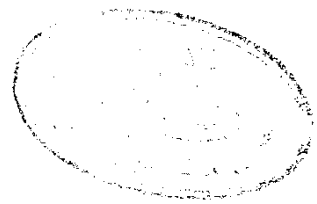
VALUE OF PRESACRAL SPACE AS DEMONSTRATED BY BARIUM ENEMA

Thesis

Submitted For Partial Fulfillment Of Master Degree In Radiodiagnosis



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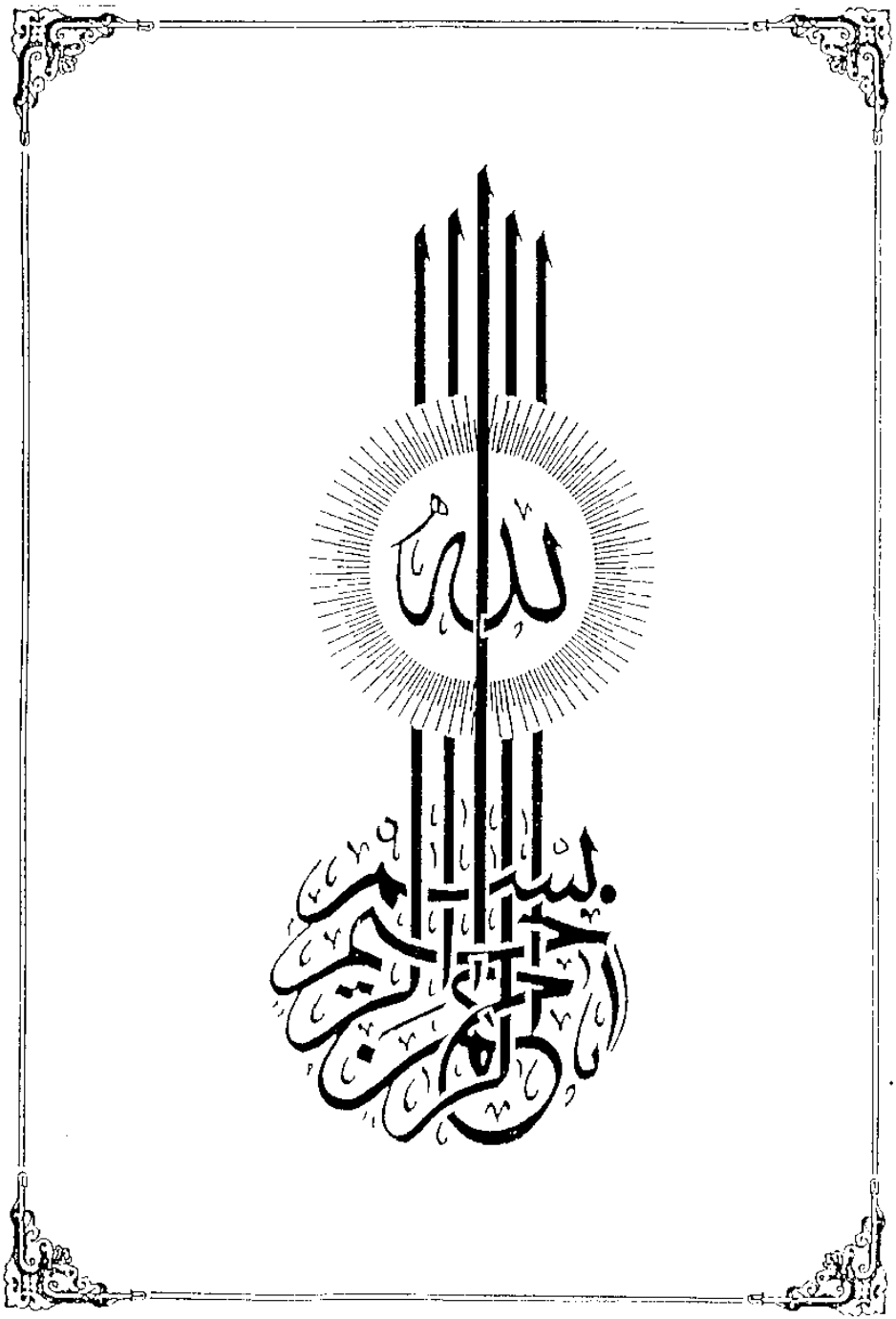

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Introduction and Aim of the Work

The colon is an important organ of the body. It has many functions to fulfill including storage, concentration and execretion of faecal matters. Besides it also secretes, absorbs physiologically important substances as the bile salts. Often, it is the site of many disease processes which may be mild or severe enough to affect the general health and well being. Clinical picture and examination are not often sufficient to warrant a specific diagnosis. Several other measures are frequently restored to arrive to a proper diagnosis including colonoscopy and biopsy. However barium enema examination is still the single important radiological means to study the colon. It gives a clear view of its morphology and state of its wall besides the mucosa is often beautifully outlined and any small lesions are often not missed. It includes both single and double contrast examination, the latter being often resorted to show polypoid lesions of the colon.

