

EDITORIAL

HIGH RESOLUTION CT CHEST (HRCT)

As a radiologist, I want to highlight a few facts about HRCT chest. Generally the referring physicians have some confusion about the examination. At times we get referrals of HRCT chest of patients who have focal lung lesions, or we get referrals of HRCT chest with contrast, or HRCT chest is advised by clinicians for pulmonary embolism. So I would like to highlight a few facts about chest CT, particularly HRCT chest.

What is HRCT

HRCT is high resolution CT scanning. In this technique, high resolution images are acquired through lung parenchyma. The sections taken through lung parenchyma are thin, 0.6-2mm in thickness and are combined with high spatial frequency reconstruction algorithm¹. The technique is used to see diffuse lung diseases. Diffuse lung diseases include interstitial lung disease, cystic lung disease, small airways disease, pulmonary micronodules and bronchiectasis. The images produced are specific for lung and the details of mediastinum is not seen². As HRCT chest takes thin sections of the patient at interval of 10-40 mm, focal lung lesions are likely to be missed in the gaps between the sections³. With modern scanners, contiguous sections may be taken which give a very high radiation dose to the patient. Hence, HRCT chest should not be advised injudiciously.

The examination of HRCT chest is done without contrast. The lung parenchyma is traceable to the lung periphery and secondary pulmonary lobules are seen. In cases of interstitial lung disease, the site and pattern of involvement usually leads us to correct diagnosis, as for example, if the disease is sited at lung bases with honeycombing, this case is almost 100% specific for idiopathic interstitial fibrosis. Interstitial pattern of disease is recognizable in its initial stages and treatable causes of this disease can be reversed. Similarly, areas of air trapping on HRCT can point towards a diagnosis of

obliterative bronchiolitis/emphysema and coupled with expiratory scan can accurately make the diagnosis.

The mediastinum, however, is not clearly seen on HRCT chest, so if the clinician desires to see mediastinal pathology, CT chest with IV contrast is the modality of choice. Nodular pulmonary disease with varying patterns can be assessed with HRCT chest. The 3 patterns of nodules which include centrilobular, perilymphatic and random nodules can be distinguished and in this way different diseases can be recognized⁴. Centrilobular pattern of disease has the nodules in the center of the secondary pulmonary lobule and the nodules spare the peripheral 1cm of lung parenchyma. Certain diseases as endobronchial tuberculosis have this pattern of disease on HRCT. Perilymphatic spread occurs along bronchovascular bundles and fissures and certain diseases as lymphangitis carcinomatosa and sarcoidosis have this pattern of spread. So by looking at the pattern of distribution and characteristic HRCT features of diseases, a fair degree of accuracy in diagnosis is achieved with HRCT. I would summarize that HRCT chest should not be advised injudiciously and should be reserved for the following conditions:

- Diffuse lung parenchymal disease predominantly interstitial lung disease
- For focal lung lesions and mediastinal lesions, CT chest with contrast should be advised

REFERENCES

1. ACR-STR Practice Parameter for the Performance of High-Resolution Computed Tomography (HRCT) of the Lungs in Adults. Am Coll Radiol 2015. Retrieved 27 June 2017.
2. Khan AN, Hanley S, Macdonald S, Chandramohan M, Ghanem SA, Irion KL (6 January 2017). "Imaging in Bronchiolitis Obliterans Organizing Pneumonia: Overview, Radiography, Computed Tomography". Medscape. Web MD. Retrieved 29 June 2017.

3. Worthy S. High resolution computed tomography of the lung BMJ 1995; 310(6980): 615-6.
4. Hansell D. Imaging of diseases of the chest. fourth edition Philadelphia: Elsevier Mosby; 2005; P143-173.

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