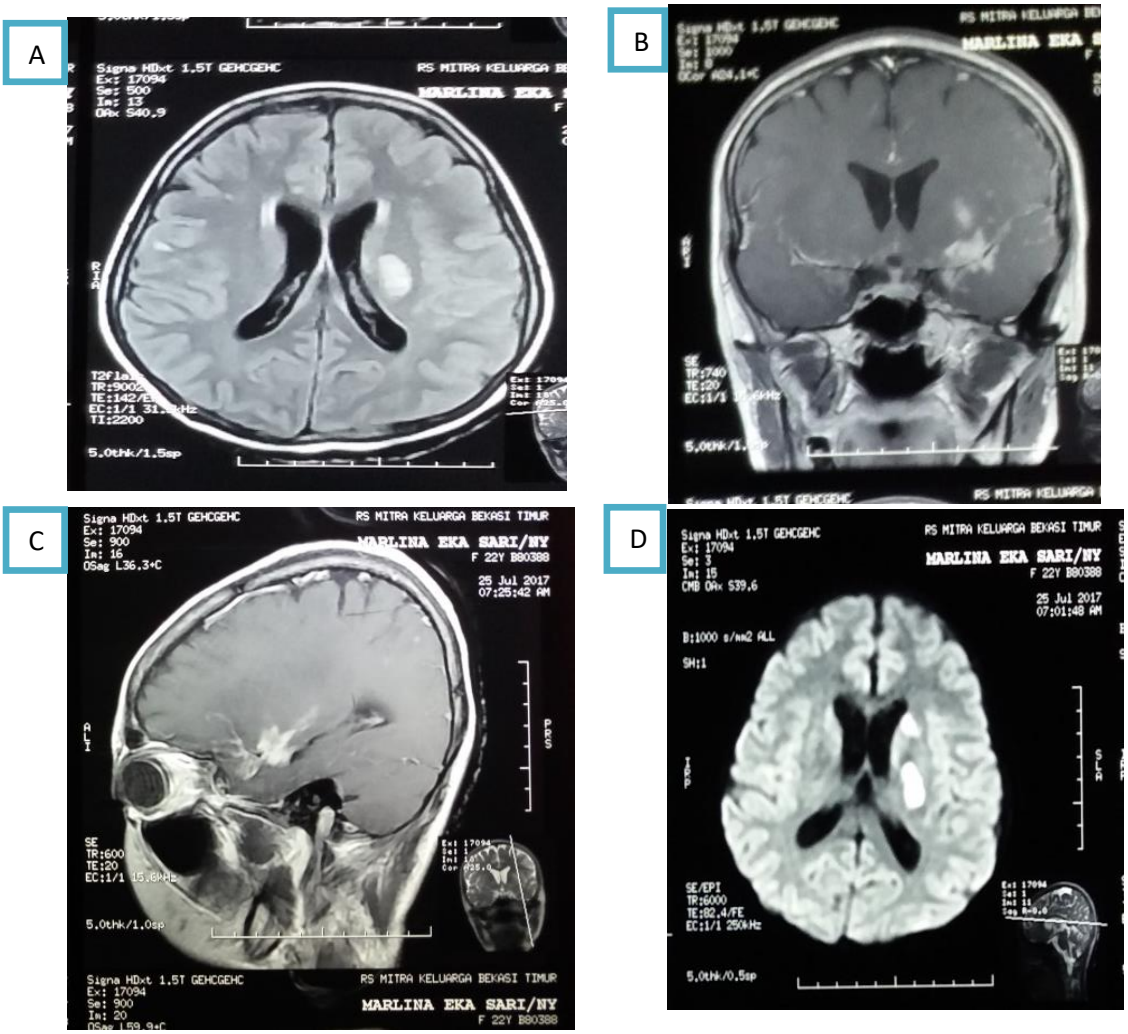

Figure 1. A-D MRI of the head with enhancement in the right basal ganglia

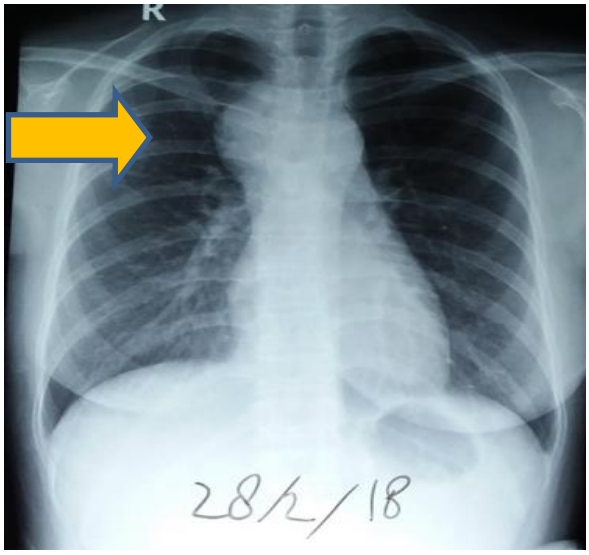

Figure 2.AP / lateral chest X-ray with suspected anterior mediastinal mass

Blood laboratory results show that it is within normal limits. Examination of Human Immunodeficiency Virus (HIV) shows that it is non reactive. PA / lateral chest X-ray results in a homogeneous opacity in the anterior mediastinum. After contrast thoracic multislice computed tomograph (MSCT), a picture of the mass in the paraaorta was obtained as shown in figure (2). Bronchoscopy examination February 