CURRENT CONCEPTS IN IMAGING OF SMALL BOWEL OBSTRUCTION

Essay

SUBMITTED FOR THE PARTIAL FULFILLMENT OF THE MASTER DEGREE IN RADIODIAGNOSIS

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بسم الله
الرحمن
(قَالُوا سُبْحَانَكَ لاَ
عِلْمَ لَنَا إِلاَّ مَا
عَلَّمْتَنَا إِنَّكَ أَنتَ
الْعَلِيمُ الْحَكِيمُ)
صدق الله

Acknowledgment

First and foremost, my deep gratefulness and indebtedness is to Allah, the Most Gracious and the Most Merciful.

I wish to express my deep gratitude and respect to **Prof. Dr. Sahar Naim Mohamed Salem**, the professor of radio-diagnosis, faculty of medicine, Ain Shams University, for her patience, profound suggestion, valuable advices, continuous encouragement and judicious guidance.

I would like to express my great thanks to **Dr. Amal Amin Abu El-Maaty**, lecturer of radio-diagnosis, faculty of medicine, Ain Shams University, for her sincere advice and kind support all through this study.

I would also like to thank, all those extended to me a helping hand for this work.

Lastly and not least, I send my deepest love to my parents, my family, for there care and ever-lasting support.

List of contents

List of abbreviations

٢D	Two Dimensional
٣D	Three Dimensional
AIDS	Aquired Immune Deficiency Syndrome
CD	Crohn's Disease
CT	Computed Tomography
FOV	Field Of Vision
GIT	Gastro Intestinal Tract
GISTs	Gastro Intestinal Stromal Tumours
HU	Hounsfield Unit
MDCT	Multi-Detector Computed Tomography
MHZ	Mega Hertz
MRE	Magnetic Resonance Enteroclysis
MRI	Magnetic Resonance Imaging
MSCT	Multi-Slice Computed Tomography
PID	Pelvic Inflammatory Disease
SBO	Small Bowel Obstruction
SMA	Superior Mesenteric Artery
TCA	Tri Cyclic Antidepressant
TE	Time of Echo
TR	Time of Repeatition
US	Ultra Sonography
Z-axis	Longitudinal axis of acquisition

List of tables

List of figures

Abstract

Current concepts in imaging of small bowel obstruction

The diagnosis of SBO is a challenging, as it constitutes a variety of examination techniques that must be performed.

The three most common causes of small bowel obstruction are Adhesions, Crohn's disease and neoplasia

Plain abdominal radiograph, double-contrast barium studies and ultrasound are valuable examinations techniques in diagnosis of small bowel obstruction; whereas cross-sectional imaging, as CT and MRI, has important roles in the precise valuation of SBO.

The conclusion is that MDCT is the most reliable, advanced and non-invasive technique for diagnosis and evaluation of different causes of SBO.

Key words:

MDCT, Acute abdomen, Crohn's disease, Small bowel obstruction.

Anatomy of small intestine

I. Gross anatomy of small intestine:

The small intestine is a convoluted tube of the gastro-intestinal tract extending from the pyloric sphincter of the stomach to the ileocecal valve that opens into the large intestine. It's called "small" because of its relatively small diameter compared to that of the large intestine. It is very mobile and lies in coils in the central and lower portions of the abdominal cavity and is supported, except for the first portion, by the mesentery ***(Halligan, 2003)***.

The small intestine is the body's major digestive organ and the primary site of nutrient, as it averages approximately ٦-٧ m in length and ٢,٤ cm in wideth, and the surface area of the intestinal wall is increased by plicae circulares, intestinal villi, and microvilli ***(Halligan, 2003)***.

The **fan-shaped** mesentery permits movement of the small intestine; but leaves little chance for it to become twisted or kinked (Fig. ١). Enclosed within the mesentery are blood vessels, nerves, and lymphatic vessels that supply the intestinal wall ***(Umschden et al., 2004).***

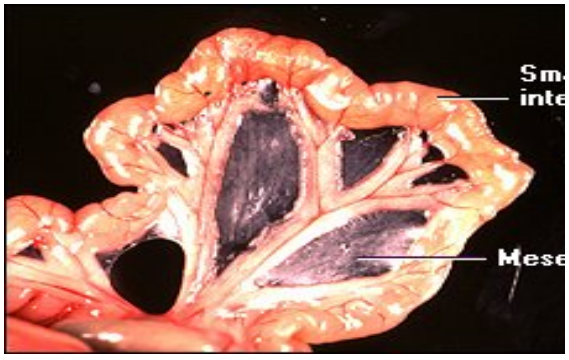

Figure (١): Loop of small intestine fan-shaped mesentery ***(Umschden et al., 2004)***.

The small intestine is innervated by the superior mesenteric plexus; the branches of the plexus contain sensory fibers, post-ganglionic sympathetic fibers, and pre-ganglionic para-sympathetic fibers. The arterial blood supply to the small intestine is through the superior mesenteric artery, branches from the celiac trunk and the inferior mesenteric artery. The venous drainage is through the superior mesenteric vein. This vein unites with the splenic vein to form the hepatic portal vein, which carries nutrient-rich blood to the liver ***(Halligan, 2003).***

Regions of the small intestine:

On the basis of function and histological structure, the small intestine is divided into three regions:

Duodenum:

The duodenum is relatively fixed, C-shaped tubular organ and measuring approximately ٢٥ cm from the pyloric sphincter of the stomach to the duodeno-jejunal flexure (Fig. ٢). Except for a short portion near the stomach, the duodenum is retro-peritoneal and lacks a mesentery. Its concave surface faces to the left, where it receives bile secretions from the liver and gall bladder through the common bile duct and pancreatic secretions through the pancreatic duct of the pancreas ***(Gore and Levine, 2004).***