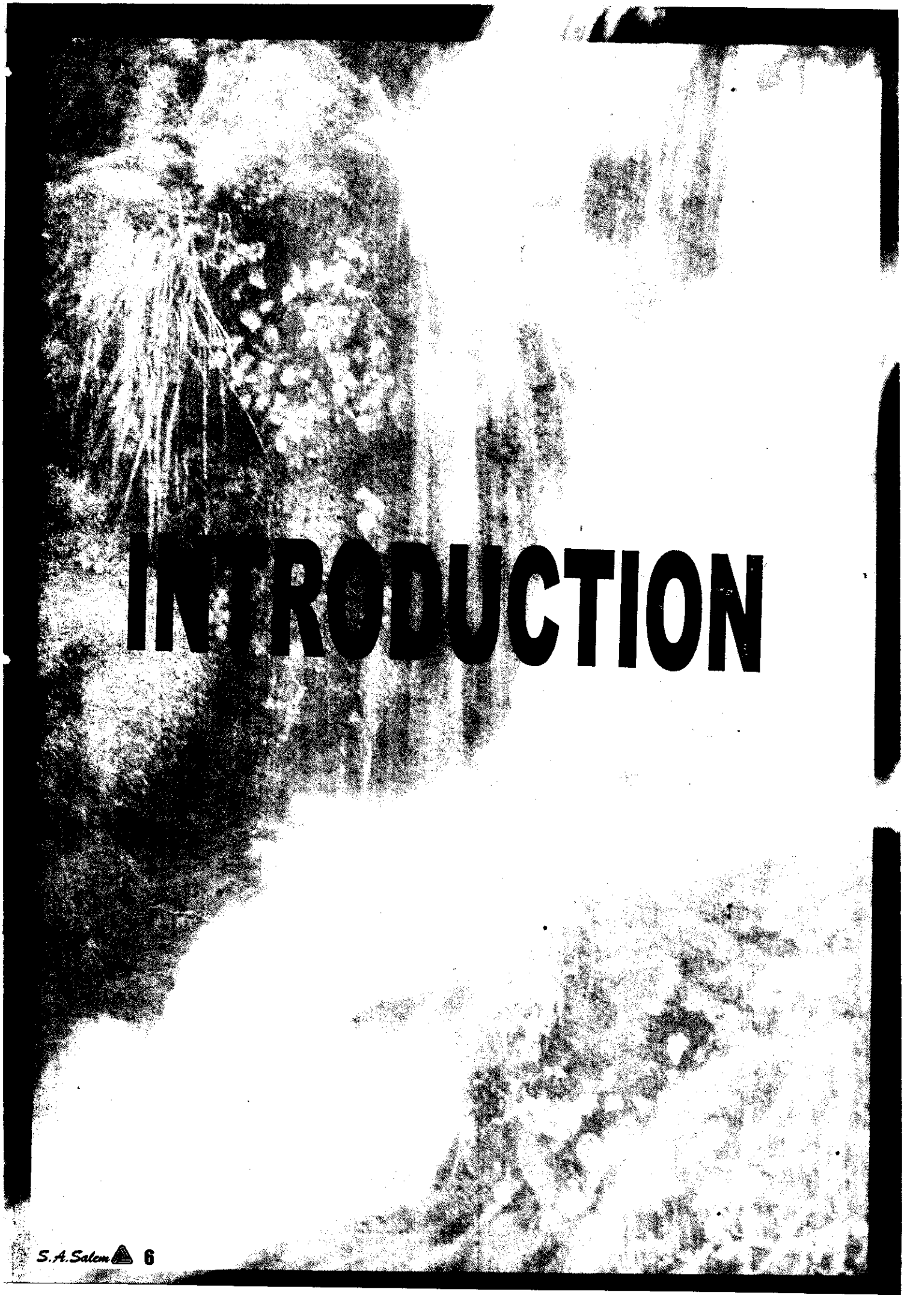

INTRODUCTION

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The number of patients presenting with clorectal carcinoma has increased in the last years, it is considered the second most common cause of cancer related deaths in men and the third most common in women *(Clarke et al., 1992).* Cancer of the rectum excluding the rectosigmoid junction represents approximately one-third of all large bowel malignancies *(Papillon, 1982).*

