

Research paper 3

Comparison of dynamic perfusion CT parameters of biopsy proven benign and malignant lung lesions at a tertiary care centre

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Introduction and objectives: At present non-contrast CT(NCCT) is the initial modality of choice for diagnosis in patients with suspicious lung lesions and requires confirmation by biopsy. It is invasive and requires high expertise. Dynamic perfusion CT (dVPCT) may be used as a non-invasive diagnostic modality to differentiate benign lesions from malignant lesions. The objective of this study was to compare various dvPCT parameters of biopsy-proven benign and malignant lung lesions.

Methodology: Ten patients with suspicious lung masses/nodules underwent a routine NCCT chest, followed by dvPCT on a 384-row multi-slice CT scanner system after injecting 50 ml Iohexol 300mg/ml. A subsequent tru cut biopsy was performed and the perfusion parameters of benign and malignant lesions were compared.

Results: The mean age was 58 ± 10.87 years. All patients underwent biopsy to confirm the diagnosis; five were diagnosed with lung carcinoma, four were diagnosed to have a non-malignant lesion, one report was non- confirmatory, and this patient was excluded from the study. Dynamic perfusion parameters were compared between benign and malignant groups. Measurements of blood flow (malignant: 53.29 ± 18.43 ml/dl/min; benign: 9.94 ± 7.1 ml/dl/min, $p=0.032$) and flow extraction product (malignant: 12.18 ± 1.9 ml/dl/min; benign: 3.86 ± 3.7 ml/dl/min, $p= 0.035$) revealed a statistically significant difference between the two groups. Measurements of blood volume did not reveal a statistically significant difference between the groups (malignant: 5.222 ± 1.11 ml/dl; benign: 1.61 ± 1.5 ml/dl, $p > 0.05$).

Conclusion: A statistically significant difference in blood flow and flow extraction product was found between the benign and malignant groups. Blood volume did not show a statistically significant difference between the groups. The findings suggest that dVPCT can be added to routine NCCT to facilitate diagnosis. However since, this is a preliminary pilot study, further prospective multicentric studies are required to determine the usefulness of dVPCT in the diagnosis of lung lesions.

Keywords: lung, malignant, benign, biopsy

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