20, 2018 concluded that compression stenosis was partially in 1/3 distal trachea and OPEN, blunt carina.

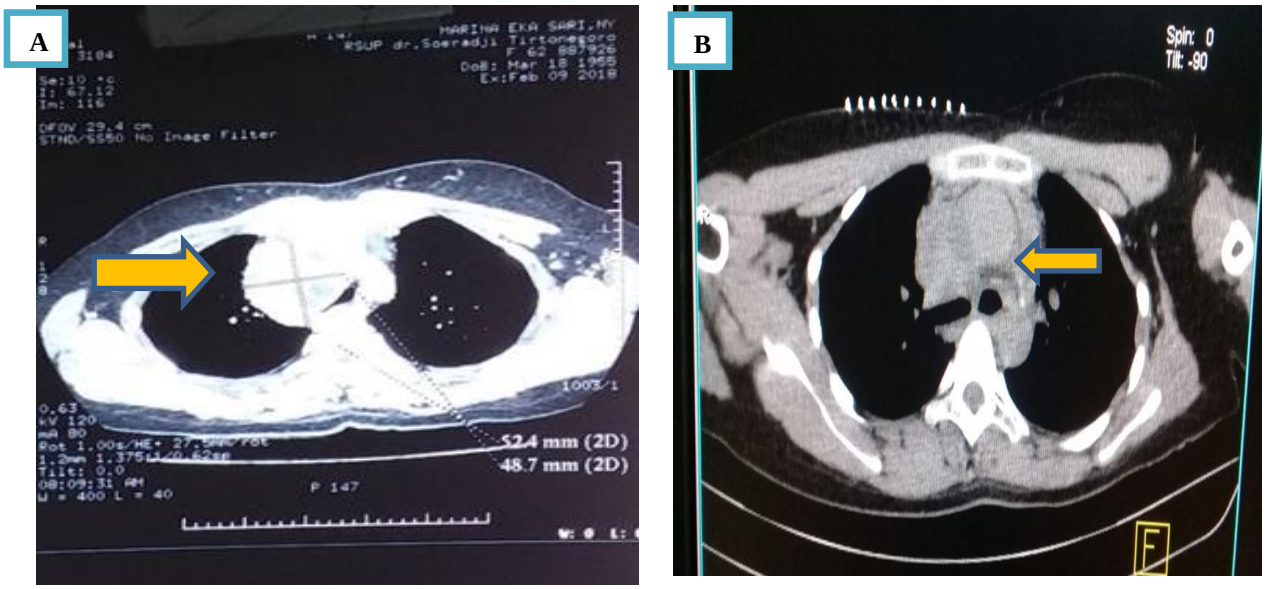

Figure 3.A-B.Description of paraaortic mass on thoracic CT scan

Patients were given therapy for anti-tuberculosis category I drugs namely Rifampicin (R) 1x450mg, Isoniazid (H) 1x300 mg, (E) Ethambutol 1 x 1000 mg, (Z) Pyrazinamide 1 x 1000 mg. The patient is then operated on by a sternotomy. The pus (pus) and granuloma tissue in the aortic region as seen in Figure 4, pus exploration and granuloma tissue extraction are seen. Then carried out rapid molecular test (gene X-pert) network.

