High Resolution Computed Tomography (HRCT) In Diagnosis And Management Of Usual Interstitial Pneumonia

Dr. Amar Suri*, Dr. Dharita Shah**

*Radiology Resident 3rd year, **Professor , N.H.L. Municipal Medical College

Abstracts: **Background & Objectives:** The aim of our article is to explain utility of high resolution CT scan in detection of usual interstitial pneumonia which has grave prognosis .**Materials & Methods**: Study opulation comprises 19 women and 11 men. Inclusion criteria were patients presenting with breathlessness, reticular patternon chest xray or restrictive pattern on pulmonary function tests. All patients were subjected to high resolution computed tomography (HRCT) examination. Findings of HRCT & chest x-ray were compared. **Results**: Study showed that (1)Septal thickening with honeycombing is core finding in UIP.(2)Lower lobe involvement, sub pleural & peripheral distribution of lesions were characteristic.(3)Ground glass opacity & traction bronchiectasis were other findings. **Conclusion**: In conclusion, HRCT is having high degree of accuracy in diagnosing usual interstitial pneumonia. The disease itself is having worst prognosis. Early detection is possible with HRCT, in late stages changes can be picked up easily without need of lung biopsy.[Suri A NJIRM 2014; 5(1) : 61-63]

Key Words: Usual Interstitial Pneumonia, Septal Thickening, Honey Combing

Author for correspondence: Dr. Amar Suri, Radiology Resident 3rd Year, N.H.L.Municipal Medical College, Ahmedabad.Emailcontact:dramarsuri16@gmail.com

Introduction: A UIP falls under category of idiopathic interstitial pneumonia, commonest pattern of idiopathic interstitial pneumonias[1]. UIP is essentially is a pattern, which may be associated with variety of etiologies, but when no appropriate etiology is found, it is termed as idiopathic pulmonary fibrosis. Other causes of UIP-type pattern include chronic hypersensitivity pneumonitis, asbestosis, connective tissue disorders & rarely drugs. The pathological hallmark is fibroblastic focus which is characterized by immature pulmonary interstitium surrounded by fibrosis[2].Patients usually present with breathlessness, chest x-rays in early stage are usually normal. As disease advances, progressive development of reticular pattern is seen. With architectural distortion reduction in lung volumes is seen typically. Typical HRCT findings include presence of honeycombing, with intra as well as interlobular septal thickening, traction bronchiectasis, reduction in lung volumes & ground glass opacity on occcasions[3].

The CT differential diagnosis includes:
1) Fibrotic NSIP,
2) Pulmonary fibrosis related to connective tissue disorders
3) Asbestosis, hypersensitivity pneumonitis & drug toxicity.

Fibrotic NSIP & UIP are differentiated accurately on biopsy only. The most useful finding for differentiating NSIP from UIP is the greater extent of honeycombing in cases of UIP. Asbestosis can be differentiated by presence of pleural plaques. Chronic hypersensitivity pneumonitis can be differentiated by the presence of centrilobular nodules, air trapping & relative sparing of lung bases.

Materials & Methods: Inclusion criteria were patients presenting with breathlessness, reticular pattern on chest x-ray or restrictive pattern on pulmonary function.

The study included 19 females and 11 males with UIP. All patients were between 38-75yrs of age group. 50 years was mean age for UIP, for both males and females.

Scan Protocol: Scans were performed on Somatom Sensation 64 slice CT scanner with following protocol:

- 0.6 mm contiguous computed tomographic sections of chest were taken from the superior mediastinum to the cardiophrenic recesses.(supine position of patient).
- 120 kVp & 200 mAs with pitch of 1.4 used in scanning technique**.**

Diagnostic criteria:

1) Presence of intra & interlobular septal thickening with architectural distortion & loss of lung volume.

2) Honeycombing is a core feature of UIP, which is associated with advanced stage of disease.
3) Traction bronchiectasis.
4) Ground glass opacity (GGO)(seen in some cases).

Findings were seen predominantly in lower lobes & sub pleural region with apico basal gradient.

