



## Analysis of Radiological Manifestations of Pulmonary Infections in Renal Transplant Recipients

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ABSTRACT

**Background :** Pulmonary infection remains as an important source of morbidity and mortality in renal transplant recipients. In most of the cases, clinical findings are atypical and nonspecific. Cultures are expensive and time-consuming. Hence imaging plays an important role in establishing the diagnosis, Differential diagnosis, treatment and follow up of pulmonary infections in renal transplant recipients. **Aim:** To estimate the radiologic manifestations of pulmonary infection in renal transplant recipients. **Methods and Material:** This study was a prospective study of 29 adult renal transplant recipients who had developed pulmonary infection during the period of 2 years. The chest x-ray and High resolution computer tomography (HRCT) chest examinations were done and interpreted by two radiologists independently. **Results:** 29 renal transplant patients reported with respiratory symptoms were admitted for inpatient care. 23 patients were male and 6 were females. The age range was 18 years to 53 years of age and the mean age of the patients was 31.8 years. Of the 29 patients, 27 reported once, 1 reported twice and another thrice. A total of 32 episodes of respiratory infection were studied. On analyzing radiological manifestations of pulmonary infection, 23 (71.87% ) patients had presented as air space opacities / consolidation, 4 ( 12.4% ) patients had presented as pleural effusion, 1 patient (3.1%) each of miliary nodules and Fibro cavity and was normal in 2 ( 6.2% ) patients. **Conclusion:** In conclusion, renal transplantation is associated with a high risk of respiratory infections, which may result in morbidity and mortality of renal transplant recipients. Correlating the radiologic manifestations with clinical symptoms can hasten the diagnosis and appropriate therapy.

### KEYWORDS

Post renal, HRCT, pulmonary infection, Transplant recipients

### Introduction:

Pulmonary infections are a common cause of morbidity and mortality in immunocompromised renal transplant patients. They represent 10 to 20% of the total number of infections and account for about 50% of mortality in post renal transplant patients (1–3). Initially Plain films are used. However, they have a limited role in differentiating the causative factors. HRCT is used as a solution tool in patients with unclear plain film findings and/or no response to treatment. The main advantage of HRCT is a very detailed characterization of the lung parenchyma. Even though HRCT findings are not always specific, there are several things that are more common in certain types of pneumonia. The aim of the article is to analyze the radiological manifestations of pulmonary infections which may suggest the particular causative microorganism and show how they can narrow the differential diagnosis when coupled with clinical data. HRCT chest is helpful in characterizing lung infiltrates and air space opacities. Various methods have been used as the diagnostic procedures to identify the microorganisms. These include sputum analysis, serology, blood culture, gastric aspiration (for the analysis of tuberculosis), radiology (x ray, high resolution computerized tomography), fiberoptic bronchoscopy (BAL, mucosal brushing), transtracheal aspiration. Each method has its own advantages and shortcomings. Other clinical protocols like bronchoalveolar lavage, transbronchial biopsy, or open lung biopsy were available to establish the diagnosis of pulmonary infection [4 - 6] but these procedures besides being invasive, fail to provide specific diagnosis in 30 to 60% of patients [7, 8].

**Subjects and Methods:** In this prospective study 29 adult post renal transplant patients who had developed pulmonary infection were included. All patients had taken chest radiographs and chest CT scans. 23 patients were male and 6 were females. The age range was 18 years to 53 years of age and the mean age of the patients was 31.8 years. Our chest radiography findings were coincided with HRCT findings. 29 renal

transplant patients reported with respiratory symptoms were admitted for inpatient care. Of the 29 patients, 27 reported once, 1 reported twice and another thrice. A total of 32 episodes of respiratory infection were studied.

**Results:** The spectrum of pulmonary infections included were Bacterial infections in 16(50%) patients, pulmonary tuberculosis (TB) in 9(28.12%) patients, Candida in 2(6.24%) patients, pulmonary aspergillosis, and Pneumocystis jiroveci pneumonia (PJP), in 1(3.12%) patient each. No definite infection was made out in 3 cases. On analysis of spectrum of microbes in relation to radiographic findings, following observations were made. On analyzing radiological manifestations of pulmonary infection, air space opacities/consolidation was the most common presentation seen in 23 (71.87%) patients. 4 (12.4%) patients had presented as pleural effusion, 1 patient (3.1%) each of miliary nodules and Fibro cavity and Chest x ray was normal in 2 ( 6.2% ) patients.

**Discussion:** Pulmonary infection is the chief cause of death in the immunocompromised host of renal transplantation, and is associated with high morbidity and mortality. Rapid and accurate diagnosis of pulmonary infection is important, not only because of the high morbidity and mortality associated with infection but also because of the frequent complications associated with the drugs used to treat the infection (9). The chest radiograph and HRCT chest are the important diagnostic tools to analyze the manifestations of the abnormality and the degree of progression which can help in the diagnosis of pulmonary infections in renal transplant recipients. However, imaging alone is seldom adequate, because its manifestations are seldom specific for the detection of a particular pathogen. It is vital to encapsulate the clinical characteristics and radiologic findings of the different pathogens in pulmonary infection after renal transplantation. In our study, bacterial infection was the most common infection and it presented as consolidation/air space opacities. The second most common infection was

Mycobacterium Tuberculosis infection and it was manifested as pleural effusion. This high frequency of TB, which is uncommon in the Western literature, is attributed to the high overall prevalence of TB in the general population of India. Similar observations have been reported in other studies from our country [10, 11, 12].

**Conclusion:** HRCT chest can provide essential information and suggest the differential diagnosis in a significant proportion of renal transplant recipients with pulmonary infection. Practice of a chest CT-scan should be considered in renal transplant recipients exhibiting respiratory symptoms such as cough and recurrent respiratory tract infections. Thus, it may be possible to narrow the differential diagnosis and introduce empirical treatment, even before the diagnosis is confirmed by microbiology.

**Radiological Manifestations at presentation**

Radiological Features	N-32(%)
Air space opacities/Consolidation	23(71.87)
Pleural effusion	4(12.4)
Nodules	1(3.1)
Fibrocavity	1(3.1)
Miliary	1(3.1)
Normal	2(6.2)
TOTAL	32(100)

**Spectrum of Respiratory infections in Relation to Radiographic Findings**

	Air space opacities/Consolidation	Pleural effusion	Nodules	Fibro cavity	Miliary	Normal	TOTAL
Bacterial Infection	12	3	1	-	-	-	16(50%)
Mycobacterium Tuberculosis	6	-	-	1	1	1	9(28.12%)
Aspergillus	1	-	-	-	-	-	1(3.12%)
Candida	2	-	-	-	-	-	2(6.24%)
PJP	1	-	-	-	-	-	1(3.12%)
No definite diagnosis	1	1	-	-	-	1	3(9.4%)
TOTAL	23	4	1	1	1	2	32(100%)

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