Pre-operative imaging assessment prior to resection of pancreatic metastases from renal cell cancer: are computed tomography and endoscopic ultrasound enough?

Jianan Yuan [1], David Norton [1], John S Leeds [2], Daniel Parkinson [3], Abdullah K. Malik [4], Steven A. White [4], James W.A. Chambers [1]

[1] Department of Radiology, Newcastle Upon Tyne Teaching Hospitals Foundation Trust, Newcastle Upon Tyne, UK
[2] HPB endoscopy unit, Newcastle Upon Tyne Teaching Hospitals Foundation Trust, Newcastle Upon Tyne, UK
[3] Department of Cellular Pathology, Newcastle Upon Tyne Teaching Hospitals Foundation Trust, Newcastle Upon Tyne, UK
[4] Department of HPB and Transplant Surgery, Freeman Hospital, Newcastle Upon Tyne, UK

Introduction

Pancreatic metastases are rare, however renal cell carcinoma (RCC) is thought to be the most common primary tumour [1,2]. Metastatic spread can occur at the time of initial diagnosis or more frequently after nephrectomy [1,2]. Most patients suffering from pancreatic metastases are asymptomatic [1,2] and therefore imaging plays a vital role in detecting and characterising these lesions.

In our centre, diagnosis is usually made with triple phase computed tomography (CT) and endoscopic ultrasound (EUS). On CT, RCC metastases are typically hypervascular (figure 1); EUS usually demonstrates hypoechoic pancreatic lesions (figure 2). With increasing popularity of Magnetic Resonance Imaging (MRI), some clinicians favour the use of MRI in addition to both CT and EUS. On MRI, RCC pancreatic metastases typically demonstrate hypointense T1-weighted signal relative to pancreatic parenchyma and are usually hyperintense on T2-weighted images. Lesions smaller than 1.5cm normally enhance homogeneously and lesions larger than 1.5cm can have ring enhancement with central necrosis [3].

The aim of this project was to determine the accuracy with which CT, EUS, and MRI correlate with pancreatic resection histology in terms of number of metastases and location within the pancreas.

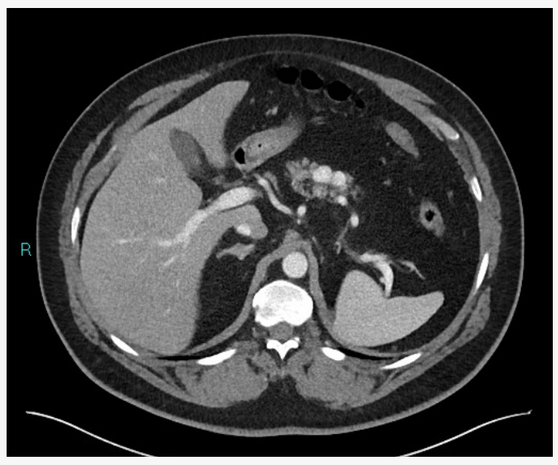

Figure 1

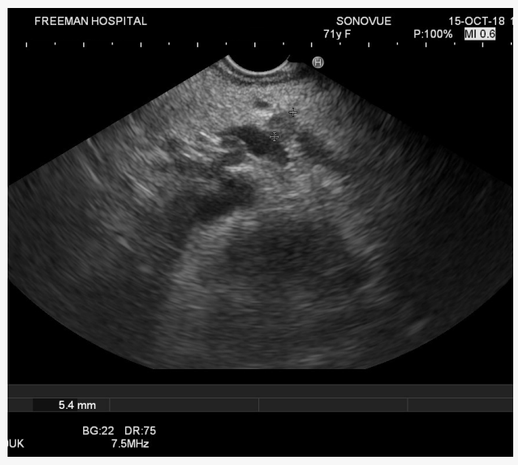

Figure 2

Methods

Retrospective analysis of all pathology reports of patients with RCC metastases resected from the pancreas were identified from September 2007 to August 2018. Pathology, radiology, and endoscopy reports were then reviewed to determine the number and location of metastases.

The total number of lesions reported on CT and EUS were compared to resection histology and correlation coefficients were calculated using Pearson Rho. Pearson's r values were interpreted as 0, meaning no relationship, >+0.30 as a weak positive relationship, >+0.50 as a moderate positive relationship, and +1.0 as a perfect positive relationship.

