

ID: 175

Scientific Abstract

Topics: Neuroradiology

Keywords: Parathyroid adenoma, 4D CT, 4D MRI

Comparison of 4D-CT and 4D-MRI in the Detection of Parathyroid Lesions in Primary Hyperparathyroidism: Can 4D MRI be a suitable alternative to 4D-CT?

Devasenathipathy Kandasamy, Narasiman Murugan, Raju Sharma, Ankur Goyal, Nikhil Tandon, Nandita Gupta, Seenu V, Nishikant Damle, Shipra Agrawal

All India Institute of Medical Sciences, New Delhi, India

Objective:

The aim of this study was to compare 4D-CT and 4D-MRI in the detection and localization of parathyroid lesions in patients with primary hyperparathyroidism (PHPT).

Materials & Methods:

In this ethically approved study, 170 patients (18-77 years) with suspected PHPT were recruited (May,2016-Feb,2019). Children & pregnant women were excluded from the study. 4D-CT was performed in 3 phases (NCCT, arterial and venous) on 256-slice scanner and 4D-MRI was performed on 1.5T scanner. On 4D-MRI, T1W, T2W (fat suppressed and non-fat suppressed), Diffusion Weighted, post contrast dynamic T1W sequences and delayed scans were performed. 131 out of 170 patients (130,4D-CT, 59,4D-MRI) underwent surgery and only those were included for analysis. Surgical findings confirmed on histopathology and normalization of PTH levels were taken as gold standard. Studies were analyzed for the presence and quadrant wise location of parathyroid lesions by two experienced radiologists by consensus.

Results:

Of 131 proven parathyroid lesions, 119 (90.8%) were adenomas, 10 (7.6%) were hyperplasia and 2 (1.5%) were parathyroid carcinomas. In 129 patients, the lesions were preoperatively localized on imaging accurately. In two patients where both 4D-CT and 4D-MRI were falsely negative, small lesion was found at surgery. The sensitivity of 4D-CT and 4D-MRI for lesion detection and quadrant localization was 99.23%(95%CI-95.79%-99.98%) and 98.28%(95%CI-90.76%-99.96%) respectively.

Conclusion:

4D-CT and 4D-MRI had high accuracy for detection and localization of parathyroid lesion in patients with PHPT. 4D-MRI, being a modality without the hazards of ionizing radiation may provide a robust alternative for the localization of parathyroid lesions.