Clinical staging of rectal tumours by digital examination is correct in only 40% to 60% of patients *(Nicholls et al., 1982).*

Accurate pre-operative staging of rectal cancer is essential for the formulation of appropriate strategies for the management of individual patients. Staging techniques must be able to define accurately the extent of local disease. It must also be able to detect lymph node metastasis both in the perirectal tissues and on the side walls of the pelvis. Also must be able to detect distant metastasis elsewhere in the body *(Williams et al., 1985).*

Treatment for rectal neoplasms is based primarily on tumour stage. Although prompt surgical resection has traditionally been the treatment of choice for rectal tumours, superficial malignancies in the low to middle rectum may be more appropriately treated with transanal excision *(Horn et al., 1990).*

Transrectal ultrasonography appears to be the most accurate imaging technique for preoperative evaluation of rectal wall invasion and guides appropriate surgical intervention *(Grotz et al., 1991).*

Transrectal ultrasonography is highly accurate preoperative staging tool for rectal cancers and it is easy to perform, safe, and well toleratd by the patients *(Senagore et al., 1988).*

Transrectal ultrasonography has demonstrated a high degree of accuracy in the assesment of extent of local invasion of rectal carcinomas as well as the degree of regional lymphadenopathy *(Senagore, 1994).*

Preoperative ultrasonagraphic determination of the depth of invasion of rectal tumour enables the surgeon to devise a therapeutic plan to suit the individual patient's needs, one option may be local excision *(Heintz et al., 1990).*

Aim of the work :

The aim of this work is to evaluate the efficacy of transrectal ultrasonography in the diagnosis of colorectal pathology by comparing its result with the final pathological changes.

REVIEW OF LITERATURE

SURGICAL ANATOMY OF THE RECTUM

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The rectum is the part of he large intestine between the sigmoid colon and the and canal *(Gray et al., 1990).*

It begins at the rectosigmoid junction, infront of the third sacral vertebra and ends at the anorectal junction infront of the tip of coccyx *(Ger, 1988).*

The distinction is merely a matter of peritoneal attachment, where there is a mesocolon the gut is called sigmoid, where there is no mesentry it is called rectum *(McMinn, 1994).*

The rectum is about 15 cm length. It is narrowest at its junction with the sigmoid colon. Its widest part, the ampulla of the rectum, is located immediately above the pelvic diaphragm and is capable of considerabl distension. When the rectum is empty, its anterior and posterior walls are in contact *(O'Rahilly and Muller, 1986) (Fig. 1).*

The rectum proceeds downward and forwards, closely applied to the concavity of the sacrum and coccyx. It ends 2 to 3 cm infront and below the tip of the coccyx by turning abruptly downward and backwards through the levator ani muscle to become the anal canal almost 4 cm from the anal verge *(Mc Gregor's et al., 1986).*

The upper & lower ends of the rectum lie in the midline, but the ampulla is convex to the left, three lateral curves are thus produced each being marked on the interior of the ampulla by a horizontal shaft these are

