ACCURACY OF MR ENTEROGRAPHY COMPARED TO CT ENTEROGRAPHY IN YOUNG PATIENTS WITH BOWEL DISEASE.

M. M. Amitai[1], L. Raviv -Zilka[1], T. Kushnir[1], and S. Apter[1]

[1]Dept. of Diagnostic Imaging, Sheba Medical Center, Tel Hashomer, Israel

Background:

The relatively high radiation exposure in CT enterography is a growing concern when imaging the bowel, especially in young patients (including pregnant women) with chronic bowel disease. The improvement in MR coils and sequences opens the possibility of using MR as an alternative diagnostic modality for bowel imaging.

Purpose:

To compare the diagnostic accuracy of MR-Enterography (MRE) to CT- Enterography (CTE) in the evaluation of bowel disease.

Materials and Methods:

One hundred twenty nine consecutive patients were referred for MRE during a period of three years (2005-8). Only those who underwent CTE within a 6 month interval, before or after MRE (36 patients), were included in the study. MR studies were performed on a 1.5T GE Signa HDx MR System ver 14. The MR protocol included: Ax, Cor and Sag Fiesta, TR/TE 4.3/1/9 ms, Ax and Cor 2D SSFSE T2w, TR/TE 1680-3200/92.7 ms, Ax and Cor FSPGR FS BH, TR/TE 150/1.3 ms, pre and post Gd- DOTA injection, Cor LAVA, TR/TE 4.2/2.1 ms, pre and post Gd injection, FOV was 32-40 cm and slice width 3.6-6 mm. Manitol 5% (1000 ml) was orally administered 60 minutes prior to the examination, followed by IV injection of Glucagon (1 mg) and Gd (0.1 mmol /Kg). CTE was performed after oral ingestion of Telebrix, 3 doses of 500 ml, given at 90, 60 and 30 minutes before the procedure and IV injection of 100 ml of Iopamiro. CTE and MRE studies were reviewed by two board certified radiologists. Each radiologist interpreted each study in a randomized order, independently, and blinded to the patient's clinical data. The radiological features evaluated included mural and extra mural findings. Mural findings included: bowel wall thickening, luminal narrowing and prestenotic dilatation. Comparative extramural findings were: the presence of abscess, phlegmon and fistula. Statistic evaluation was performed using Mc Nemar test, and SPSS Ver 15.0.

Results:

Thirty six patients (19 M, 17 F) mean age 27 years, (range 16-48) had MRE and CTE within 6 months (average 2 months). The indications for MRE were: Crohn disease - 26, Abdominal pain – 3, Ulcerative colitis - 2, Rectal bleeding – 1, Lymphoma – 2, Celiac, - 1, Cystic Fibrosis – 1, including four pregnant patients. MRE correlated well with CTE regarding mural findings. The accuracy was 89% for bowel wall thickening and 72% for luminal narrowing. Regarding extramural finding an accuracy of 100% was seen for abscess, 91% for phlegmon, and 65% in the diagnosis of fistula .

Conclusion:

MRE and CTE have similar diagnostic accuracies in detecting bowel disease. MRE is a reliable modality for diagnosing chronic bowel disease and should be recommended especially in young patients and in pregnant women, in whom radiation exposure can be particularly hazardous.
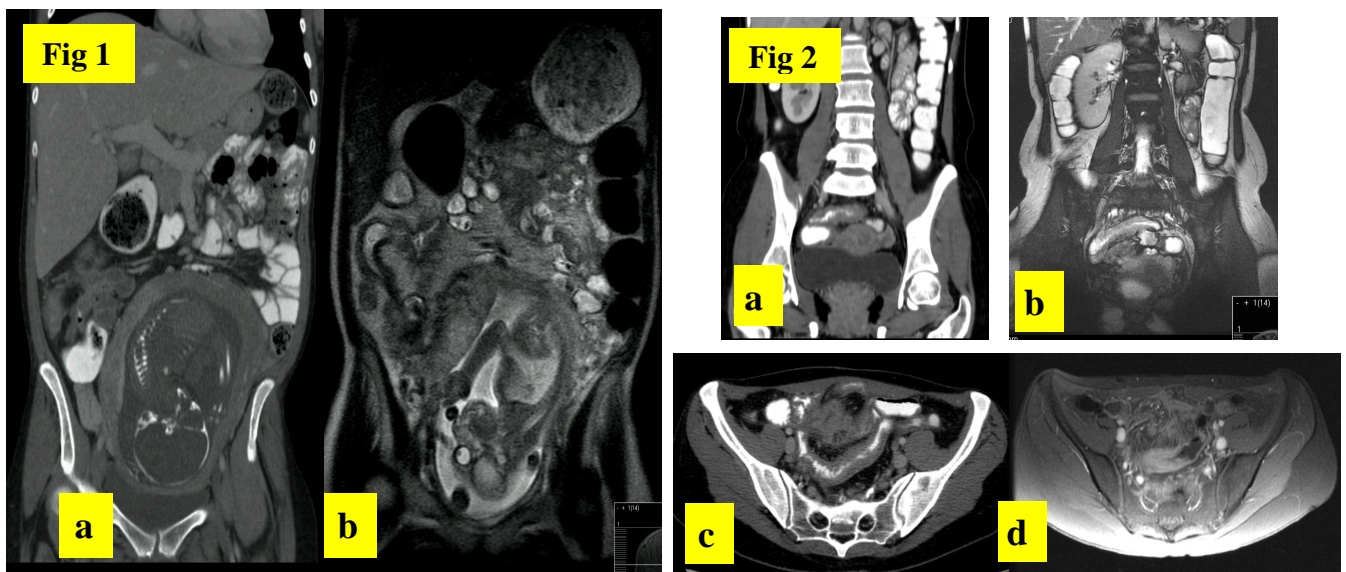

Fig 1: 28-Y-old pregnant woman with Crohn disease Coronal.CTE) (a) and MRE (b):
The' star sign' representing an inter-communicating sinus tract between involved small bowel loops

Fig 2: 19 -Y-old man with Crohn disease.
Coronal and axial CTE (a,c) and MRE(d,b):
Small bowel wall thickening and luminal narrowing (arrows)