The routine use of lateral radiographs of the rectum has largely added to the usefulness of barium study of the colon. The space between the rectum and hollow of the sacrum is often neglected, though it might help in the diagnosis of colic and extracolic lesions. Measurement of the distance is often helpful in this respect.

The aim of this study is to show the presacral space as seen in lateral radiographs of the rectum and to show the range of measurements in the normal and try to demonstrate its value in the diagnosis of different disease processes.

ANATOMY OF THE LARGE INTESTINE

Anatomy of the Large Intestine

The large intestine extends from the end of the ileum to the anus, and is about 1.5 meter long. Its calibre is greatest at its commencement at the caecum, and gradually diminishes as far as the rectum. Its functions is chiefly the absorption of fluid and solutes. (Warwick and Williams, 1973).

It commences in the right iliac region in a dilated part termed the caecum, it ascends through the right lumbar and hypochondriac regions to the inferior surface of the liver; here it bends to the left (the right colic flexure) and curving with a downward and forward convexity, passes, as the transverse colon, across the abdomen to the left hypochondriac region; it then bends again (the left colic flexure), and descends through the left lumbar and iliac regions to the lesser pelvis, where it forms a sinuous loop, the sigmoid colon. From this it is continued along the lower part of the posterior wall of the pelvis to the anus.

It is divided into the caecum, the colon, the rectum and the anal canal. (Warwick and Williams, (1973).

The Caecum:

The caecum, the commencement of the large intestine, is in the right iliac fossa. The ileum opens into the large intestine on its medial side.

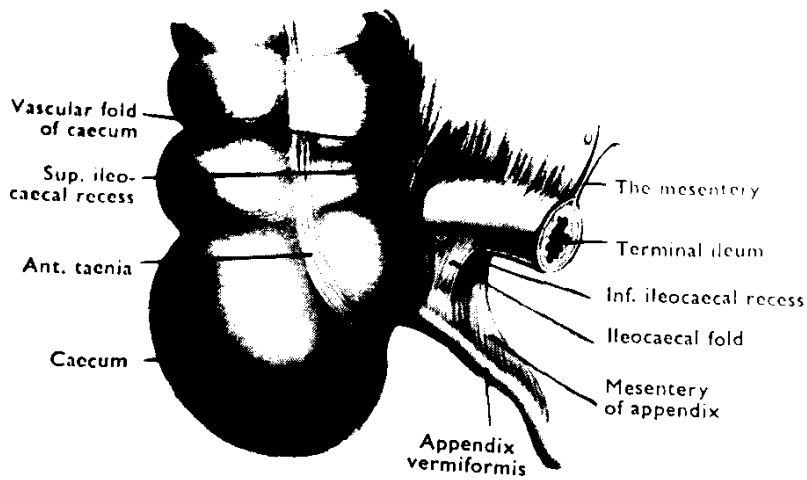

Fig (1): The anterior surface of the ileocaecol region.

"Quoted from Cunningham's, 1977".

Its average axial dimension is about 6cm and its breadth about 7.5cm. In the right iliac fossa it is superior to the lateral half of the inguinal ligament. Usually, it is entirely enveloped by peritoneum. (Warwick and Williams, 1973).

The Ileo-caecal valve (Fig. 1):

The terminal ileum opens into the medial wall of the large intestine at the junction of the caecum and ascending colon. An upper and a lower fold project within, like a pair of pouting lips. No valvular formation exists, and the opening is controlled by a certain thickening of the circular muscle of the terminal inch or two of the ileum which constitutes a sphincter. (Last, 1978).

The vermiform appendix:

The vermiform appendix, is a narrow, worm-shaped tube, which springs from the postero medial wall of the caecum, 2cm or less below the end of the ileum, and may occupy one of several position:

(a) Retrocaecal and retrocolic.

(b) Pelvic or descending.

(c) Subcaecal.

(d) It may be in front of the terminal part of the ileum and may then be in contact with the anterior abdominal wall.

(e) It may be behind the terminal part of the ileum.

The three taenia coli of the ascending colon and caecum converge on the base of the appendix.

The coats of the vermiform appendix are the same as those of the intestine; serous, muscular, submucous and mucous. (Warwick and Williams, 1973).

The Colon:

The colon may be considered in four parts - the ascending, transverse, descending and sigmoid.

The ascending colon:

About 15cm long, is narrower than the caecum. It begins at the caecum, and ascends to the inferior surface of the right lobe of the liver, where it is lodged in a shallow colic depression; here it bends abruptly forwards and to the left, forming the right colic flexure. It is surrounded by peritoneum except where its posterior surface is connected by areolar tissue to the fascia over the iliacus, iliolumbar ligament, quadratous lumborum and the aponeurotic origin of the trausversus abdominus muscle and to the perirenal fascia in front of the infero lateral part of the right kidney. (Warwick and Williams, 1973).

