IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 21, Issue 8 Ser.2 (August. 2022), PP 08-12
www.iosrjournals.org

A Study on HRCT Pattern in Follow UP Cases of Covid 19 Pneumonitis.

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Abstract:
The disease was spreading at an alarming speed. In D.Y. Patil Nerul, the first case was discovered in our hospital in the month of March 2020. It amassed intense attention globally due to uncontrolled spread and deaths worldwide.
COVID 19 pneumonia infection primarily affects the lung showing typical HRCT changes - ground glass opacities (Most common feature) which are multi-focal and centrilobular, peripheral and subpleural in distribution with associated airspace consolidation, vascular dilatation, fibrotic changes in the form of traction bronchiectasis, fibrosis and crazy paving pattern.
There is variable HRCT pattern in resolution / absorptive stage of COVID 19 pneumonitis. These changes range from complete resolution in the form of normal appearance of the lung parenchyma to variable level of fibrosis and post infection de-novo interstitial lung disease pattern.
Advanced-phase disease is associated with a increased frequency of: Fibrotic streaks, architectural distortion, subsegmental atelectasis, cicatricial and bronchiectatic changes and mosaic attenuation changes on HRCT.
The follow-up CT, was assessed for the severity and progression of COVID 19 pneumonia. Correlations among particular age group and imaging findings in the HRCT thorax, was done with appropriate analysis technique.
Depending on extent of residual fibrosis, prognosis and the disease progression can be assessed.
Herein the authors quantify HRCT changes in a follow up case of COVID-19 infection and to determine the extent of disease on lungs post COVID with respect to the particular age group.
Long term prognosis of post COVID 19 pneumonitis is dependent on extent of residual fibrosis which can be assessed on follow up HRCT Thorax study.

Date of Submission: 25-07-2022 Date of Acceptance: 08-08-2022

I. INTRODUCTION

•The SARS-CoV-2 belongs to the family of viruses-Coronaviridae, which cause diseases ranging from the common influenza to severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS).
•As of September 2021, cases of COVID 19 have been found in more than 210 countries, with about 191 million confirmed cases, 4 million deaths and 174 million recoveries worldwide.
•HRCT chest plays an important role in diagnosing and to follow-up of patients with patients suffering from COVID-19 pneumonia.
•However, there is paucity of knowledge in the long-term HRCT chest changes after COVID-19 infection.
•This study aims to assess and quantify HRCT changes in a follow up case of COVID-19 infection and to determine the extent of disease on lungs in a post COVID 19 patient of a particular age group.

II. AIMS AND OBJECTIVES

•To assess and quantify HRCT changes in a follow up case of COVID-19 infection and to determine the extent of disease on lungs in a post COVID patient of a particular age group.

III. METHODOLOGY

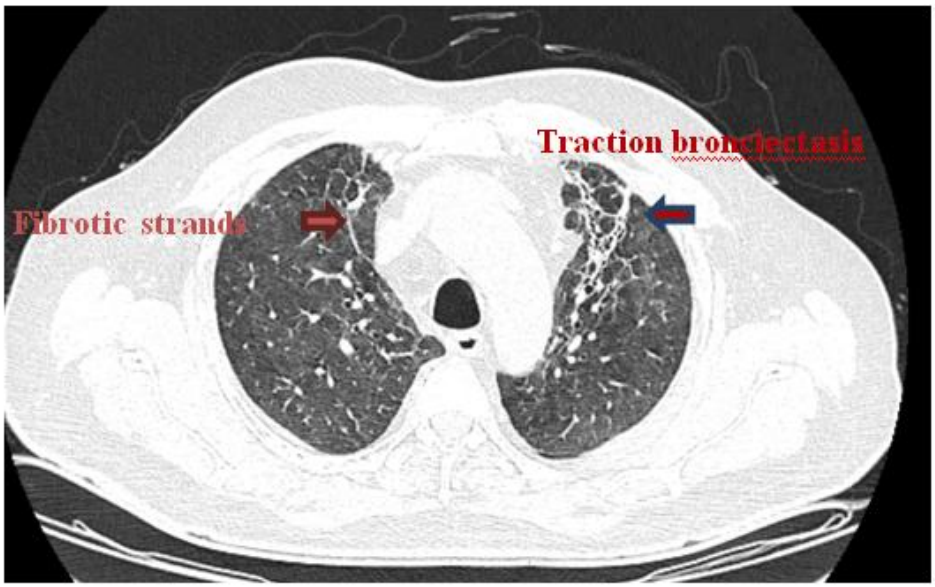
•From March 2020 to September 2021, the follow up HRCT thorax scans were obtained in a post-COVID positive patient.
•Participants were divided on the basis of their follow-up CT scan findings:
i. those with CT evidence of fibrotic-like changes (traction bronchiectasis, parenchymal bands, and/or honeycombing),
ii. those with residual ground glass opacities,
iii. those with mosaic attenuation pattern changes].
These findings were later correlated with age group.

