Endoscopy versus Radiology in diagnosis of small bowel diseases

Essay

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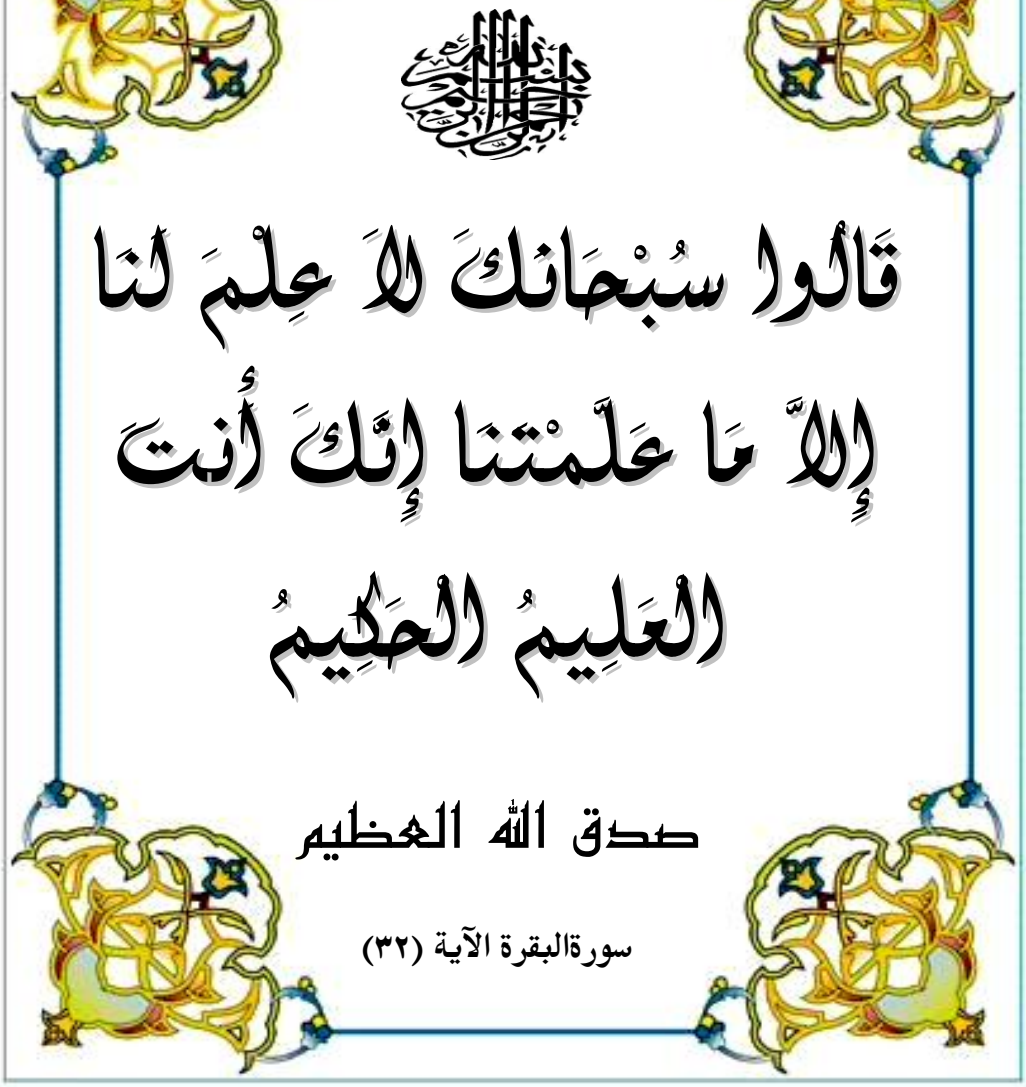

قَالُوا سُبْحَانَكَ لاَ عِلْمَ لَنَا
إِلاَّ مَا عَلَّمْتَنَا إِنَّكَ أَنتَ
الْعَلِيمُ الْحَكِيمُ

صدق الله العظيم

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Finally, my truthful affection and love to my parents, my family, who were, and will always be, by my side, all my life.

Contents

List of Abbreviations

APC; argon plasma coagulation

CHUSI: Chronic Hemorrhagic Ulcers of the Small Intestine

CIs: Confidence Intervals

CT: Computed Tomo graphy

CVP: Central Venous Pressure

DBE: Double Balloon Enteroscopy

EBD: Endoscopic-Balloon Dilation

EGD: Esophagogastroduodenoscopic

FDA: Food and Drug Administration

FEM: Fixed-Effect Model

GAG's: Glycosaminoglycans

GI: Gastrointestinal

IBD: Inflammatory Bowel Disease

IY: Incremental Yield

MGH: Massachusetts General Hospital

MRI: Magnetic Resonance Imaging

MSAC: Medical Services Advisory Committee

NETs: Neuroendocrine Tumors

NSAIDs: Non-Steroidal Anti-Inflammatory Drugs

OGIB : obscure gastrointestinal bleeding

REM: Random-Effect Model

SAP: Serum Amyloid P

SB: Small Bowel

SBE: Single-Balloon Endoscopy

SBO: Small-Bowel Obstruction

TTS: Through-The-Scope

VCE: Video Capsule Endoscopy

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Introduction

Endoscopy versus Radiology in diagnosis of small bowel diseases

A few years ago, the assessment of small bowel pathology was a major dilemma, especially when it came to the management of obscure gastrointestinal bleeding. Evaluation of the patients was frequently unsatisfactory because of the inability to completely visualize the small bowel mucosa with the available endoscopic and radiological techniques ***(Muñoz-Navas, 2009).***