Results: Our study included 30 patients- 11 men and 19 women with average age of 50 years (38-75 years),as per inclusion criteria. Findings are as mentioned below:

1) Intra & interlobular septal thickening , honeycombing & traction bronchiectasis are most common findings in these patients.
2) Lower lobe involvement, sub pleural & peripheral distribution of lesions were characteristic.
3) Ground glass opacity was found in half of patients.

Breathlessness is predominant symptom in all patients(100%).Chest radiographs were showing reticular pattern(figure 1) in 24 patients(80%).Peripheral & sub pleural distribution is seen in all patients(100%).Intra & interlobular septal thickening is seen in all patients(100%),honeycombing (figure 2)with loss of lung volume seen is seen in 27 patients(90%),traction bronchiectasis is seen in 27 patients(90%),ground glass opacity is seen in 15 (50%)patients.

Discussion : Interstitial pneumonias are entities which are diagnosed by clinopathoradiological correlation. But in cases of UIP, accurate diagnosis is possible with radiological findings in appropriate clinical background. Lung biopsy is the diagnostic in confusing cases .Clinical features are dyspnoea ,restrictive pattern on pulmonary function tests ,including decrease diffusing capacity for carbon monoxide, abnormal[A-a]O2 on rest or with exertion[4,5,6].Patients present with progressively worsening dyspnoea & non productive cough. Usually patients present with complaints of breathlessness & non productive cough, treatment with variety of dugs & even steroids ineffective especially when UIP pattern is representative of idiopathic pulmonary fibrosis is seen[7, 8,9,10].

HRCT reduces need of biopsy to stamp diagnosis of UIP. Pathology is helpful in doubtful cases, late in the course of the illness & after commencement of treatment[11].

Figure I: chest x-ray showing reticular patter in bilateral basal lung fields.

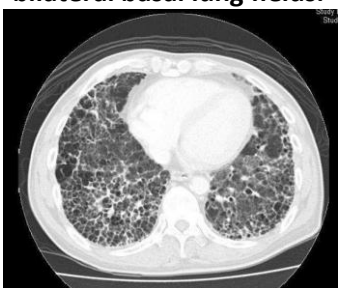
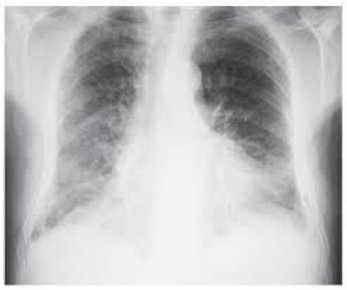


Figure II: HRCT showing intra & interlobular septal thickening with Honeycombing. Honeycombing is core feature of UIP.



At histological examination, two important findings are stressed upon:

1) Fibroblastic focus-which is immature pulmonary interstitium surrounded by fibrosis, recognized as a key early of UIP.
2) Temporal heterogeneity: the identification of fibroblastic lesions of different stages (fibroblastic foci, mature fibrosis & honeycombing) encountered[12].

Typical HRCT findings allowing confident diagnosis are intra & interlobular septal thickening, architectural distortion, associated traction bronchiectasis, honeycombing in basal peripheral & sub pleural distribution. In particular honeycombing is a core finding which facilitates distinction of UIP from other interstitial pneumonias. HRCT has been shown to be a highly accurate tool for diagnosis of UIP, with a positive predictive value of 95-100% [3].

GGO are representative of many processes on HRCT.In cases of UIP it represents immature

fibrosis/active disease/exacerbation which in later stage develop as intra & inter lobular septal thickening[13]. When fibrosis is encountered with GGO, it is suggestive of irreversible disease. GGO has favorable prognosis than reticulation on treatment [13]. Ends stage lung disease was noted in 90% population of our study- with predominant finding of honeycombing & loss of lung volume (90%).

Conclusion: HRCT findings in advance stage of UIP are virtually diagnostic & biopsy can be avoided. Early stage of disease can be picked up with HRCT findings, which is helpful in diagnosis of this disease. Disease is having bad prognosis & poor survival, so precise diagnosis is necessary for which HRCT is very helpful. Being non invasive tool its utility increases over biopsy for diagnosis of UIP.

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