

VARIOUS ASPECTS OF ACINAR LESIONS

— The Key Finding of Pulmonary Tuberculosis on HRCT —

Hitoshi TOKUDA

Abstract Acinar lesions, a pathologist's naming for granulomatous lesions formed in the peripheral air space, that is, in the bronchiole or its adjacent alveolar space, is very characteristic and pathognomonic for tuberculosis on HRCT imaging. As a radiological term, it is equal to centrilobular nodule or branching shadow, or tree-in-bud appearance in the recent trend. It is universally seen in most of tuberculosis cases, irrespective of its stage or extensity. Although thus common, its appearance is not always uniform. Firstly they are not well defined in some cases. Exudative tendency in pathological process may explain for this appearance. Secondly they are not always arranged in an orderly manner or in other words centrilobular manner on CT, but often in a random fashion. Pathologically this phenomenon can be explained by the randomness of formation site of granulomas or by scarring in spontaneous healing process of the disease. Finally, although rare, an extreme pattern, in which acinar lesions are diffusely disseminated in both lung fields without other type of lesions, is well known as Oka's Classification of Pulmonary Tubercu-

losis Type IIB. This rare type of tuberculosis could be formed through indolent dissemination of bacilli via the airway or from the hematogenous dissemination. It should also be noted that in tuberculous pneumonia, especially when it develops in emphysematous lung, acinar lesions is not seen, making differential diagnosis difficult.

Key words: Acinar lesion, HRCT, Centrilobular, Tree-in-bud appearance, Oka's Classification of Pulmonary Tuberculosis Type IIB

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Current Topics : Medical Images of Pulmonary Mycobacterioses

THE CHEST CT FINDINGS AND PATHOLOGIC FINDINGS
OF PULMONARY TUBERCULOSIS

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Abstract The past research of the radiologic manifestations of pulmonary tuberculosis in Japan was based on morphological pathology of the untreated patient autopsy. I would like to show the chest CT scan of tuberculosis diseases with caseous granuloma at its exudative reaction, proliferative reaction, productive reaction, cirrhotic reaction until self cure. This progress reflects the normal cell mediated immunological responses. Also I would like to show the cavitation of granuloma, which results from liquefaction of caseous materials during the course and results in the formation of the source of infection. And finally I would like to show the morphological differences of acinous lesion, acino-nodular lesion and caseous lobular pneumonia. These differences reflect the amount of bacilli disseminated in the peripheral parts under the lobules. In this study, I do not show old age cases and HIV

positive cases, who do not form typical granuloma due to the decreased cell mediated immunity and whose X ray findings are atypical.

Key words : Pulmonary tuberculosis, Caseous granuloma, Morphological pathology, Radiological manifestation, Chest CT scan

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————— **Current Topics : Medical Images of Pulmonary Mycobacterioses** —————

**CHEST X-RAY IMAGE FINDINGS OF
MYCOBACTERIUM AVIUM COMPLEX (MAC) LUNG DISEASE**

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Abstract Recently *Mycobacterium avium* complex (MAC) lung disease has increased in number remarkably in Japan. The MAC lung disease is divided into four types: a nodular bronchiectatic disease, a fibrocavitary disease, a hypersensitivity like disease, and a disseminated disease. Since the latter two types are rare, it is important in the diagnosis and treatment to understand the images of the former two. Formerly the fibrocavitary disease was more common, which occurred in the preceding tuberculous lesion frequently and showed images similar to tuberculosis. But recently the nodular bronchiectatic disease has increased in number particularly. Characteristic feature of this type is involving the right middle lobe and left lingual segment overwhelmingly in nonsmoking, immunocompetent, middle-aged women. Common CT manifestations of the nodular bronchiectatic disease include

nodules just beneath the pleura, consolidation including bronchiectasis, and, lung volume shrinkage.

