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Bronchiectasis as Silent a Serious Sequelae Lung TBC

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Abstract: ***Introduction: Patients who recover from pulmonary tuberculosis infection have the possibility of developing post-infection effects like TB sequelae. This TB sequela does not immediately cause symptoms but can appear 10-20 years after the infection is declared cured, therefore there needs to be a follow-up examination to determine the symptoms and damage to lung tissue. Case: A 55-year-old male patient is an outpatient at the Mangusada Hospital, Badung, who had a history of TB in 1993 and was declared cured, but this year the patient experienced symptoms of shortness of breath during light activities such as walking. On PA chest X-ray examination, it was found that there was a giant cavity in the right area with the possibility of pneumothorax. When spirometry was performed, the results were obstructed and restricted breathing. After we do a CT scan we found there is large cavity and atelectasis. Discussion: in some cases the cavity is a sign of infection in the early stages of tuberculosis as a result of the reaction of phagocytic cells and the existing MTB. The results of the respirometer that show restriction and obstruction are an early sign of infection and can also be a symptom after infection. The long term effect the patient having shortness of breath and cough and will affect the patient's spirometry due to mixed airway disorders. Conclusion: to know the post-TB symptoms accurately, we need to look at the lung tissue through HRCT to know accurately and also lung function because many lung diseases cause the same symptoms and to perform different therapies. Patients can be given symptomatic therapy and medical rehabilitation to improve lung function.***

Keywords: TubercUlosis (TB), Sequelae Tuberculosis

1. Introduction

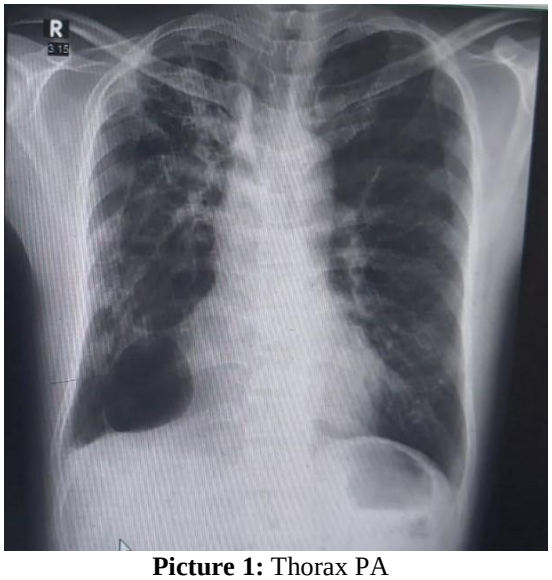
Tuberculosis is a disease that has existed throughout human history, which is widespread throughout the world. Mycobacterium tuberculosis can infect all vital organs in humans but infection to the lungs is the most common. The majority of the way of transmission is through sputum when coughing is issued by the patient. This sputum will stick to the environment as an active agent that can cause infection which will be greatly influenced by the body's immunity so that not all mycobacteria that enter can cause infection.4

Sequelae of tuberculosis is an event experienced by patients who have had TB infection in the lungs where a large cavity will form which will cause a decrease in lung function even though the germs in the body are not active. According to data taken by WHO from 2018-2022 there is 40 million people get treatment and over 30 million people get preventive treatment for latent TB infection. TB patients who are cured can progress to an estimated half of which can become Sequela TB, which will cause a decrease in the quality of life of patients due to shortness of breath in daily life plus when doing strenuous physical activities. Therefore, there is a need for detection methods and ways to reduce the symptoms of shortness of breath that occur.[1-3]

2. Case

The patient is a 55 year old man who has a history of TB since 25 years ago with treatment in 1993 and there is no history of smoking cigarettes, with a complaint of about 6 years starting mild shortness of breath at the beginning until after walking for several years he felt lost when doing activities such as climbing stairs and long walks. The patient is currently being treated at the pulmonary poly at the Mangusada Badung Kapal Hospital with treatment in the form of 2 inhaler drugs, namely Seretide as controller treatment and Berotec inhaler as a reliever treatment. In addition, we at the hospital provide treatment for tightness capsules containing methylprednisolone, theophylline and ceterizin with use if symptoms of shortness of breath occur.

On physical examination, the patient has a general impression of being weak with compos mentis consciousness with a vital sign of the patient's blood pressure of 120/70 mmHg with a pulse of 74x/minute with a temperature of 36.7 ^{0}C and the saturation of the patient is 98% without any breathing apparatus. On physical examination, the lungs on inspection looked normal, with normal fremitus sounds in both lungs but on auscultation a whezing sound was found on the patient's right which was clearly audible at the apex of the lung but even so, vesicular sounds were clearly audible in both lung fields and no crackles were found.



Picture 1: Thorax PA

Posterior Anterior chest x-ray examination showed a kp duplex with a giant cavity in the right paracardial area with the possibility of a right localized pneumothorax causing shortness of breath due to reduced lung volume.

