Gadoxetate disodium (Eovist)

Point – Counterpoint

Diego R. Martin, M.D., Ph.D.
The Cosden Professor and Chairman
Department of Radiology
University of Arizona College of Medicine
Tucson
dmartin@radiology.arizona.edu
Liver Disease Imaging

- Eovist structure and naming
- Pharmacodynamics
- Dose
- Cost
- Vascular enhancement - limitations
- Tumors - limitations
- Hepatocyte function and bile duct disease
- Summary and conclusion
**Eovist / Primovist**

- Gadoxetate disodium (Gd-EOB-DTPA)
  - Hydrophilic with lipophilic moiety:
    - Ethoxybenzyl group (EOB)
Eovist

- Clearance Rate = 250 ml/min
- 0.91-0.95/h
- 50% Hepatic + 50% Glomerular Filtration
Eovist

- Hepatocyte-biliary excretion
  - Carrier-mediated in common with taurocholate pathway (not conjugated bilirubin)
  - Organic anion transporting polypeptide (OATP)

Normal - Eovist

0 Min  0.3 Min  1 Min  3 Min  5 Min  10 Min  15 Min  20 Min
Liver Function

0.3 Min

1 Min

3 Min

5 Min

[Images of liver scans at different time intervals]
Liver Function

1 = Normal

2 = 2/4 CLD

3 = 4/4 ALD
Dose and Cost

- Half the relaxivity of standard agents
- One quarter the relaxivity of high-relaxivity (HR) agent (e.g. gadobenate dimeglumine)
Dose and Cost

- Our cost per single dose vial
  - Eovist ~$120  ($240 double dose)
  - Standard or HR agent ~$44
Vascular Enhancement

Eovist
0.025 mmol/kg

Godobenate Dimeglumine
0.05 mmol/kg

70 s “Portal Vein” Phase
Tumors – Eovist Uptake in the Hepatic Phase

- **FNH** takes up and retains agent in abnormally draining bile ductules in the tumor

- Malignant (or other benign) tumors do not take up the agent
Small Metastatic Lesion

Arterial

20 min
FNH
HCC

Pre

Arterial

2 min

20 min
Small Metastatic Lesion

Arterial  20 min
Small Metastatic Lesion

Eovist - 20 min
Small FNH

T2

Eovist - 20 min

OP

HR Agent - Arterial

Venous

Delayed
Hepatocyte Function and Bile Duct Disease
CLD - Fibrosis

HR Agent - Arterial 3 min T2

Eovist - 20 min
BD Injury and Obstruction
Hilar Cholangio Carcinoma
Superficial Spreading Subtype
Summary of Limitations

- Higher cost
- Impaired vascular evaluation
- Impaired/altered evaluation of chronic liver disease – fibrosis
- Net gain in tumor sensitivity and specificity questionable
Diffusion Weighted Images

- Case examples to show optimized methodology for specific tumor applications
NET Pancreas
NET Mets, Short and Long Acquisition DWI
Missed SQ Lymph Node, Conspicuous on DWI (Long Acq.)
Lymphoma
HCC
**DWI - Summary**

- On most systems consider benefits of longer respiratory triggered/fb technique.
- Inverted images improve visualization.
- Technical emphasis should be placed on optimizing single shot T2, fat suppression, and dynamic enhanced 3D GRE.