Clinical Guidelines for Gadolinium Based Contrast Agents for Hepatobiliary MR Imaging

Background: the following guidelines for liver MRI contrast enhanced imaging are based on the reported literature and our experience using "Eovist", a new hepatobiliary gadolinium based contrast agent. It is intended as a general guideline for residents and fellows protocolling studies, to decide when Eovist should be used. These guidelines are intended as a guide to improve uniformity of practice and to avoid patient call-backs, while balancing special needs of particular patients, and also to be mindful of the relative cost of Eovist (cost of Eovist is higher than other agents). Importantly, no prior imaging is required in order to protocol a study with Eovist.

Imaging Protocol: when Eovist is used, at least one high resolution T1 weighted sequence should be acquired at ≥20 minutes. High flip angle (30-40°) with high spatial resolution should be used, preferably with navigators.

Dose: the FDA approved package insert dose of Eovist is 0.025mmol/kg. Quantitative data demonstrate that 0.05mmol/kg provides adequate dosing for dynamic imaging. Dosing should be weight-based to avoid inadvertent high doses in small patients. If calculated dose 1ml greater than nearest bottle volume, dose should be reduced to reduce cost. eg. 10ml is OK if the calculated dose is 11ml.

General Principle: Eovist is preferred for bile duct imaging and lesion characterization using delayed imaging; Multihance is preferred for vascular imaging and characterization of lesions using dynamic imaging.

General Applications / Indications:

1. Cirrhotic Liver
   Major indications: HCC screening/evaluation, vascular complications of portal hypertension
   Recommended Agent: Multihance 0.1mmol/kg

2. Liver lesion characterization (non-cirrhotic): no prior imaging is required
   Major indications: detection of metastases to the liver, characterization of adenoma vs FNH, cholangiocarcinoma, characterization of unknown liver lesions (eg. unknown liver lesion, including possible hemangioma), etc.
   Recommended Agent: Eovist 0.05mmol/kg

3. Biliary Disease
   Major indications: PSC, bile duct injury/leak, stones, biliary masses, congenital biliary disease, etc
   Recommended Agent: Eovist 0.05mmol/kg
   **Please note that MRI or MRCP for evaluation of pancreatic lesions should use Multihance 0.1mmol/kg

4. Common Sense
   Please remember the general principles that Multihance should be used for vascular related pathology (eg. vessels, hemangiomas), and that Eovist should be used for liver lesions in non-cirrhotic livers and for biliary indications. It is entirely reasonable to switch agents if there is a good reason. Examples might include:
   1. Multihance for a liver lesion known to be a hemangioma on other imaging
   2. Eovist for additional characterization of possible HCC in cirrhotic liver.
   The above guidelines should serve as the default approach. Agents should not be switched unless there is a good reason to do so.