The spirometry is examination to see the condition of the patient's breath and lung performance. Patients are required not to take inhaler or bronchodilator drugs for 12 hours to see the actual lung function. With the best Vital Capacity (VC) results of 2.49 ml and VC/ VC Prediction is 73%, the best Forced Vital Capacity (FVC) is 0.90 and FVC /FVC Prediction is 27%, the highest FEV is 0, 61 ml and TLC /TLC Prediction is 23.3%. The final result of FEV/TLC is 67% with the conclusion that the patient has a mixed lung work disorder with obstruction and restriction. In this examination the patient is positioned sitting instead of standing so that this form of examination is not good and accurate for assessing the patient's lung function.

Picture 2: Thorax CT-Scan

From the results of the CT scan without contrast, the results showed fibrosis with withdrawal of the left bronchial tree. The mediastinum to the left lateral is accompanied by collapse of the left lung; multiple cavities appear with diffuse size in both lung fields and giant cavities in the lower right lung field. There was also an infiltrate patch in the lower middle field of the right lung and the right parahillar. With the results, it is concluded that right lung atelectasis with multiple cavities and giant cavities in the right lung. From the radiologist perspective the giant cavity is formed cause by many bronchiectasis that collapse and form the giant cavity. Pneumonia was also found in the right parahiler.

In the future, patients will always have regular check-ups every month. If the patient feels there is a recurrence of symptoms, the check-up can be accelerated by up to 1 week. Self-check-ups, apart from regular check-ups, spirometry is also performed if the patient feels they are able to do it and performs periodic checks on the patient's rehabilitation therapy.

3. Discussion

Sequelae pulmonary tuberculosis includes a wide variety of radiological manifestations and involves the lung parenchyma, airways, pulmonary vasculature, pleura, and mediastinum. Common findings in treated tuberculosis patients are: thin-walled cavities, fibrosis, lung damage or collapse, aspergillus, bronchiectasis, and bullae. Pulmonary tuberculosis sequelae will cause serious problems in patients among which there is a decrease in function and affect morbidity, especially in adult and elderly patients later.[11-15]

A Study that conducted by Maryan GA in Pakistan for success rate treatment for TB and see if there any post TB syndrome after treatment showed that out of 155 patients only 9% of patients recovered completely from the disease and 91% patients had parenchymal and pleural sequelae after treatment after examination. We can conclude that post TB syndrome can generally appear after the treatment. So we must doexamintation for all lung TB patient after treatment may be 1 year after treatment. The data from this study is collected from all patient that got treatment in Indus hospital Karachi Pakistan.[9]

The damage experienced by Sequelae of tuberculosis is usually related to the passage of time and the associated development of the pleura. Where there will be development of a restrictive type of lung disease caused by the formation of pleural fibrosis. Causes a variety of symptoms such as coughing, weakness, dyspnoea, malaise, difficulty climbing stairs or managing daily activities or work. Another effect of the sequelae of tuberculosis also causes the lungs to be more susceptible to infections such as aspergilloma and infections from non-MTB bacteria.[10-13]

Several studies have found ineffective use of bronchodilators in patients with tuberculosis sequelae. Through the use of spirometry, we can calculate lung function accurately in this patient. We use the spirometry calculation technique without the presence of a bronchodilator which shows the results in the patient that there is a decrease in lung function caused by obstruction and restriction disorders or can be called a mixture. Cigarette smoking is one of the factors that affect lung health. even so in this case study patient had no history of smoking and still had sequelae. but we must not forget that apart from smoking, there are other factors, such as the patient's occupation. patients work in urban areas and work as farmers where every day they are exposed to vehicle fumes and pesticides.[14-15]

On spirometry, it was found that there was a decrease in respiratory function with a mixed type, namely the restriction and obstruction type, with the patient being somewhat difficult to examine the patient in a sitting position. In a study conducted by Kumar et al. We conducted a study on TB and non-TB patients and found that there was a decrease in lung function. Especially during strenuous exercise. The decrease in lung function is most severe in patients with TB sequelae.[14-15]

In a study conducted by Meyyapan D by observing 200 TB patients, it was found that there was a decrease in the ability to exercise and also radiological findings, while in spirometry there was no relationship with a decrease in spirometry.[7]

Pulmonary radiology found a collapse in the lung which causes the lung to lose volume. Cavities with thin walls that can be a place of infection for Aspergillus fumigatus. This cavity causes changes in the anatomy of the lung which will later cause obstruction due to narrowing of the pulmonary tract. Bronchiectasis is an event where there is widening of the airways to the destruction of the airways. The usual can be identified through the symptoms of cough with sputum which can cause hemoptysis due to recurrent bronchiectasis.