Key words: *Mycobacterium avium* complex (MAC), Nodular bronchiectatic disease, Fibrocavitary disease, Hypersensitivity like disease, Disseminated disease

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RADIOGRAPHIC FINDINGS OF
PULMONARY NONTUBERCULOUS MYCOBACTERIOSIS OTHER THAN
MYCOBACTERIUM AVIUM COMPLEX

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Abstract Almost all nontuberculous mycobacteria (NTM) cause opportunistic infection. Therefore, the radiographic findings of NTM have a tendency of nonspecific patterns modifying the predisposing conditions or diseases and we could not extract species specific radiographic characterizations in that situations. In this review, the NTM cases without predisposing conditions or diseases are submitted essentially.

Mycobacterium kansasii cases show more or less the same patterns with TB cases. *Mycobacterium fortuitum* case shows nonspecific consolidations. *Mycobacterium xenopi* case shows solitary cavity in the upper lobe area. *Mycobacterium gordonae* case shows the same cavitary pattern. *Mycobacterium abscessus* case shows widely scattered tree-in-bud appearance foci.

Weak virulence NTM like as *Mycobacterium xenopi* or *Mycobacterium gordonae* may form solitary cavity without

predisposing conditions.

The pattern of bronchial wall thickening seems to be one of the specific findings with NTM pulmonary infection.

Key words: Nontuberculous mycobacteriosis, *Mycobacterium kansasii*, *Mycobacterium fortuitum*, *Mycobacterium xenopi*, *Mycobacterium gordonae*, *Mycobacterium abscessus*

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————— Current Topics : Medical Images of Pulmonary Mycobacterioses —————

DIFFERENTIAL DIAGNOSIS OF PULMONARY MYCOBACTERIAL INFECTION;
RADIOLOGICAL FINDINGS MIMICKING TUBERCULOUS OR
NONTUBERCULOUS MYCOBACTERIAL PNEUMONIA

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Abstract Radiological imaging is one of the important clues for diagnosis of pulmonary mycobacterial infection. Differential diagnosis of pulmonary tuberculosis and nontuberculous mycobacterial infection is following; bacterial pneumonia, bronchopneumonia, mycoplasma pneumonia, pulmonary fungal infection, diffuse panbronchiolitis, sinobronchial syndrome, sarcoidosis, Wegener's granulomatosis, bronchiole-alveolar carcinoma, pulmonary malignant lymphoma, and pneumoconiosis. Characteristic findings of bronchial tuberculosis are chronic productive cough with no radiological finding, lobar atelectasis, or mucoid impaction of bronchi. Radiologic findings of pulmonary mycobacterial infection are multiple infiltration, centri-lobular nodules which sometime adhere, cavity, and solitary nodule, however, these findings mimic bacterial pneumonia and bronchopneumonia especially in case of immunosuppressive patients. Pulmonary tuberculosis predominantly appears in upper lobe and the top of lower lobe of S⁶. Nontuberous mycobacterium pulmonary infection

predominantly affects middle lobe and lingual lobe, accompanying with bronchial wall thickness and bronchiectasis. It is difficult to diagnose pulmonary mycobacterial infection using pulmonary imaging alone, therefore bacterial examination from sputum or bronchoalveolar lavage fluid should be necessary.

Key words : Centri-lobular nodule, Cavity, Tuberculous pneumonia, Differential diagnosis, Immunosuppressant

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A CASE OF STERNOCLAVICULAR JOINT TUBERCULOSIS WITH RENAL FAILURE DUE TO RIFAMPICIN

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Maki MIYAMOTO, and Akihiko WADA

Abstract A 79-year-old man was admitted to a previous hospital complaining of left precordial swelling. Chest CT scan showed destruction of left sternoclavicular joint and a mass of 5 cm in diameter. Needle biopsy was performed and the diagnosis of sternoclavicular joint tuberculosis was made on the basis of presence of *M. tuberculosis* in the specimen. The patient was treated with isoniazid, ethambutol, rifampicin, and pyrazinamid but he developed renal failure. Then, he was transferred to our hospital. All medications were suspended because of the possibility of the side effect of drugs. We performed renal biopsy and histopathological examination revealed interstitial nephritis and minimal-change glomerulonephritis. From the result of examination, we considered interstitial nephritis was due to rifampicin. The treatment with 50 mg/day of prednisolone and isoniazid, ethambutol, and levofloxacin was administered and renal failure and precor-

dial mass were improved. Tuberculous arthritis usually affect hip and knee joint and sternoclavicular joint involvement is very rare.