HRCT Image Acquisition and Interpretation
HRCT Scan of thorax was done with thin axial sections with the following CT scanner: GE OPTIMA 128 slice, from the thoracic inlet to the diaphragm.
All 99 patients got a follow-up HRCT chest scan done using the same scanner.
The CT images were reported in by two senior consultant radiologists (Dr. Sarfaraz Shaikh and Dr. Pratik Patil). These consultants observed, interpreted and reported CT features using axial and multiplanar reconstructed images.

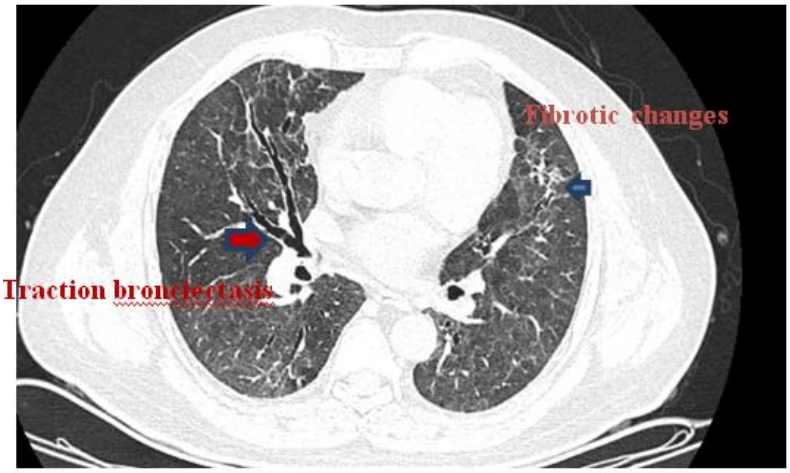
Predominant HRCT COVID patterns include: ground-glass opacities (GGO), airspace consolidation, pleural thickening, pleural effusion, presence of nodules or masses, reticulation, honeycombing, bronchiectasis, and interlobar pleural retraction toward the lesions. Fibrotic-like changes on HRCT is defined as the presence of fibrotic parenchymal bands, honeycombing and traction bronchiectasis.

CASES-
CASE 1:

- Previous history of COVID, with chief complains of shortness of breath.
- HRCT findings were as follows.



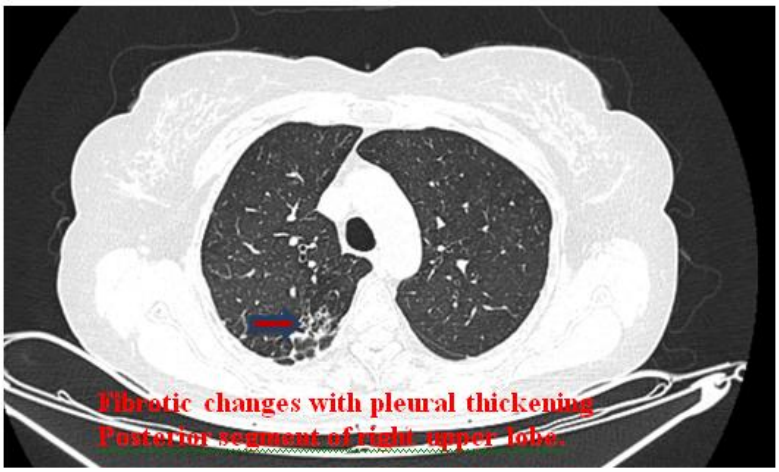
Multiple fibrotic and traction bronchiectatic changes involving the bilateral upper lobes.



Patchy areas of mosaic attenuation involving bilateral lung fields.

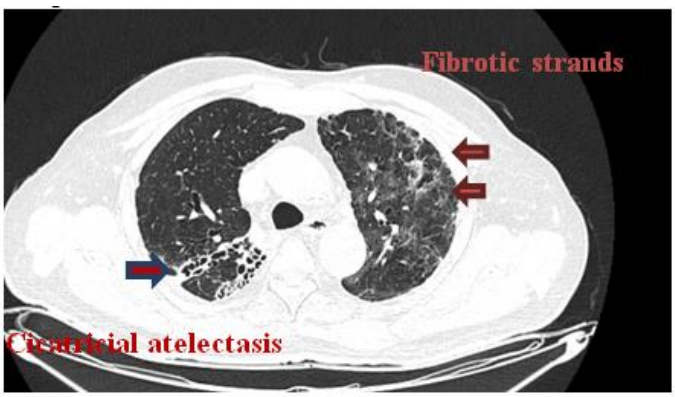
CASE 2:

- Post COVID status.
- Chief complains of mild breathlessness.
- HRCT findings were as follows

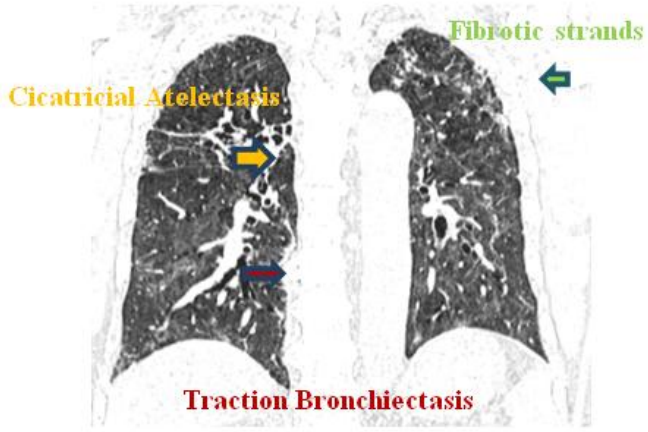


CASE 3:

- Post COVID-19 status.
- Came with complains of breathlessness.
- Patient came for follow up scan.