To assess agreement of radiology reported locations with surgical procedure locations, Cohen's Kappa was used. Kappa value was interpreted as <0 indicating no agreement, 0 to 0.20 as poor, 0.21 to 0.40 as fair, 0.41 to 0.60 as moderate, 0.61 to 0.80 as good, and 0.81 to 1 as almost perfect agreement.

Data was analysed using MedCalc (MedCalc Software, Ostend, Belgium).

Results

There were 22 pathology specimens from 21 patients. Out of the 21 patients identified, there was a demographic of 11 males, 10 females, and a mean age of 67.3. Two specimens were excluded from analysis: one due to lack of available pre-operative investigations, and one due to unavailability of pre-operative imaging. Therefore 20 pathology specimens from 20 patients were included in the study of which 10 patients had a total pancreatectomy, 7 patients had a distal pancreatectomy, and 3 had pancreatic head resections.

When comparing RCC pancreatic metastatic lesion numbers on different imaging modalities with the number of lesions reported from histology, CT had a coefficient of 0.45 (Rho 0.958) and EUS had a coefficient of 0.18 (Rho 0.829). When determining agreement with surgical procedure locations, CT had a Kappa of 0.77 and EUS had a Kappa of 0.65. Only six patients had pre-operative MRI, therefore this could not be accurately assessed.

Discussion

Our data has shown that when assessing RCC pancreatic metastases, both CT and EUS underestimated the number of lesions. Both modalities have good agreement with lesion locations as reported on histology; therefore, both modalities are complementary. The role of MRI within this patient group requires more data.

Our findings were discussed at our local hepatopancreaticobiliary (HBP) radiology team meeting and a new diagnostic pathway was proposed (Figure 3). If a patient has suspected RCC pancreatic metastases, triple phase CT pancreas will be performed for confirmation. The patient will then be discussed at the HPB multidisciplinary meeting (MDM). For patients that are considered for total pancreatectomy, EUS will be performed for biopsy and histology confirmation before proceeding to surgery. If the patient is being considered for partial pancreatectomy, contrast-enhanced MRI (CE-MRI) pancreas and EUS biopsy will be performed to ensure the best possible chance of identifying all pancreatic lesions. If required, the patient can be re-discussed at the HPB MDM before proceeding to surgery.

In the future when there is a sufficient sample size of MRI studies within this distinct patient subgroup, another study should be completed to analyse the accuracy of MRI modality with pancreatic resection histology.

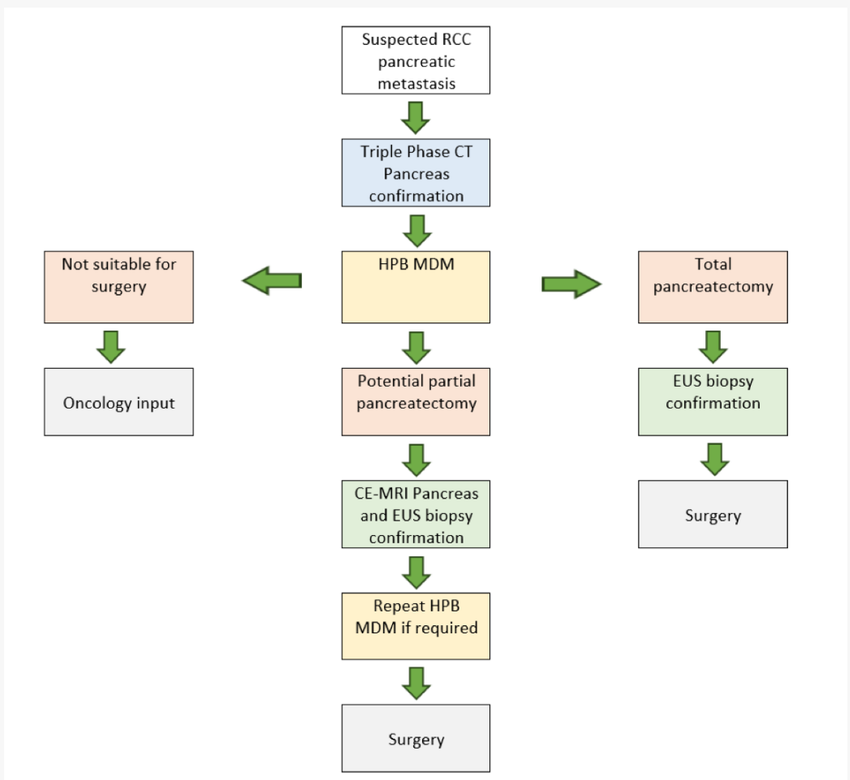

Figure 3

References

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