It is the most difficult part of the bowel to examine owing to the distance from the mouth to anus. Conventional endoscopic techniques for examining the small bowel are limited by its length and its multiple, complex, looped configurations. ***(Hartmann et al., 2004).***

The small bowel has ever since been the "black box" of endoscopy. ***(Rosenbaum and Riemann, 2006).*** In routine practice, only the last few centimeters of the ileum were accessible to retrograde visualization by ileocolonoscopy. Exploration from the proximal side by push, sonde or intraoperative enteroscopy was invasive procedures that did not always allow us to visualize the lesions in the small bowel ***(Galmiche et al, 2008).***

New technology of wireless capsule endoscopy allows the endoscopic imaging of the complete small bowel (***Rosenbaum and Riemann, 2006).***

Capsule endoscopy has developed from being an emerging method in gastroenterology to become a clinical reality, and it must now be considered critically ***(Pennazio, 2004)***. It is a novel technology that facilitates highly effective and non-invasive imaging of the small bowel ***(Kav and Bayraktar, 2009)***.

It is a simple, safe, non-invasive, reliable technique, well accepted and tolerated by the patients, which allows complete exploration of the small intestine ***(Muñoz-Navas, 2009).***

Double balloon enteroscopy (DBE) is a new technique, first published and introduced into clinical practice in 2001 by Yamamoto, the inventor of this outstanding method. DBE allows complete visualization, biopsy and treatment of the small bowel ***(Kopacova et al., 2010).***

Several years ago, the only methods to assess the small bowel were conventional enteroclysis or a small-bowel follow-through. In recent years, with the introduction of helical scanning and then Multidetector CT technologies, the accuracy for diagnosing digestive tract diseases with CT has been highly improved, and CT is used more and more in the evaluation of patients with suspected gastrointestinal disorders. Within this context, CT enterography, which is also referred to as "CT enteroclysis," was developed to enable the evaluation of luminal, extraluminal, and mural alterations of the small bowel ***(Brizi et al., 2002)***.

CT Enterography is a new diagnostic tool in evaluating small bowel disorders and becoming the first-line modality for the evaluation of suspected inflammatory bowel disease. CT enterography has also become an important alternative to traditional fluoroscopy in the assessment of other small bowel disorders such as celiac sprue and small bowel neoplasms ***(Paulsen et al., 2006).***

Also magnetic resonance imaging (MRI) is increasingly used in the assessment of small bowel diseases. Unlike conventional radiology, MRI enables visualization of disease extension beyond the intestinal wall, i.e., abscesses and fistulas ***(Jensen et al., 2010).***

Small bowel imaging has been revolutionized by CT enterography and capsule endoscopy. Both methods complement each other often providing information that the other one cannot ***(Boriskin et al., 2009)***

Capsule endoscopy and CT enterography may depict nonobstructive Crohn disease of the small bowel when conventional techniques such as ileoscopy or small-bowel follow-through produce negative or inconclusive findings ***(Hara et al., 2006).***

Capsule endoscopy has been compared with traditional radiographic methods of examining the small bowel. Although this innovative diagnostic method has now entered clinical practice, it must be stressed that both push enteroscopy and intraoperative enteroscopy still have a precise and valid role in the management of patients with small-bowel diseases ***(Pennazio, 2004)***

Aim of the work

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To revise the recent updates regarding clinical benefits, feasibility and utility of endoscopy as capsule endoscopy and double-balloon endoscopy compared with radiology as computerized tomography and magnetic resonance imaging in the evaluation of small bowel diseases.

Anatomy of the small intestine

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The average length of the small intestine in an adult human male is 22 feet (6.9 meters), and in the adult female 23 feet (7.1 meters). However, it can vary greatly, from as short as 15 feet (4.6 m) to as long as 32 feet (9.8 meters). It is approximately 2.5-3 cm in diameter ***(Townsend, 2004)***.

The small intestine is divided into three structural parts looking similar to each other at a microscopic level:

- Duodenum.
- Jejunum.
- Ileum.

(Thomson et al., 2003)

Duodenum:

The duodenum is the first part of the small intestine. It is approximately 25 cm long and curves around the head of the pancreas.

it is divided into first, second, third and fourth parts. The first and second parts are respectively superior and descending, while the third and fourth parts are respectively horizontal and ascending.

The superior part (first part) is about 5 cm long, and is the most movable of the four sections; it begins at the pylorus, and ends at the neck of the gall bladder.

The descending part (second part), from 8 to 10 cm long, descends from the neck of the gall bladder along the right side of the vertebral column as low as the lower border of the body of the third lumbar vertebra.