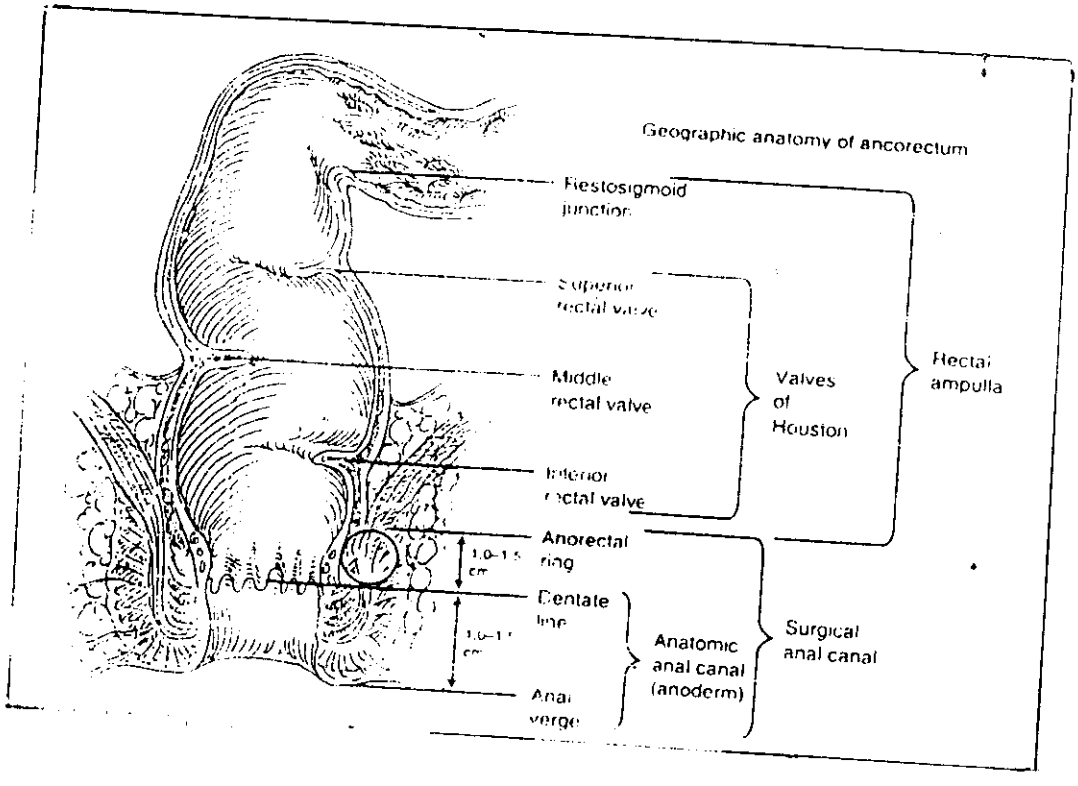

Fig. (1) Anatomic Landmarks of the anus and rectum

(Quoted from Maingot's., 1997).

named valves (The rectal valves of Houston), (Fig. 1) they lie two on the left & one on the right, between them. They produced by the circular muscle of the rectum & are not confined merely to this mucous membrane *(Last, 1990).*

Peritoneal reflections:

The upper third of the rectum is covered on its front and sides by peritonieum. The middle thirds is covered on the front only and the lower third is extra peritoneal (Fig. 2). From the middle third of the rectum, the peritoneum is reflected on to the seminal vesicle and bladder in the male and the posterior fornix of the vagina in the female creating rectovesical pouch in the male and the rectouterine pouch of Douglas in the female *(McGregors et al., 1986).*

The level of reflection in the male is usually about 7 to 8 cm above the anus, in the female it is bout 2 cm lower *(McMinn, 1994).*

Relations of the rectum:

The rectum is related posteriorly to the sacrum, coccyx, pelvic diaphragm and anteriorly in the male it is related to the rectovesical pouch containing some loops of small intestine separating the upper part of the rectum from the bladder, the lower part of rectum is related to the posterior aspect of the bladder to posterior surface of the prostate and on either side of prostate, to the seminal vesicles and the ductus deferens, in the female it is related anteriorly to the recto uterine pouch which contains loops of intestine, seperates the upper part of the rectum from uterus and upper part of the vagina, the lower part of the rectum below the reflection of peritoneum is related to the back of vagina *(O, Rahilly and Muller, 1986).*

