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Role of MDCT in The Evaluation of Smoking-Related Lung Diseases

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Abstract

Background: Chronic smoking is a major risk factor for chronic obstructive pulmonary disease (COPD), interstitial lung diseases (ILDs), and lung malignancies. MDCT with HRCT technique plays a key role in detecting and characterizing these conditions.

Aim: To evaluate the role of MDCT in assessing smoking-related lung diseases.

Materials and Methods: A hospital-based observational study was conducted among 100 chronic smokers. HRCT images were evaluated for airway and parenchymal abnormalities.

Results & Discussion: Centrilobular lucencies (43%), bronchial wall thickening (34%), and hyperinflation (27%) were the most common findings. COPD was diagnosed in 49% of cases, while ILDs and suspicious neoplastic lesions were identified in the remaining patients.

Conclusion: MDCT is a sensitive imaging modality for detecting and characterizing smoking-related lung diseases.

Keywords: MDCT; HRCT; Smoking; COPD; Interstitial lung disease

Introduction

Smoking remains one of the leading causes of preventable morbidity and mortality worldwide. It is directly associated with COPD, ILDs, and lung malignancies. Conventional chest radiography has limited sensitivity for early and subtle parenchymal changes.

MDCT, particularly HRCT, provides high-resolution images of lung parenchyma and airways. It allows early

detection, accurate disease characterization, and assessment of disease severity.

Materials And Methods

Study Type - Prospective observational study

Study Period – 1 year

Sample Size – 100

Study Population – 100 chronic smokers between age of 18-70 years with complaints of progressive dyspnea and persistent cough presenting to OPD and casualty of MGM Hospital, Kamothe, Navi Mumbai.

Inclusion Criteria

- Patients between 18 to 70 years of age of either sex.
- History of chronic smoking.
- Clinical suspicion of lung disease.
- Patients referred for HRCT.

Exclusion Criteria

- Patients below the age of 18 years.
- Pregnant women.
- Known non-smoking related lung disease.

Materials

- Patients were evaluated using Fujifilm 128 slice MDCT Scanner and analysed for various pathological patterns associated with smoking related lung diseases.

HRCT scans were performed following standard protocols. Images were evaluated for emphysematous changes, airway thickening, fibrotic patterns, and mass lesions. Data was recorded in a structured proforma and analysed using descriptive statistics; sensitivity, specificity and predictive values were calculated with a significance level of $p < 0.05$.

Results

Table 1: Distribution of Hrct Findings

Centrilobular lucencies	43
Bronchial wall thickening	34
Hyperinflation	27
Interlobular septal thickening	26
Centrilobular nodules	23
Blebs and bullae	22
Fibrosis	19
Honeycombing	17

Figure 1: HRCT showing centrilobular emphysema in a chronic smoker

Figure 2: HRCT demonstrating bronchial wall thickening

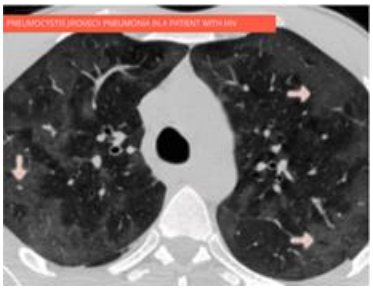

Figure 3: HRCT showing ground-glass opacities in smoking-related ILD

Figure 4: HRCT demonstrating honeycombing suggestive of fibrotic changes

Graph 1:

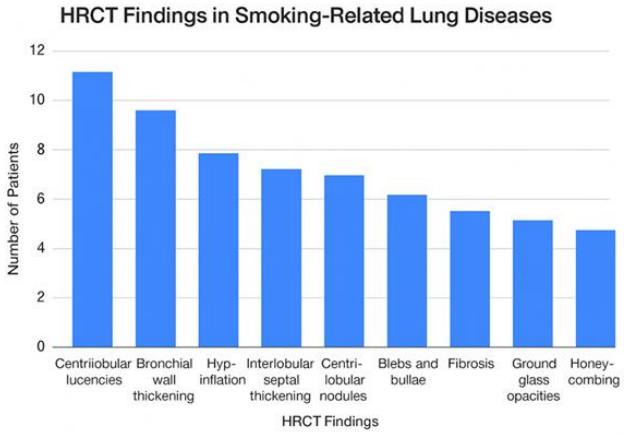

Table 2: Final Diagnosis Based On Hrct Finding:

Diagnosis	Percentage (%)
COPD	49
RB-ILD	12
UIP/IPF	13
DIP	5
LCH	6
Suspicious neoplastic lesions	15

COPD was the most common diagnosis followed by interstitial lung diseases and neoplastic-suspicious lesions.

Figure 5: HRCT image showing respiratory bronchiolitis–interstitial lung disease (RB-ILD)

Figure 6: HRCT features of desquamative interstitial pneumonia (DIP)

Figure 7: HRCT pattern of usual interstitial pneumonia (UIP)

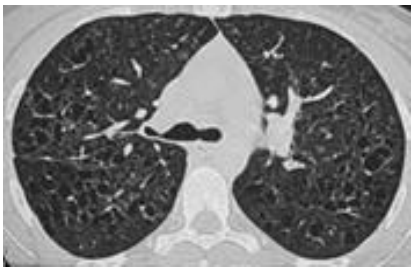

Figure 8: HRCT appearance of pulmonary Langerhans cell histiocytosis (LCH)

Discussion

This study demonstrates the significant role of MDCT in detecting and characterizing smoking-related lung diseases. The high prevalence of emphysematous and airway changes underscores the harmful effects of chronic smoking on lung structure. HRCT enabled accurate distinction among different ILD patterns, which is essential for prognosis and management.

The detection of suspicious lung masses and nodules highlights the importance of MDCT in early recognition of potential malignancy in high-risk populations. Limitations of the study include the lack of histopathological confirmation in all cases and the absence of pulmonary function test correlation.

Conclusion

MDCT is a reliable and sensitive imaging technique for evaluation of smoking-related lung diseases and should be considered a first-line investigation in chronic smokers with respiratory complaints.

References

1. Remy-Jardin M, Remy J. Diagnosis of emphysema with computed tomography. Radiology.
2. Sverzellati N, Lynch DA. Smoking-related interstitial lung diseases. Eur Radiol.
3. Hogg JC, Timens W. The pathology of COPD. Annu Rev Pathol.
4. Webb WR, Müller NL, Naidich DP. High-resolution CT of the lung. Radiology.
5. Travis WD, et al. ATS/ERS classification of interstitial pneumonias. Am J Respir Crit Care Med.