Cicatricial atelectasis with cystic and varicoid bronchiectatic changes are seen involving posterior segment of right upper lobe.

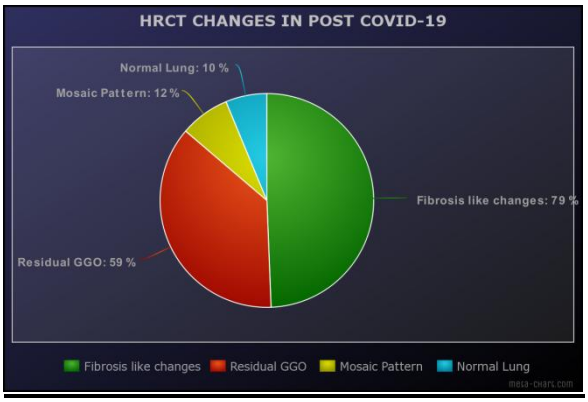


Multifocal bilateral patchy areas of residual ground glass opacities associated with fibrotic changes scattered in bilateral lung parenchyma in centrilobular and peripheral distribution.

IV. Results

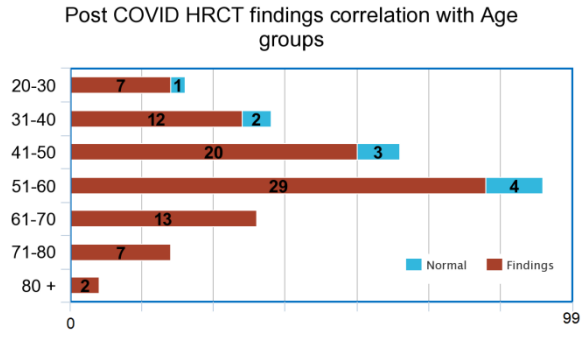
On follow up HRCT thorax following was observed

- **Fibrotic-like changes** was seen in 79 of the 99 participants **(80 %),**
- **Residual ground-glass opacification / residual consolidation** was seen in 59 of the 99 participants **(62 %),**
- **Mosaic attenuation pattern** was seen in 12 out of 99 participants **(13.6 %),**
- **Complete radiologic resolution** was seen in **10** out of 99 participants.



In a sample size of 99 patients. Post covid HRCT sequalae was observed in the following age groups-

- 20-30: 7/8 patients.
- 31-40: 12/14 patients.
- 41-50: 20/23 patients
- 51-60: 29/33 patients
- 61-70: 13/13 patients.
- 71-80: 7/7 patients.
- 80 + : 2/2 patients.



V. Conclusion

• Follow-up HRCT in patients who suffered from COVID-19 pneumonia predominantly showed fibrotic-like changes in the lung parenchyma in more than 80 % of the patients, followed by residual ground glass opacities / residual consolidation in 62 % of patients.

• Patients belonging the age group 51-60, 41-50 and 61-70 were most susceptible to these HRCT findings. Monitoring of these patients with follow up HRCT study with appropriate anti-fibrotics can be advised in this age group.

References

[1]. Ullah, H., et al. "Novel Coronavirus 2019 (COVID-19) Pandemic Outbreak: A Comprehensive Review of the Current Literature." Vacunas, no. 2, Elsevier BV, May 2021, pp. 106–13. Crossref, doi:10.1016/j.vacun.2020.09.009.

[2]. Han, Xiaoyu, Yanqing Fan, OsamahAlwalid, Na Li, Xi Jia, Mei Yuan, Yumin Li, et al. "Six-Month Follow-up Chest CT Findings after Severe Covid-19 Pneumonia." Radiology 299, no. 1 (January 26, 2021): E178–E185. https://doi.org/10.1148/radiol.2021203153.

[3]. Han X, Fan Y, Alwalid O, Li N, Jia X, Yuan M, Li Y, Cao Y, Gu J, Wu H, Shi H. Six-month Follow-up Chest CT Findings after Severe COVID-19 Pneumonia. Radiology. 2021 Apr;299(1):E177-E186. doi: 10.1148/radiol.2021203153. Epub 2021 Jan 26. PMID: 33497317; PMCID: PMC7841877.

[4]. Solomon, Joshua J., et al. "CT of Post-Acute Lung Complications of COVID-19." Radiology, Radiological Society of North America (RSNA), Aug. 2021, p. 211396. Crossref, doi:10.1148/radiol.2021211396.

Dr.Shravan S Patil, et. al. "A Study on HRCT Pattern in Follow UP Cases of Covid 19 Pneumonitis." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, 21(08), 2022, pp. 08-12.