Postoperative patients were treated in an intensive care unit (ICU), then an AP / lateral chest X-ray was performed as shown in figure 6. Performed rapid molecular tests of lymph tissue, culture and sensitivity of microorganisms and anatomical pathology. The results of rapid molecular tests of lymph tissue were Mtuberculosis Detected Medium, Rifampicin resistance not detected, the result of growth-free microorganism cultures. Anatomic pathology Thymus and lymph node tissue results from sclerosing mediastinitis, sarcoidosis/necrotizing sarcoidosis, granulomatosis, as shown in figure 6 A-C.

TB lymphadenitis response to the standard six-month anti-tuberculosis drug regimen was the initial phase 2 RHZE and the RH continuation phase is much longer than pulmonary TB, longer treatment for TB meningitis (Singh et al., 2018). Post-operative evaluation and outpatient care 1 month chest pain decreases, appetite increases. The final evaluation of the second month after surgery and anti-tuberculosis

drug therapy the patient had no longer felt chest pain, the weight went up 4 kg (BB 54 kg) and never had a complaint of dizziness. Evaluation at the end of the second month after surgery and anti-tuberculosis drug therapy showed clinical and radiological improvement so that anti-tuberculosis medication was continued with Rifampicin 1x450 mg and INH 1x300 until now. The patient's condition is now getting better, appetite and weight gain (5 kg in 2 months).

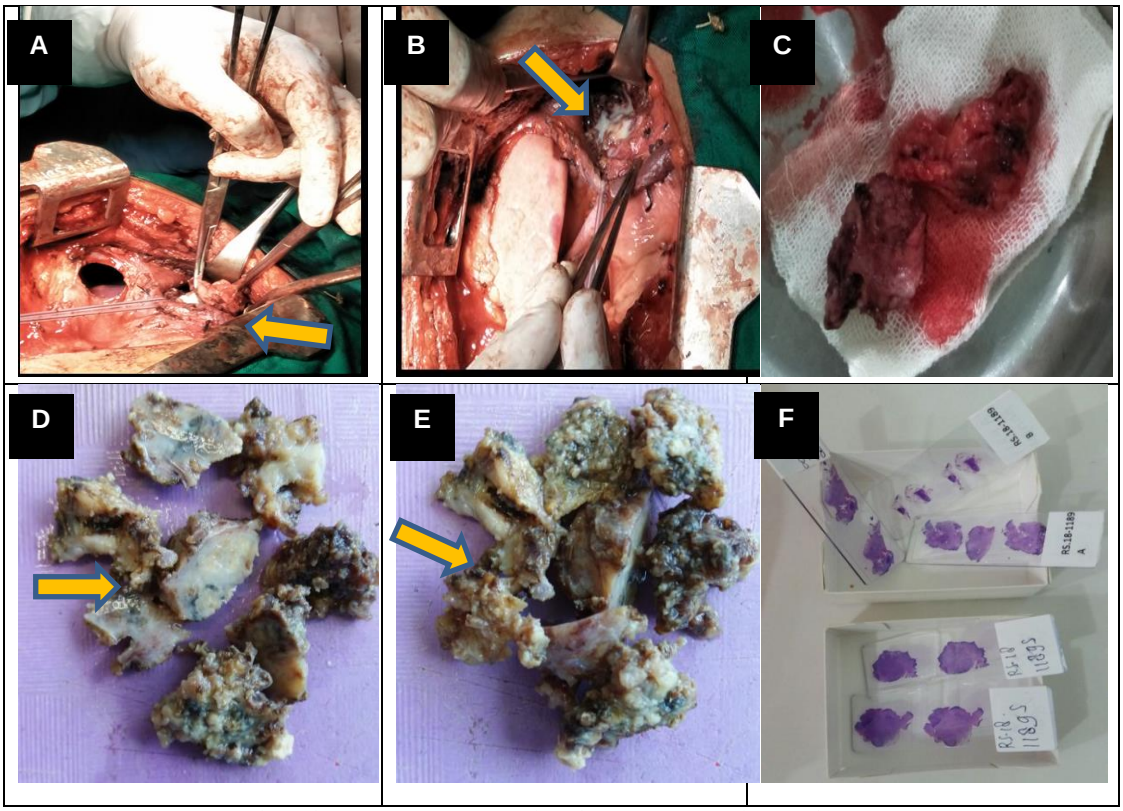

Figure4.(A-B). Pus in the paraaorta during an exploration sternotomy was seen. (C). Pieces of thymus tissue. (D-E).Pieces of granuloma tissue In para aorta.(F). Slide on anatomical pathology examination