Key words: Sternoclavicular joint tuberculosis, Bone and joint tuberculosis, Rifampicin, Drug-induced interstitial nephritis

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Case Report

A CASE OF DISSEMINATED BCG INFECTION FOUND DURING TREATMENT OF AN INFANT WITH CROHN'S DISEASE

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Abstract Bloody stools, diarrhea and perianal abscesses were observed from the age of two months infant. The boy received a BCG vaccination at the age of four months. The patient was diagnosed as having Crohn's disease at the age of six months by intestinal endoscopy. Based on the diagnosis, he was treated with nutrition therapy, salazosulfapyridine, and prednisolone. Fever of unknown origin occurred two months after he had taken azathioprine at the age of two years and two months. *Mycobacterium tuberculosis* was detected from a gastric aspirate, and he was diagnosed as having disseminated BCG infection by means of the multiplex PCR method. Chest CT showed miliary pulmonary nodules in both lungs on admission. Physical examination revealed enlarged lymph-nodes, which were palpable around the neck and groin, and hepatomegaly. Laboratory data were within normal ranges except a slightly increased peripheral white blood cell and serum CRP level. He was treated with rifampicin (15 mg/kg/day), isoniazid (15 mg/kg/day) for 12 months, and streptomycin (25 mg/kg/day) for two months. He became afebrile a week after starting the treatment, and the miliary pulmonary nodules in both lungs had disappeared by 5 months after starting the treatment. An abnormality of the NEMO gene, which is the gene responsible for ectodermal dysplasia and immunodeficiency, was identified at the age of three years.

It is assumed that an abnormality of the NEMO gene caused a latent BCG infection over a period of one year and ten months, and immunosuppressive medicine (azathioprine) induced a disseminated BCG infection. This case report supports that anti-tuberculosis medicine should be given to prevent disseminated BCG infection if an infant who receive immunosuppressive therapy is found to have an immune deficiency characterized by a mycobacterium infection after BCG vaccination.

Key words : BCG, Disseminated BCG infection, Crohn's disease, Abnormality of NEMO gene

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————— Case Report —————

TUBERCULOSIS OF THE TONGUE INITIALLY SUSPECTED OF
TONGUE CANCER: A CASE REPORT

— Including the Search for Recent 16 Cases in Japan —

Makoto FURUGEN, Hideta NAKAMURA, Yuichiro TAMAKI, Shusaku HARANAGA,
Satomi YARA, Futoshi HIGA, Masao TATEYAMA, and Jiro FUJITA

Abstract A 56-year-old man, having no particular past history, was admitted to our hospital, with a 9-month history of painful ulcerated lesion of the tongue and a 6-month history of productive cough. A physical examination revealed swelling of his cervical lymph nodes, and a chest roentgenogram on admission showed cavities in the both upper lung fields and nodular shadows over the both lung fields. He was initially suspected of having both cancer of the tongue and pulmonary tuberculosis, but finally diagnosed as secondary tuberculosis of the tongue due to sputum smear-positive pulmonary tuberculosis by biopsy of the tongue and sputum examination. He was treated with isoniazid, rifampicin, ethambutol and pyrazinamide, and his pain and ulcerated lesion of the tongue rapidly improved.

Due to our search for recent 16 cases of tuberculosis of the tongue in Japan, we found that the patients of tuberculosis of the tongue were more likely to have concurrently sputum smear-positive pulmonary tuberculosis. In some cases, the

delay in diagnosis was seen. These cases suggest that refractory ulcerated cases of the tongue should be subjected to the biopsy and examination for acid fast bacilli of the tongue with suspicion of tuberculosis of the tongue, and then a chest roentgenogram with suspicion of pulmonary tuberculosis.

Key words: Tuberculosis of the tongue, Secondary tuberculosis, Smear-positive TB, Ulcer of the tongue

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