A problem Solving Approach to Focal Pancreatic Lesions

Christoforos Stoupis MD

The differentiation of focal pancreatic lesions has been always an issue in the radiological literature. Recent advances in surgical treatment and its potential benefits in the oncologic patients demonstrate the importance of imaging in the evaluation of focal pancreatic lesions. The additional “competitive” value of endosonography, performed by gastroenterologists, proclaim the immense importance of an objective radiological imaging technique, without operator dependency that could correct differentiate and characterize respectively solve diagnostic problems in case of a pancreatic lesion, found by sonography or endosonography or computed tomography (CT).

Cystic pancreatic lesions, discovered incidentally or in a symptomatic patients: Added value of MRI:

- Precise definition of the size, an important criterion for the following lesion evaluation
- Better approach (compared to CT) to a potential communication with the main pancreatic duct and/or its branches, in order to exclude or define the cystic mass as an IPMN (intraductal papillary mucinous neoplasm)
- Definition of the lesion morphology (septations, solid components) as opposed to CT and sonography, in order to better characterize the lesion: micro- vs macro-cystic lesion, solid lesion with solid components etc.
- Evaluation of the fluid components of the cystic lesion, such as in mucinous tumors.

Solid pancreatic lesions, found by other imaging modalities

- Additional value of MR sequences such as diffusion imaging, dynamic contrast enhanced studies that allow better tissue characterization and repetitive imaging without irradiation
- Due to inherent soft tissue contrast differences better approach to small focal lesions (such as neuroendocrine tumors) in the non enhanced imaging (i.e. fat suppressed sequence) and evaluation of multifocal lesions
- Better non enhanced imaging in the non cooperative patient due to respiratory triggered imaging
- Better approach of the fat planes in the retroperitoneal area in order to define extension of a pancreatic cancer outside the organ (stage II)
- Better approach of the entire retroperitoneal area specifically in case of post-inflammarory changes, as opposed to CT and sonography
- Additional value of flow imaging sequences and MR Angiography in case of cancer in order to define vascular involvement and exclude surgery (stage III).

- Additional value of MRCP (magnetic resonance cholangio pancreatography) in order to evaluate changes in the pancreatic duct supporting the potential of cancer or IPMN (one stop imaging, or all in one imaging).

- Additional value in potential differentiation of periampullary masses, specifically between pancreatic and cholangio carcinoma.

- Potential differentiation between mass-forming lesions such as pancreatitis and carcinoma.

Attention however should be paid to the fact that calcifications are not easily visible by MRI (i.e. in case of a microcystic adenoma) and this could be a minor drawback in a specific case.

In conclusion, in case of pancreatic carcinoma MRI all in one offers the best imaging technique in order to establish the correct staging. Furthermore in case of suspected neuroendocrine pancreatic lesion, MRI is technique of choise. In cases of cystic masses MRI is additional suggested in order to finalize the diagnosis before a potential FNA and/or surgery.

Islet Cell Tumor of the Pancreas: Biphasic CT versus MR Imaging in Tumor Detection


Tumoral and Nontumoral Pancreas: Correlation between Quantitative Dynamic Contrast-enhanced MR Imaging and Histopathologic Parameters Radiology November 2011 261:456-466

MR Imaging of the Pancreas: A Pictorial Tour Radiographics January 2002 22:e2