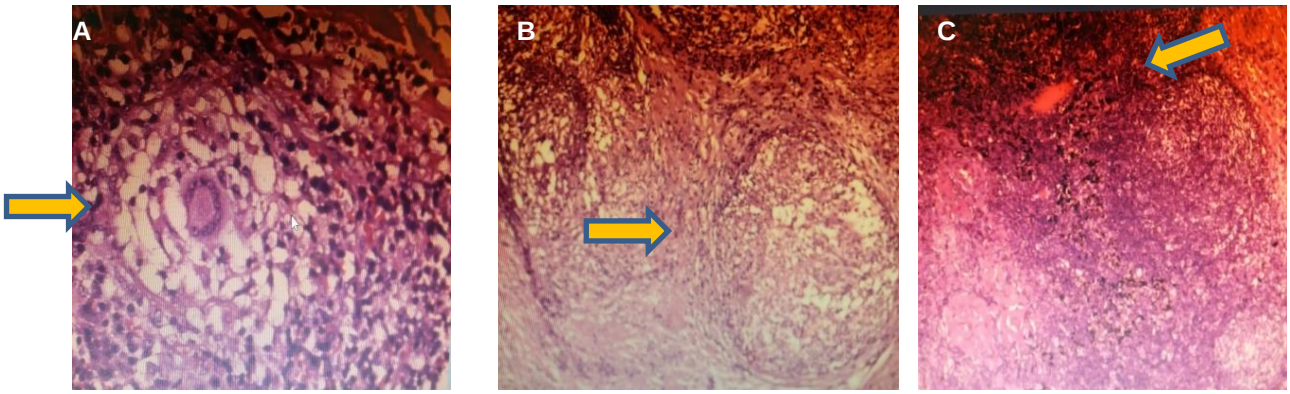

Figure 5.Results of pathology examination of lymphatic anatomy on March 22, 2018. A. epitheloid tubercles with giant cells (H&E, 40X) B. Giant cell langhans (H&E, 20X). C. Bone fragments with the focus of Datia langhans cells (H&E, 20X).

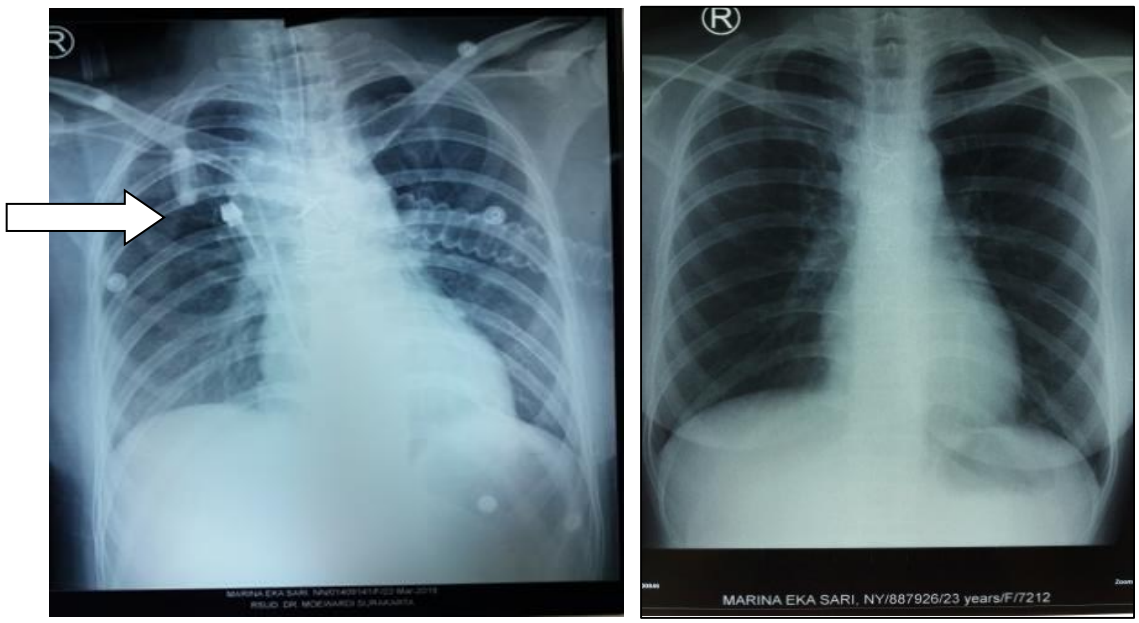

Figure 6. A. Chest X-ray postoperative evaluation in March 2018 it appears that homogeneous opacity in the mediastinum is reduced compared to before surgery. B. Chest X-ray evaluation at the end of the 12th month of anti-tuberculosis drugs, July 4th 2018 the lung is within normal limits

