Multislice Computed Tomography in the Diagnosis of Small Bowel Obstruction

A Thesis
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ABSTRACT

Purpose:
To assess and confirm the role of multislice computed tomography (MSCT) with its new applications such as reformatted images, high resolution imaging and enterography for diagnosis and its impact on management of SBO.

Materials and Methods:
40 patients were examined by CT (30 patients with high grade SBO by MSCT of the abdomen and pelvis and 10 patients with low grade SBO by MSCTE). This was done over the period of 4 years.

The age range was 14 to 93 years and 29 patients were males and 11 were females

Results:
The study revealed a very high sensitivity and specificity of the MSCT for high grade small bowel obstruction and similar results for MSCTE for low grade SBO reaching up to 100%.

Conclusion:
The MSCT and MSCTE in cases of SBO have an undeniable pivotal role in determining the course of treatment and they certainly decrease the morbidity and mortality rates caused by this illness.
ABBREVIATIONS

- 3D: Three Dimension
- AIP: Average Intensity Projection
- Cc: Cubic Centimetre
- CT: Computed Tomography
- CTA: Computed Tomography Angiography
- Fig: Figure
- GB: Gall bladder
- GE: General Electric
- GIST: Gastro-intestinal stromal tumor
- GSI: Gall Stone Ileus
- Gy : Gray
- HU : Hounsfield Unit
- IgA: Immunoglobulin A
- IV : Intra-Venous
- KVp: Kilovolt Potential
- LBO: Large bowel obstruction
- mA: mili-Ampere
- mAs: mili Ampere per second
- MDCT: Multi-Detector Computed Tomography
- mGy : Milli-Gray
- MIP: Maximum Intensity Projection
- mm: Millimetre
- MPR: Multi-Planar Reformat
- MSCT: Multi Slice Computed Tomography
- MSCTE: Multi Slice Computed Tomography Enterography
- MVO: Mesenteric Venous Occlusion
- MVT: Mesenteric venous thrombosis
- NHL: non-Hodgkin lymphoma
- No : Number
- ROI: Region of Interest
- SBO: Small Bowel Obstruction
- SMA : Superior Mesentric Artery
- SMV : Superior Mesentric Vein
- SSD: Shaded Surface Rendering
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الملخص العربي
INTRODUCTION
AND AIM OF THE WORK
INTRODUCTION

Intestinal obstruction is a mechanical or functional obstruction of the intestines, preventing the normal transit of the products of digestion. It can occur at any level distal to the duodenum of the small intestine and is a medical emergency. Symptoms include cramping pain, vomiting, obstipation, and lack of flatus. Diagnosis is clinical, confirmed by radiography. Treatment is fluid resuscitation, naso-gastric suction, and, in most cases of complete obstruction, surgery. (Ansari, 2009).

Small bowel obstruction (SBO) is a common clinical condition that occurs secondary to mechanical or functional obstruction of the small bowel, preventing normal transit of its contents. It is a frequent cause of hospitalization and surgical consultation, representing 20% of all surgical admissions for acute abdominal pain (Foster et al, 2006).

The radiologic investigation of patients with SBO and the indications for and timing of surgical intervention have changed over the past two decades (Maglinte, 2008). The old paradigm of the general surgeon when confronted with a possible SBO was to “never let the sun set or rise on an obstructed bowel.” This approach reflected the clinical and radiologic limitations of the preoperative recognition of strangulation. Nowadays, owing to the increased application of advanced modalities of abdominal imaging in the clinical context of SBO, combined with the widespread assumption that most of these conditions resolve spontaneously with nonsurgical treatment, namely naso-intestinal decompression, imaging has become the primary focus in the treatment of patients with SBO (Silva et al, 2009).
Therefore, radiology assumes considerable relevance in assisting the therapeutic decision of the surgeon in cases of SBO by addressing the following questions: Is the small bowel obstructed? How severe is the obstruction, where is it located, and what is its cause? Is strangulation present? (*Silva et al, 2009*).

Standard computed tomography (CT) emerged two decades ago as the preeminent imaging modality for preoperative evaluation of SBO, with sensitivity of 90%–96%, specificity of 96%, and accuracy of 95%. However, these results appear to apply mostly to cases of high-grade obstruction, with low-grade obstruction being a relative “blind spot” for standard CT. Newer multidetector CT scanners with multiplanar reformation capability are significantly more effective in evaluation of SBO and correlation of the obstruction with pathologic tissue damage. It is a fast examination, it usually does not require oral contrast material because the retained intraluminal fluid serves as a natural negative contrast agent and it is capable of early demonstration of strangulation (*Ros et al, 2006, Qalbani et al, 2007 and Silva et al, 2009*).
Aim of the Work

The aim of the current study is:

To assess and confirm the role of multislice computed tomography (MSCT) with its new applications such as reformatted images, high resolution imaging and enterography for diagnosis and its impact on management of SBO.
REVIEW OF LITERATURE