Role of MRI enterography in the evaluation ofPatients with Crohn's Disease

Essay

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By

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بسم الله الرحمن الرحيم

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والحكمة وعلّمك ما لم تكن تعلم
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List of abbreviations

CD:	Crohn's disease
CDAI:	Clinical disease activity index
CE-MR:	Contrast enhanced magnetic resonance.
CRP:	C-reactive protein.
DWI:	Diffusion weighted image.
GBCA:	Gadolinium based contrast agent.
HASTE:	Half-Fourier Acquisition Single-Shot Turbo Spin-Echo
MRE:	Magnetic resonance enterography.
NSF:	Nephrogenic systemic fibrosis
ROI:	Region of interest.
SB:	Small bowel
SMV:	Superior mesenteric vein
SSFP:	Steady-state free precession.
SSFSE:	Single shot fast spin echo.
TPN:	Total parenteral nutrition.

INTRODUCTION And AIM OF WORK

Cronh's disease is an idiopathic chronic inflammatory disease of the gastrointestinal tract that has varying levels of severity, diverse manifestations, and an unpredictable course that includes frequent relapses. The etiology of Crohn's disease is complex and likely multifactorial, with genetic, immunologic, infectious, microvascular, and possibly environmental and lifestyle factors contributing **(De Hertogh et al, 2008); (Cho, 2008).** It often affects young patients, who are most vulnerable to the potential adverse effects of repeated exposure to ionizing radiation from computed tomography performed for diagnosis and surgical planning. The small intestine is the bowel segment that is most frequently affected, but it is the least accessible with endoscopic techniques.

Clinicians often use medical history, laboratory data, and physical examination to assess disease activity and complications, but these tools are relatively nonspecific. Clinical observations of disease activity are subjective and prone to significant interobserver variability **(Freeman, 2007).**Because the symptoms of active inflammation and those of complications may be indistinguishable, imaging often is needed .

Patients frequently are subjected to multiple imaging examinations in which they are exposed to ionizing radiation;imaging of patients with Crohn's disease traditionally has included a combination of fluoroscopic and computed tomographic (CT) techniques to assess the small bowel. The former method consists of small-bowel follow-through examinations and enteroclysis, which provide views of the bowel lumen and mucosal surface but only limited, indirect information about extraenteric complications. CT provides detailed information about the bowel wall and extraenteric structures at the expense of mucosal detail. Recognizing the complementary nature of these techniques, investigators have sought to combine the best of both in CT enteroclysis and CT enterography **(Rollandi, 1999); (Romano, 2005).**Despite the diagnostic success attained with these CT techniques, their use is limited because of their dependence on ionizing radiation, a significant liability given the need for repetitive imaging in a subset of young patients with Crohn'sdisease **(Jaffe, 2007).**

These challenges highlight the need for a cross-sectional imaging technique that is sensitive enough to allow detection of bowel inflammation and its complications and that allows differentiation between acute disease that can be managed medically and disease that requires surgery. In addition, the ideal imaging test would be reproducible, well tolerated by patients, and free of ionizing radiation.

Magnetic resonance (MR) enterography has the potential to safely and noninvasively meet the imaging needs of patients with Crohn's disease without exposing them to ionizing radiation. MRE has improved soft tissue contrast, which is important for detecting subtle pathologic areas. It is particularly helpful for detection, staging and follow-up of perianal fistulae. MRE also enables static and dynamic studies that provide real-time and functional imaging. By using multiphase imaging techniques, bowel peristalsis and distensibility can be evaluated. MRE helps to determine the cause of bowel narrowing, i.e. whether they are due to contractions or to fixed strictures. Due to the safety profile of gadolinium contrast agents, the technique may be preferred in patients who are allergic to iodine contrast medium.

AIM OF THE WORK

To assess the value of MRI enterography in Crohn's disease as a primary diagnostic tool and for follow up of chronic patients and detecting complications.

Chapter (1)

Anatomy of the SmallBowel
Gross anatomy

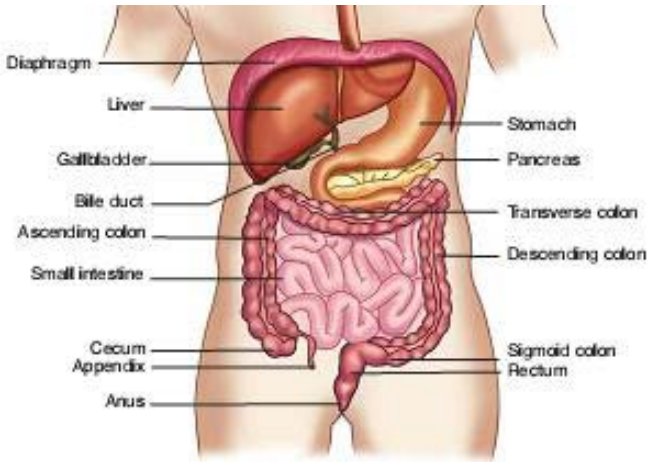

Figure (1): The gastrointestinal tract **(Halvorson, 2008).**

The small intestine is that portion of the gastrointestinal tract (GIT) between the pyloric sphincter of the stomach and the ileocecal valve that opens into the large intestine. The length of the small intestine varies from 10-33 feet (3–10 meters). The average length is considered to be approximately 22 feet (6.5 meters) **(Gourevitc, 2006).**

The mesentery of the small intestine has a 6 inch (15 cm) origin from the posterior abdominal wall and commences at the duodenojejunal junction, just to the left of the second lumbar