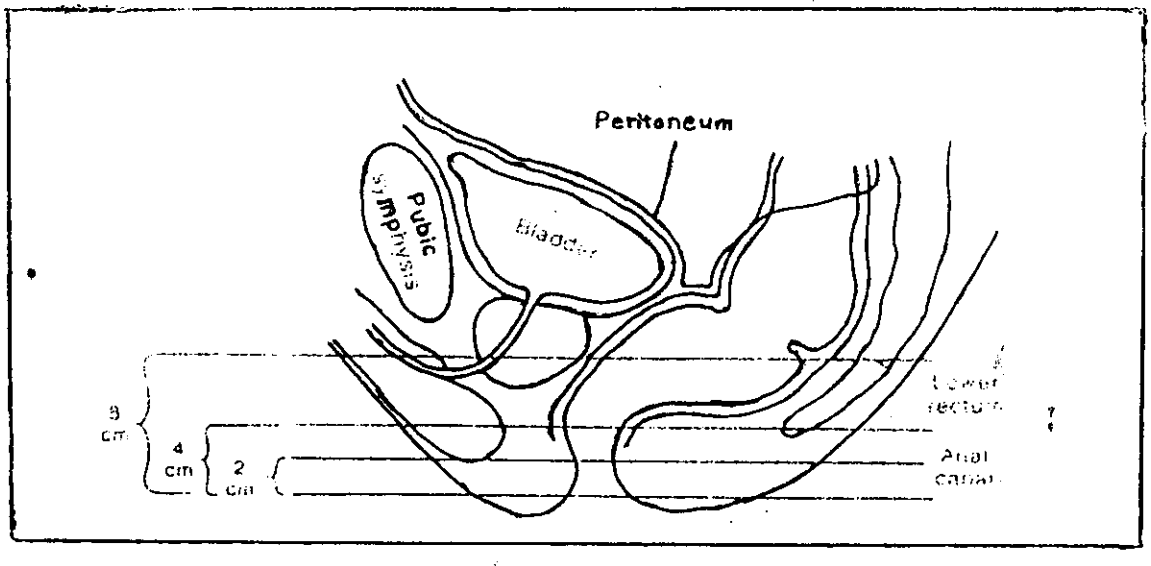

Fig. (2) The line of peritoneal reflection on the rectum, lateral view in the male. More of the rectum is covered anteriorly than posteriorhly. The measurements of the anal canal and lower rectum from the anal verge are approximate.

(Skandalakis., 1983)

Laterally, the ileum or sigmoid colon is related to the upper par of the rectum; the inferior hypogastric plexus of nerves and pelvic diaphragm

- are related to the lower part *(O'Rahillyand Muller, 1986).*

The supports of the rectum:

The rectum is supported all around by different fasciae and muscles. Most of them are important and have their reflection on the aetiology & treatment of certain diseases, these supports include:

1- Attachment of the puborectalis to the rectal wall as the puborectalis forms a sling around the junction of the rectum & anal canal.

2- The sacral curves which plays a definite role in the support of the rectum. In children where this curve is underdeveloped the rectum is less oncursed, facilitating rectal prolapse. This is supported by the usual successful non operative treatment of rectal prolapse in hildren where growing sacrum become more curved. Similarly in adults, the successful results of fixing the rectum in the sacral hollow *(Decker, 1986).*

3- The recto-urethralis muscle. This muscle attaches the rectum to the urogenital diaphragm & perineal body.

4- The lateral ligament or rectal stalk, this is a fibrous condensation which connects the parietal pelvic fascia on the pelvic side wall to the posterolateral aspect of the rectum. This important ligament should be ligated and cut during resection of the rectum *(Decker, 1986).*

5- The visceral layer of pelvic fascia is most probably not a significant factor in the support of the rectum.

6- The supporting adipose tissue of the pelvis ischiorectal fossae are claimed to have some role in rectal support.

