



HRCT THORACIC MANIFESTATIONS OF SEVERE PULMONARY FORM OF LEPTOSPIROSIS

Radio-Diagnosis

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ABSTRACT

Leptospirosis is a zoonotic disease which is transmitted to humans by contact with soil or water contaminated with urine of rat. Usually patients develop a biphasic illness , however few patients progress to develop the lesser known yet very severe form of leptospirosis known as severe pulmonary form of leptospirosis (SPFL). Clinically patients presents with severe breathlessness and can rapidly deteriorate and therefore require prompt diagnosis and treatment. Here we describe a case series of SPFL and their imaging manifestations to allow radiologists to think of this entity in appropriate clinical settings.

KEYWORDS

Severe Pulmonary leptospirosis, Radiology, Case series.

INTRODUCTION

Leptospirosis is a zoonotic disease which is transmitted to humans by contact with soil or water contaminated with urine of rat. It is endemic in 5 states (Maharashtra, Gujarat, Kerala, Tamil Nadu and Karnataka) in India[1]. Typically patients develop a biphasic illness consisting of acute phase lasting for 1 week followed by immune phase which lasts for another week. Clinically the patient presents with the well known triad of jaundice, impaired renal function and hemorrhage known as Weil's disease. Few of these patients (mechanism not clearly understood) develop the less common and more severe form of disease known as Severe Pulmonary form of Leptospirosis (SPFL). Because of its non classic presentation and lesser occurrence there is delay in correct diagnosis and treatment. Here we describe 3 cases of leptons which developed SPFL with its imaging characteristics on HRCT thorax. This will help radiologist to think of this condition in proper clinical settings and help in providing early diagnosis and treatment of these patients.

Case Series

We retrospectively reviewed medical records, chest radiographs and HRCT thorax of 3 patients of leptospirosis (Leptospira IgM positive or detected on PCR analysis) which were diagnosed and treated between July 2022 to October 2022 (rainy season) at our institution.

The patients included 3 men, age between 20 to 30 years (mean: 26 years).

Most common symptom on presentation was breathlessness. One patient had hemoptysis and another patient had jaundice. None of the patients presented with both hepatic and renal involvement. After the routine investigations patient underwent High-resolution CT using 1- to 2-mm collimation scans at 10-mm intervals through the lungs and these were reviewed.

The high-resolution CT findings in all patients consisted predominately of extensive, bilateral, ground-glass opacities involving all lobes along with areas of consolidation. The abnormalities involved mainly the posterior and basal segments.

Another finding common to all three patients was presence of ill-defined airspace nodules. Follow up HRCT in one patient and radiograph in another patient showed resolution of these air space infiltrates within a span of 10-12 days.

Two of the patients improved and were discharged while one patient died after 5 days of admission.

Figure 1a shows chest radiograph of a patient on day of admission which does not reveal any significant abnormality. Due to worsening of his symptoms a repeat radiograph was performed just 1 day later (Figure 1b) which shows diffuse air space opacities involvement all the zones indicating the rapidity with which this disease can evolve.



Figure 1a

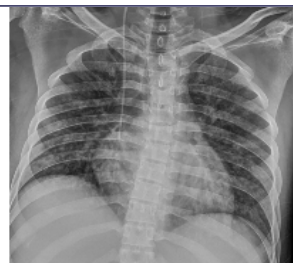


Figure 1b

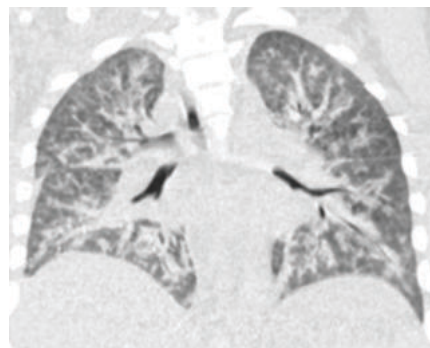


Figure 2 HRCT thorax of the same patient reveals patchy ground glass opacities, ill defined nodules and consolidation which are peribronchovascular in distribution and involving basal segments more, consistent with the findings of pulmonary haemorrhage.

DISCUSSION

Symptomatic pulmonary involvement occurs in 20% to 70% of patients with leptospirosis. Cases are usually mild [2]. The severe pulmonary form of leptospirosis (SPFL) is a lesser known entity and can lead to acute respiratory failure and death when adequate treatment fails.

The predominant imaging abnormality consisted of poorly defined, diffuse, ground-glass opacities. In our series of three patients, all had ground-glass opacities, airspace consolidation and ill-defined nodules [3,4]. These findings are secondary to pulmonary haemorrhage.

It has been postulated that the mechanism for the haemorrhage is direct capillary injury by toxins produced by the organisms. Other factors that may lead to pulmonary haemorrhage in these patients include uraemia, thrombocytopenia, and coagulopathy[5].

Although ground glass opacities and consolidation were caused by diffuse haemorrhage in our study, these findings are nonspecific. The

differential diagnosis needs to include cardiogenic and non-cardiogenic pulmonary oedema and pneumonia.

Follow up radiographs or HRCT thorax shows resolution of pulmonary infiltrates with no long term sequelae.

Closest differential is ARDS and the distinction between the two can be made on follow up imaging where in Acute Respiratory Distress Syndrome (ARDS) takes much longer time to clear completely as compared to pulmonary haemorrhage.

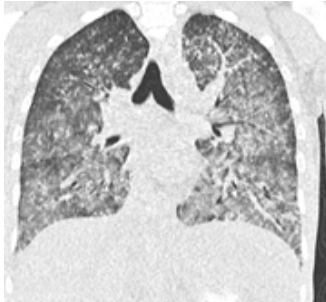


Figure 3: coronal section of one patient showing bilateral and diffuse ground glassing and consolidation with more involvement of the basal segments.

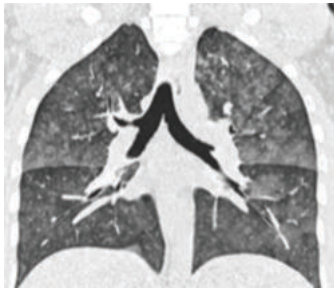


Figure 4: Repeat imaging in the same patient 6 days later revealed marked clearly of the lung fields with decreased attenuation of ground glassing and no evidence of consolidation as compared to previous scan.

CONCLUSION

Severe pulmonary form of leptospirosis is a less common and severe manifestation of leptospirosis which clinically poses a diagnostic dilemma. Imaging in such cases can help in providing a clue to diagnosis specially in appropriate clinical settings and ensures timely diagnosis and treatment. Closest differential is Acute Respiratory Distress Syndrome (ARDS) and distinction between two can be made on follow up imaging wherein ARDS takes much longer time to clear than pulmonary hemorrhage.

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