Study for x-ray finding by Deependra kumar study about radiological finding in sequelae TB. The result from 128 sample is 72, 8% is have residual lesion the form is fibrosis in lung parenchymal then second is bronchitacisis with 13%, the third is classification with 3.26% and last is cavity with 2.17 %. From this case study we found CT all this appearance the cavity, fibrois and some calsification.[5]

CT scan examination will find abnormalities in the form of fibrosis, cavities, pleural thickening, bronchiectasis which will affect lung work due to anatomical changes in the lungs by restriction and obstruction. Restriction is a disorder due to reduced inhalation capacity of the lungs, while obstruction causes a decrease in the expiratory capacity of the lungs. Bronchiectasis is a common finding in the sequelae of post-TB with reversible parenchymal fibrotic destruction and dilatation. Fibrothorax there can also be found.[5 – 8]

4. Conclusion

Tuberculosis is a disease that poses a major threat to patients where other infectious diseases when cured rarely cause side effects on the patient's body, while pulmonary tuberculosis can be a potential cause of decreased respiratory function in patients. Because of the side effects of post-pulmonary TB, when the patient begins to feel a sense of tightness, he is required to first perform a spirometry examination to see lung function before using further examinations such as a chest X-ray and then HRCT to more clearly assess the anatomy of the lungs. Patients with Sequele TB can take medication that works to widen the airways and pulmonary rehabilitation to support the patient's well-being. Rehabilitation therapy is expected to reduce the symptoms of shortness of breath from the patient. However, we do not forget to use sputum culture examination to ensure that there is no recurrence of the patient.

References

[1] World Health Organization. Global Tuberculosis Report 2019. Geneva: World Health Organization; 2019. Avaible from: https: //www.who. int/publications/i/item/9789241565714
[2] RachowA, Ivanova O, Robert W, Salome C. TB sequel: incidence, pathogenesis and risk factors of long-term medical and social sequelae of pulmonary TB – a study protocol, BMC Pulmonary Medicine, 2019. Avaiblefrom: https: //link. springer. com/article/10.1186/s12890-018-0777-3
[3] Rafeah K, Nuzhat I M, Abdul R, Imaging of Pulmonary Post-Tuberculosis Sequelae. Pak J Med Sci.2020 doi: 10.12669/pjms.36. ICON-Suppl.1722
[4] Giovanni et al. History of prevention, diagnosis, treatment and rehabilitation of pulmonary sequelae of tuberculosis. La Presse Médicale.2022. Avaible from: https: //doi. org/10.1016/j. lpm.2022.104112
[5] DeependraK. R, Rahul K. Identification of risk factors for radiological sequelae in patients treated for pulmonary tuberculosis: Prospective observational

cohort study.2020 Volume 67, Issue 4, October 2020, Pages 534-538. https: //doi. org/10.1016/j. ijtb.2020.07.026

[6] Rachow A, Ivanova O, Wallis R, Charalambous S, Jani I, Bhatt N, et al. TB sequel: incidence, pathogenesis and risk factors of long-term medical and social sequelae of pulmonary TB – a study protocol. BMC Pulm Med 2019; 19: 4. Avaible from: https: //link. springer. com/article/10.1186/s12890-018-0777-3

[7] Meyyappan, D, Chockalingam, P. Evaluation of respiratory impairment and health related quality of life in pulmonary tuberculosis sequelae patients. VHL Regional Portal.2018. Avaible from: https: //pesquisa. bvsalud. org/portal/resource/pt/sea-193906

[8] Kumar S, Anjana T, Karan M, Geetanjali B. Pulmonary Functions and Inflammatory Biomarkers in Post-Pulmonary Tuberculosis Sequelae. Tuberc Respir Dis (Seoul) 2022.85 (2): 175–184. doi: 10.4046/trd.2021.0127

[9] Maryan GA, Zubair SM, Talha S, Afshan Y, Muhammad I. Post tuberculosis sequelae in patients treated for tuberculosis: An observational study at a tertiary care center of a high TB burden country, European Respiratory Journal 2018 52: PA2745 doi; 10.1183/13993003. congress-2018. PA2745

[10] Hemanth IK, Binuraj C. Clinical Pearl in Pulmonology. Jaypee Brother Medical Publisher.2018 p115-118

[11] Micheal A, Jack A, Robert M, Allan I, Robert M. Fishman Pulmonary Diseases and Disorder Fifth Edition. McGraw-Hill Education.2015. p 2012-2025

[12] Loscalzo, Joseph. Harrisons Pulmonary and Critical Care Medicine 3rd Edition. McGraw-Hill Education.2017 p 45

[13] Pallav L, Felix J, Gary L, Gerald J. Essential Of Clinical Pulmonology. Taylor and Francis Group.2019 p 384 – 397

[14] Nishant et al. Post-tuberculosis sequelae and their correlation with quality of life: An observational study at a tertiary care center of north India. Department of Medicine, Beaumont Health 2021. https: //doi. org/10.1101/2021.10.04.21264524

[15] Kaviyarasi P. S. Comparison Of Respiratory Function Of Treated Tuberculosis Patients Among Smokers And Non Smokers. Tirunelveli Medical College Department Of Thoracic Medicine.2019 http: //repository-tnmgrmu. ac. in/10973/1/201700819kaviyarasi. pdf

Author Profile

I Gede Jordi Surya Prayogi, young general practitioner who has an interest in the lung field and hopes to learn about tuberculosis and its long-term effects

Ni Putu Ayu DiahPuspita Sari, Pulmonary specialists have long-standing experience in their fields who accompany interns and provide good directions

Widastuti Dharmapala, a radiology specialist who has a close relative at the hospital and is ready to help in terms of reading radiology samples