Fasciae of the Rectum:

Lateral ligaments:

They are condensations of the areolar tissue around the middle rectal vessels *(McGregor, 1986)*. They are divided into lateral and medial portions according to relation to pelvic plexus. The former encloses middle rectal vessels and pelvic splanchnic nerves *(Sato and Sato, 1991)*.

Rectosacral Fascia:

A strong thick layer of parietal pelvic fascia adherent to the sacrum and coccyx which is known s fascia of Waldeyer, but it is preferred to be called recto – sacral fascia (Fig. 3) *(Crapp and Cuthbertson, 1974)*.

It suspends the lower part of the ampulla and fuses with the rectum at the anorectal junction enclosing the superior rectal vessels and lymphatics *(Last, 1984)*.

It is composed of two layers one lining the sacrum and fusing downwards with the other lining the rectum (Fascia propria of the rectum).

Fascia of Denonvillier:

A closely adherent layer of visceral pelvic fascia that extends from the anterior peritoneal reflection above to the superior layer of urogenital diaphragm below and laterally becomes continuous with the lateral ligaments of the rectum *(McGregor, 1986)*. Sometimes it is composed of two layers *(Goligher, 1984)*.

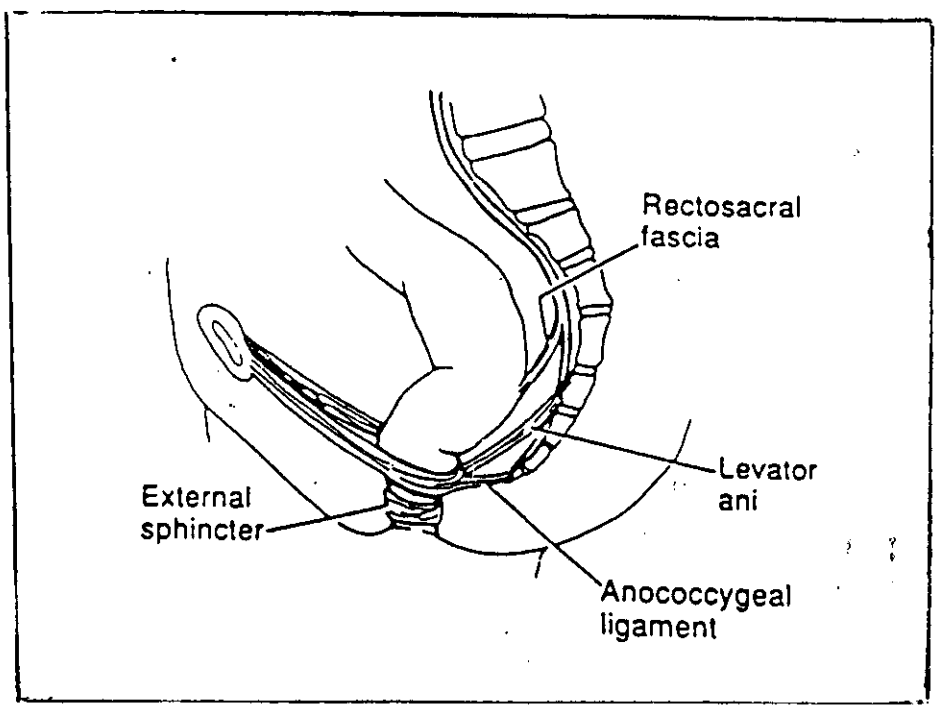

Fig. (3) : The rectosacral fascia

(Quoted from Smith, 1992).

Arterial supply of the rectum (Fig. 4) (A):

- Is derived principally from:

1- The superior rectal artery which is considered the main blood supply of rectum and anal canal, it is a continuation of the inferior mesenteric artery.

2- The middle rectal arteries supply the lower part of the rectum and the upper part of the analcanal, they arise from the internal iliac arteries.

3- The inferior rectal arteries divides into several branches and supply the lower part of the anal canal and the surrounding muscle and skin.