DISCUSSION

Cases of extrapulmonary TB in Indonesia were recorded to be at 15,697 of all new TB cases totaling 331,424. Pulmonary tuberculosis was a TB case involving the pulmonary parenchyma or tracheobronchial, while extrapulmonary TB was a TB case involving organs outside the lung parenchyma such as the pleura, lymph nodes, abdomen, genitourinary tract, skin, membranes of the brain, joints and bones. Reactivation of TB can occur in all organs where the tubercle bacillus spreads during primary infection. The form of extrapulmonary tuberculosis such as chest wall cold abces, paravertebral abscess occurs due to the displacement of tubercles from the pleural cavity to the parasternal lymph glands and paraaorta followed by rupture of the percutaneous focus in the lymph glands so that the infection spreads to surrounding tissues. Other forms of spread, for example in genitourinary TB, were caused by tubercles from the pleural cavity entering the lymph glands, but leakage occurs so that microorganisms enter the bloodstream and spread to distant organs or tissues. Constitutional symptoms of extra-pulmonary TB include fever, anorexia, weight loss, malaise, and fatigue. Other symptoms appear according to the infected organ. Lymph node swelling in the neck or armpit shows the possibility of TB lymphadenitis. Stiff neck, impaired consciousness indicates the possibility of TB meningitis (Aderaye et al, 2007).

Tuberculosis can occur in all organs where the tubercle bacillus spreads during primary infection. The form of the spread of TB germs has several strategies in manipulating the immune response of infected hosts so they can avoid elimination and stay alive. Components of the Mycobacterium tuberculosis cell wall such as mannosecapped lipoarabinomannan (ManLAM) and 19-kDa lipoprotein were identified as modulating the antigen presentation pathway and paralyzing the microbicidal function of

macrophages and other immune cells. Other reactivities, for example, in genitourinary TB are caused by tubercles from the pleural cavity entering the lymph glands, but leakage occurs so that microorganisms enter the bloodstream and spread to distant organs or tissues (Sharma et al, 2004).

Tuberculous meningitis is the most fatal and deadly form of tuberculosis by causing permanent sequelae. This disease is the fifth most common pulmonary tuberculosis and is estimated to be around 5.2% of all cases of extrapulmonary tuberculosis and 0.7% of all tuberculosis cases. TB meningitis usually occurs due to rupture of the subependimal tubercles into the subarachnoid cavity or because of hematogenous spread of miliary TB. Onset of meningitis occurs slowly with symptoms of subfebric fever, malaise, headache, and photophobia. Central nerve paralysis especially in nerves III, IV, and VI (Sokolove et al, 2010). Most involvement of cerebral TB is in the basal brain, with local arterial and venous vasculitis. Basal ganglia blood vessels are most commonly affected and are usually associated with movement disorders. Current acute clinical symptoms are cranial nerve deficits, headache, meningismus, and changes in mental status. The prodromal symptoms that can be found are headache, vomiting, photophobia, and fever. Electrolyte disturbances such as hypnatremia can occur. Cerebrospinal fluid protein content (CSS) increases, glucose levels are low, white blood cell counts are 0-1500 cells/cc with the dominance of lymphocytes, but at the initial stage is dominated by PMN cells. Acid fast bacilli cultures from CSS with one lumbar puncture gave positive results in 37% of cases. Aspirates from serial lumbar puncture give positive results in 90% of cases. The description of CT scan and MRI (Magnetic Resonance Imaging) examination in patients with tuberculous meningitis is normal at the onset of the disease. As the disease progresses, a picture that is often found is enhancement in the basal area, visible communicant hydrocephalus accompanied by signs of brain edema or early focal ischemia. It can also be found that silent tuberculomas are usually in the cerebral cortex or thalamus area. Treatment of TB meningitis starts with a four-drug regimen (RHZE). Provision of anti-tuberculosis drug therapy is recommended for 9-12 months. Recommended corticosteroids, prednisone 60–80 mg once daily and subsequently reduced in 4–6 weeks. Anti-tuberculosis drug regimens are given postoperatively to prevent further spread (Sokolove et al, 2010).

