Radiologically and pathologically detected vascular invasion in colorectal cancer – A call for MRI liver

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BACKGROUND:
Pathologically and radiologically detected vascular invasion (pVi and rVi) in colorectal cancer (CRC) is a predictor of poorer outcome. Our CRC multidisciplinary team (MDT) consensus was to perform additional non-contrast MRI liver in these patients including when metastases were not present on CT. We assessed a) Predictive values of rVi and pVi on the development of liver metastasis and b) benefit of additional non-contrast MRI liver over the standard of staging CT.

METHODS AND MATERIALS:
This study was a retrospective cross-sectional study. Data were collected as part of a clinical service evaluation and processed through our local audit and governance procedures.

The MDT outcomes between 01/01/16 and 31/12/17 were reviewed to identify all the post-operative CRC patients who had an MRI examination of the liver in this period. During this period, our MDT recommended a liver MRI for patients with vascular invasion even in the absence of liver metastasis on CT. This was in addition to the other standard practice indications for liver MRI such as patients with indeterminate liver lesions or suspected liver metastasis identified on CT. The sample represents the entire time period in which the additional MRI protocol was used.

For each patient data were collected on the radiological staging, histological staging, liver MRI results, as well as basic demographic data. Staging data included vascular invasion.

For analysis, presence of vascular invasion was used as a predictor. The patients were categorized into 4 groups based on the presence of pVi and rVi as detailed in their MDT notes and/or primary radiology reports. The prevalence of liver metastases in each group was assessed. Presence of liver metastasis was recorded on a per-patient basis, as opposed to a per-meta metastasis basis. MRI was taken to be gold standard for liver findings, therefore the MRI diagnosis superseded the CT liver findings.

The predictive values of rVi and pVi on the development of liver metastasis in these subset of 105 patients who had liver MRI imaging were assessed.

RESULTS:
A total of 562 post-operative CRC patients were discussed in the CRC MDT over the two year study period of which 105 had an MRI examination of the liver. Out of 105 patients who had a liver MRI, 56 (53%) had liver metastases. The remaining patients (52%) either had a normal liver or benign findings on MRI.

The largest group consisted of those with both rVi and pVi (50 cases). The majority (84%) of these patients had liver metastasis (Table 1 and Figure 2) and 20% of these were not visible on the initial staging CT (Table 2), thus benefiting most from the additional MRI study compared to the other groups. The highest predictive value for liver metastasis was for the presence of both rVi and pVi (Figure 2).

DISCUSSION:
Colorectal cancer (CRC) is one of the commonest malignancies worldwide. In the UK, it is the 4th most common cancer and accounts for nearly 12% of all new cases of cancer. Previous studies have suggested that pathologically and radiologically detected vascular invasion has a prognostic value in colorectal cancer in terms of survival. In our study majority of patients with vascular invasion shown on both pathology and radiology had liver metastasis (64%). The prevalence falls to 0% in patients with neither pathologically nor radiologically detected vascular invasion.

Algorithm for deciding on Liver MRI

CONCLUSION:
Vascular invasion is a strong predictor for the development of liver metastasis and we found the maximum benefit of screening with MRI liver in those patients who both had radiological and pathological vascular invasion. Within this group MRI provided additional diagnostic benefit compared to the current standard of CT.

REFERENCES: