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Defining MRI Superiority Over CT for Neuroendocrine Liver Metastases

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BACKGROUND: Across the US and world, CT tends to be the easiest and most readily available modality to detect neuroendocrine liver metastases (NLM). A thorough understanding of their size, location, and proximity to vessels is critical in determining resectability and surgical approach. The potential advantages of MRI over CT in preoperatively staging NLM have not been well established.

METHODS: Patients with NLM with both a contrast-enhanced CT and MRI within three months of each other were extracted from our prospectively maintained institutional database. The studies were anonymized, and two radiologists (RADS1 & RADS2) independently evaluated the studies for the number of liver lesions and their smallest and largest sizes. The CTs and MRIs were evaluated separately and in different orders to minimize recall bias.

RESULTS: We identified 45 patients with NLM for whom we had contemporary CT and MRI imaging of the liver. Males (n=23; 51%) and females (n=22; 49%) were equally represented; the median age was 61 [interquartile range (IQR) 55-69]. The median number of days between the studies was 51 (IQR 36-78). Data reliability was excellent with low inter-rater variability (intraclass correlation coefficient 0.932 for CT and 0.954 for MRI). The mean number of lesions seen by both radiologists on MRI was significantly higher than CT (14 vs. 12 lesions; P=0.001). In a subgroup analysis, Eovist®-enhanced MRI detected significantly smaller lesions than CT (RADS1: 4mm vs. 6mm, P=0.001; RADS2: 3mm vs. 5mm; P=0.003) when the studies contained two or more lesions.

CONCLUSION: Our data suggest that more NLM, especially small lesions when

Eovist® is used, are detected on MRI than on CT. Preoperative image modality selection may therefore alter the observed tumor burden landscape and, consequently, surgical planning.

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