TB lymphadenitis is the most frequent manifestation of extrapulmonary TB (42%) (Kreider, 2008). Lymphadenitis in developing countries is more often caused by infection with Mycobacterium tuberculosis. TB lymphadenitis is common in children but is most common in young adult women with an age of 20-40 years. 70% of TB lymphadenitis patients only affect the cervical lymph nodes, 7% regarding the inguinal area, 7% regarding the axylary region, and 16% regarding some areas (Golden et al, 2005; Lam et al, 2010). TB lymphadenitis is often found in the hilar and mediastinal regions. Lymphadenitis often occurs unilaterally but bilateral abnormalities can occur due to lymphatic drainage that crosses in the lower chest and neck area. The process of TB lymphadenitis is divided into several stages. In the early stages the nodules are enlarged, painless, supple, well-defined, and semimobile. The next stage the nodule begins to harden, attaches to the surrounding tissue, and the skin above it starts to appear swollen and red. The central part of the nodule fluctuates, indicating an abscess starts and

eventually forms a sinus. Rupture of nodules can result in the spread of infection to nearby nodules and the sinus tract that is formed can last for years and sometimes requires surgical removal of the sinuses. Treatment without treatment can occur at any stage with the formation of scar tissue and calcification, but more often develops into caseosa and necrosis (Hopewell et al, 2010; Starke, 2011).

First-line management is an anti-tuberculosis drug. The response of TB lymphadenitis to the standard six-month anti-tuberculosis drug regimen is the initial phase 2 RHZE and the advanced phase 4 RH is much longer than pulmonary TB. Nodules can enlarge, new nodules may appear, and fistulas can form during treatment, although at the end of treatment it can grow and relapse after treatment is rare. Corticosteroid treatment is used to shrink the intrathoracic glands and as a bronchodilator, especially in children. Surgical excision must still be combined with anti-tuberculosis drugs because lymphadenitis is part of a systemic infection so that when excision is carried out, the infection is resolved (Starke, 2011; Kreider et al, 2008).

This patient was found to have extrapulmonary TB infection, namely the aortic TB lymphadenitis, initially diagnosed as a mediastinal mass. The results of rapid molecular test (gene x-pert) examination of lymph tissue obtained M tuberculosis detected medium. The results of anatomical pathology of lymph tissue were obtained by granulomatosis, fibrosis, epitheloid cells and giant cell langhans. TB lymphadenitis occurs during primary infection or during reinfection or reactivation of previous infections. The pathogenesis of TB in this case occurs during primary infection or during reinfection or reactivation of previous infections. TB lymphadenitis is often found in the hilum and media regions. Droplets infected with inhalated tuberculosis M bacteria enter the alveoli. Basil M tuberculosis phagocytes by alveolar macrophages and some germs occur hematogenously. The form of extrapulmonary TB such as chest wall cold abcess, paravertebral abscess occurs because of the displacement of tubercles from the pleural cavity to the parasternal lymph glands and paraaorta followed by rupture of the percutaneous focus in the lymph glands (Sharma et al, 2004).

Patients had a history of TB meningitis complaining of dizziness, fever, weakness, weight loss. Patients often close their eyes if there was bright light (photophobia). Patients also experienced a decrease in consciousness. On laboratory examination of cerebrospinal fluid there were 3 cell results and glucose decreased in number 29, from the results of MRI there was enhancement in the right ganglia ward. TB meningitis resulted from the spread of hematogenous infection to meninges. During the course of TB meningitis through 2 stages. Early lesions are formed in the brain or meninges due to the spread of hematogenous bacilli during primary infection. Hematogenous spread can also occur in chronic TB, but this condition was rarely found. Furthermore, meningitis results from the release of bacilli and TB antigens from caseous focus (initial lesions in the brain) due to trauma or immunological processes, directly into the sub-arachnoid space. Treatment of TB meningitis starts with a four-drug regimen (RHZE). The concentration of isoniazid and pyrazinamide increases in CSS when meninges are inflamed. Rifampicin can penetrate the brain barrier. Provision of anti-tuberculosis drug therapy is recommended for 9-12 months. Corticosteroids namely prednisone 60–80 mg once daily and subsequently

reduced in 4–6 weeks. Ventricular shunting may be needed if hydrocephalus occurs. Anti-tuberculosis drug regimens in intracranial tuberculomas must be given before surgery. Corticosteroids can reduce edema and relieve symptoms of hospitalization.