The right colic flexure (Hepatic flexure):

Compromises the terminal part of the ascending colon and the commencement of the transverse colon. It turns downwards, for wards and to the left. It is not covered by peritoneum on its posterior surface. The flexure is not so acute as the left colic flexure. (Warwick and Williams, 1973).

The Transverse colon:

About 50cm long, begins at the right colic flexure, placed in the right lumbar region, passes across the abdomen into the left hypochondriac region, and here curves sharply on itself, downwards and backwards, beneath the lateral end of the spleen, forming the left colic flexure (splenic flexure). The posterior surface of its right extremity is devoid of peritoneum, and is attached by areolar tissue to the front of the descending part of the duodenum and the head of the pancreas. The transverse colon is almost completely invested by peritoneum, and is connected to the anterior border of the body of pancreas by the transverse mesocolon. (Warwick and Williams, 1973).

The left colic flexure (Splenic flexure):

Is the junction of the transverse and descending parts of the colon in the left hypochondriac region. It lies at a higher level than, and on a plane posterior to, the right colic flexure, and is attached to the diaphragm, opposite the tenth and eleventh ribs, by the phrenicocolic ligament. (Warwick and Williams, 1973).

The descending colon:

About 25cm long, passes downwards through the left hypochondriac and lumbar regions, and ends in the sigmoid colon at the inlet of the lesser pelvis. The peritoneum covers its anterior surface and sides, while its posterior surface is connected by areolar tissue with the fascia over the lower and lateral part of the left kidney, the aponeurotic origion of the transversus abdominus, the quadratus lumborum, the iliacus and the psoas major muscles. (Warwick and Williams, 1973).

The descending colon in smaller in calibre, more deeply placed, and more frequently covered with peritoneum on its posterior surface, than the ascending colon. (Warwick and Williams, 1973).

The Sigmoid Colon (or Pelvic Colon):

Begins at the inlet of the lesser pelvis, where it is continuous with the descending colon. It is completely surrounded by peritoneum, which forms a mesentery (the sigmoid mesocolon).

The position and shape of the sigmoid colon vary very much and depend on:

(a) Its length.

(b) Length of its mesocolon.

(c) State of distension.

(d) Condition of the rectum and bladder. (Warwick and Williams, 1973).

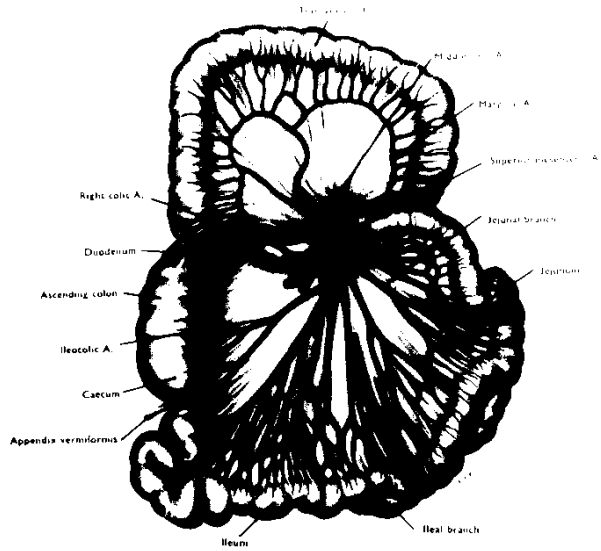

Fig (2): The superior mesenteric artery and its branches.
"Quoted from Cunningham's, 1977".

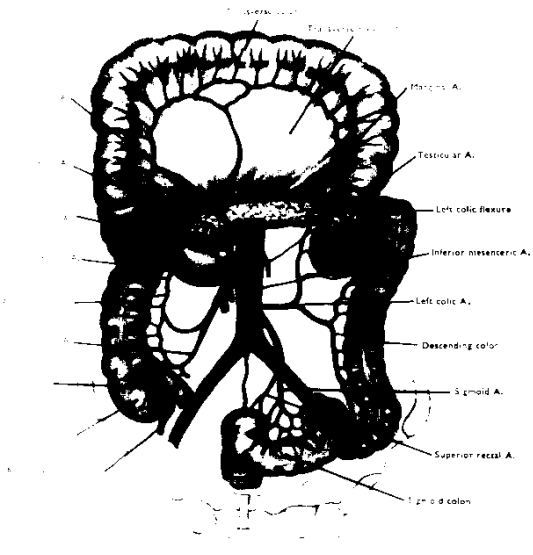

Fig (3): The branches of the superior and inferior mesenteric arteries to the large intestine.
"Quoted from Cunningham's, 1977".