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MRI Has Improved Detection of Small Neuroendocrine Liver Metastasis Compared with Ga-68 DOTATATE

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BACKGROUND: Ga-68 DOTATATE has gained popularity as an imaging modality for neuroendocrine tumors (NET). It has proven useful in many clinical situations, such as identification of occult primary lesions and distant metastasis. However, for surgical planning, precise localization and understanding of disease burden is essential to determine resectability. MRI is often the preferred imaging modality for evaluation of liver pathology with excellent resolution. Unfortunately, there is a paucity of data comparing Ga-68 DOTATATE and MRI imaging specific to NET liver metastasis.

METHODS: A retrospective analysis was performed on patients with NET liver metastasis that had MRI and DOTATATE completed within 3 months of each other. The studies were anonymized, and two radiologists independently evaluated the studies for the number of liver lesions and their smallest and largest sizes.

RESULTS: We identified 41 patients with NET liver metastasis and recent imaging with both Ga-68 DOTATATE and MRI. The median number of days between the imaging modality was 30 days [interquartile range (IQR) 5-20]. Our cohort was well balanced with 51% males (n=21) and 49% females (n=20) and a median age of 62 (IQR 55-68). Independent review of all imaging by two blinded radiologists showed low inter-rater variability with an intraclass correlation coefficient of 0.98 for MRI and 0.90 for DOTATATE. When excluding cases with extensive liver metastasis (>20 hepatic lesions), we found MRI was superior in detection of hepatic lesion, with a mean of 10.9 lesions with MRI vs 7.1 lesions in DOTATATE (p<0.001). Furthermore, in those patients with multiple lesions, MRI was able to detect significantly smaller lesions than DOTATATE (MRI mean 3.3mm vs DOTATATE mean 9.0mm, p<0.001).

CONCLUSION: Although Ga-68 DOTATATE imaging has significant utility in the diagnosis and surveillance of NET deposits, MRI may be more useful for identification of smaller most subtle lesions for pre-operative planning.

ABSTRACT ID: 200