Role of CT Enterography and MR Enterography in the Assessment of Small Bowel Crohn's Disease

Essay

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بِسْمِ اللَّهِ الرَّحْمَٰنِ الرَّحِيمِ
قَالُوا سُبْحَانَكَ لَا عِلْمَ لَنَا إِلَّا مَا
عَلَّمْتَنَا إِنَّكَ أَنْتَ الْعَلِيمُ الْحَكِيمُ

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List of Abbreviations

Abbrev.	Full term
CD	: Crohn's disease
CM	: Contrast media
CT	: Computed Tomography
CTE	: Computed tomogrsphy enterography
DVT	: Deep venous thrombosis
FISP	: Fast imaging with steady state precession
FLASH	: Fast low angle shot
GRE	: Gadolinium-enhanced Fat-suppressed Spoiled Gradient-Echo
HASTE	: Half fourier acquisition single shot turbo spin echo
IV	: Intra venous
MDCT	: Multi-detector Computed Tomography
MRE	: Magnetic resonance enterography
MRI	: Magnetic Resonance Imaging
MSCT	: Multi slice Computed Tomography
SBO	: Small bowel obstruction
SI	: Small intestine
SSFP	: Steady-state free precession
TSE	: Turbo Spin-Echo
VOL	: Volume
WI	: Weighted image
WT	: Weight
3D	: Three dimension

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Introduction

Crohn's disease (CD) is an idiopathic chronic inflammatory disease of the gastrointestinal tract that has varying levels of severity, diverse manifestations, and an unpredictable course ***(Loftus et al., 2002).***

The etiology of (CD) is complex and likely multifactorial, with genetic, immunologic, infectious, microvascular, and possibly environmental and lifestyle factors contributing ***(Hertough, 2008).***

Enteric involvement tends to be segmental, and inflammation often is transmural. Superficial mucosal (aphthous) and deep linear ulcers may be present, separated by segments of uninvolved mucosa, depending on the severity and chronicity of (CD) ***(Gramlich and Petras, 2007).***

Barium small bowel follow-through studies and enteroclysis have been the traditional radiologic standards of reference for assessment of the small bowel. However, both techniques may fail to clearly depict extraluminal complications such as fistula and abscess formation, and both have limited sensitivity, particularly when there are overlapping pelvic loops. In addition, there is a radiation burden with both techniques ***(Jaffe et al., 2007).***

Conventional endoscopy, although it provides a direct view of the mucosal surface, is limited to the proximal small bowel or to the distal terminal ileum as it can only assess the superficial mucosa and does not evaluate the transmural inflammatory process in (CD) and as it's invasive it's inconvenient for follow up of the patient to assess response to treatment ***(Cirillo et al., 2000).***

Computed tomographic (CT) enterography with the use of oral neutral contrast agents and rapid intravenous contrast infusion can be used to reliably identify active inflammation in the small intestine as well as clear depiction of complications ***(Hara et al., 2006).***

However, CT enterography has a high radiation burden, especially in young patients, who may require multiple examinations over several years ***(Jaff et al., 2007).***

MR imaging of the small bowel combines a high-tissue-contrast examination with multiplanar interrogation of the abdomen and pelvis. There is no ionizing radiation burden, a major advantage in young patients. Furthermore, like CT enterography, MR imaging allows excellent depiction of the complications of inflammatory bowel disease ***(Wiarda et al., 2006).***