This case report presented a case of aortic TB which was very rare, and cases of life-threatening TB meningitis. Previously the patient was suspected as a mediastin tumor, then sternotomy was performed and there was tissue granuloma. The results of M tuberculosis detected medium were found in rapid molecular test. Recommendations from this case are: in the case of pulmonary masses (mediastinal tumor) need to be aware of the possibility of cases of TB lymphadenitis because Indonesia was a country with a high prevalence of TB. It was because a slow diagnosis can lead to life-threatening conditions.

AUTHOR CONTRIBUTIONS

Reviono did para-aortic and meningitis tuberculosis surgery. Sari Apriliana R, Yusup Subagio Sutanto, FX Soetejo, and Subandrio did pathology assessment.

CONFLICT OF INTEREST

None.

FUNDING AND SPONSORSHIP

None.

ACKNOWLEDGEMENT

We would like to thank to Klaten Hospital, Central Java, Indonesia for giving permission in data cases collection.

REFFERENCE

Aderaye G, Apers L, Blanc L, Bloom A, Chakaya J, Corbett L, et al (2007). Simplified and standardized clinical management guidelines for extrapulmonary tuberculosis. In: Getahun H, editor. Improving the diagnosis and treatment of smear-negative pulmonary and extrapulmonary tuberculosis among adults and adolescents. Geneva: World Health Organization.

Baddeley A, Dean A, Dias HM, Falzon D, Floyd K, Garcia I, et al (2013). The burden of disease caused by TB. In: Raviglione M, editor. Global tuberculosis report 2013. Geneva: World Health Organization.

Golden MP, Vikram HR (2005).Extrapulmonary tuberculosis: an overview. Am Fam Physician.72:1761-8.

Hopewell PC, Maeda MK (2010). Tuberculosis. In: Mason RJ, Broaddus VC, Martin TR, King TE, Schraufnagel DE, Murray JF, et al., editors. Murray and Nadel's Textbook of Respiratory Medicine. 5th ed. Philadelpia: Elsevier.

Jong E (2012). Extrapulmonary tuberculosis: a challenging diagnosis. Johannesburgh: TB/HIV Symposium; 2012 Sept 16 [cited 2013 Jul 2]. Available from: http://www.anovahealth.co.za-/images/uploads/ExtrapulmonaryTB-Jong.pdf.

Kreider ME, Rossman MD (2008). Clinical presentation and treatment of tuberculosis. In: Fishman AP, editor. Fishman's pulmonary disease and disorders. 4th ed. New York: McGraw-Hill.

Kreider ME, Rossman MD (2008). Clinical presentation and treatment of tuberculosis. In: Fishman AP, editor. Fishman's pulmonary disease and disorders. 4th ed. New York: McGraw-Hill.

Lam PK, Catanzaro A, Perry S (2010). Diagnosis of pulmonary and extrapulmonarytubrculosis. In: Raviglione MC, Lenfant C, editors. Tuberculosis. 4th ed. New York: Informa Healthcare.

Sharma SK, Mohan A (2004). Review article: extrapulmonary tuberculosis. Indian J Med Res.120:316-53.

Singh P, Kant S, Gaur P, Tripathi A, Pandey S (2018). Extra pulmonary tuberculosis: An overview and review of Literature. Int.J. Life. Sci. Scienti. Res.4(1):1539-41.

Sokolove PE, Derlet RW (2010). Tuberculosis. In: Marx JA, Hockberger RS, Walls RM, editors. Rosen's emergency medicine-concepts and clinical practice.7th ed. Philadelphia: Elsivier.

Starke JR (2011). Tuberculosis (Mycobacterium tuberculosis). In: Kliegman RM, editor. Nelson textbook of pediatrics.19th ed. Philadelphia: Elsevier.

WHO [World Health Organization] (2018). Global tuberculosis report 2018. Geneva: WHO; 2018. WHO/-CDS/TB/2018.20.

Zumla A, Raviglione M, Hafner R, Reyn CF (2013). Current concepts: tuberculosis. N Engl J Med.368:745-55.