4- The median sacral artery which arises from the back of aorta about 1 cm above its bifurcation, it supplies the back of rectum *(Mc Minn, 1994).*

Venous Drainage of the rectum (Fig. 4) (B):

The veins of the rectum comprise the superior rectal which drains into the inferior mesenteric vein and portal system, and the middle and inferior rectal which enter the systemic circulation vai the internal iliac veins *(Goligher et al., 1984).*

Lymphatic Drainage of the rectum (Fig. 5):

These lymphatics follow the blood vessels supplying the rectum and there are three main routes of lymphatic drainage.

1- Lympatics of upper part of rectum follows the superior rectal vessels which empty at inferior mesentric nodes.

2- Lymphatic drainage of the middle and lower rectum also occurs along the middle rectal vessels terminating in internal iliac nodes.

3- The lowest part of the rectum and the upper part of the anal canal show a plexus that drains to lymphatics that accompany the inferior

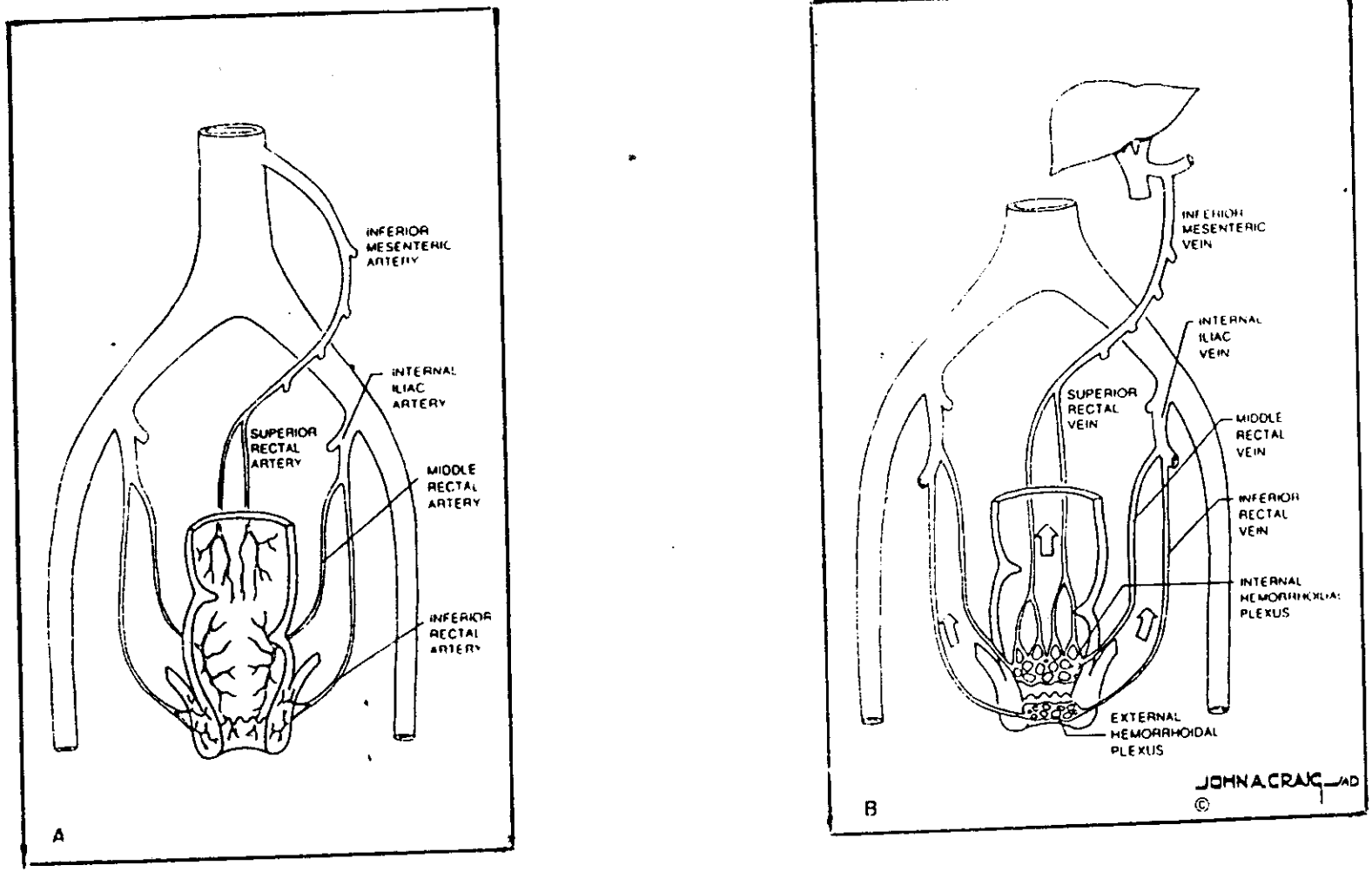

Fig. (4) : Vasculature of the anus and rectum.

A. Arterial supply

(Quoted. From Maingot's., 1997).

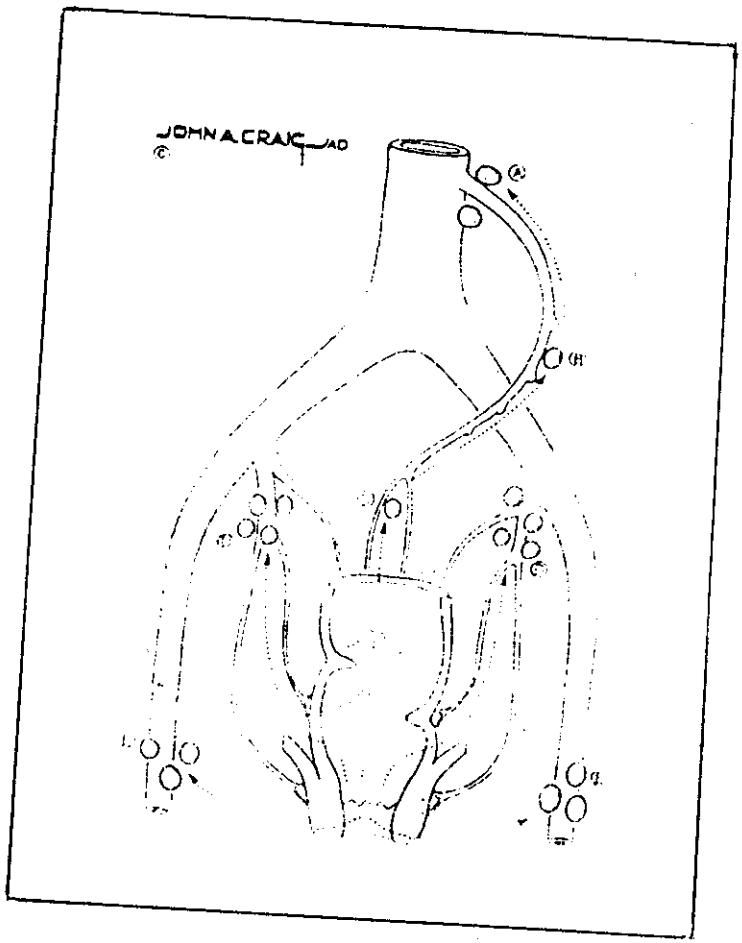

Fig. (5) Lymphatic drainage of the rectum and anus

A. nodes at origin of inferior mesenteric artery.

B. Nodes at origin of sigmoid branches.

C. Sacral nodes D. Internal iliac nodes E. Inguinal nodes.

(Quoted form Maingot's., 1997).

rectal and internal pudendal blood vessels and ultimately drain into the internal iliac nodes ***(Kodner, 1994).***

Nerve Supply of the Rectum:

The nerve supply of the rectum is derived from both parts of the autonomic system. The sympathetic supply is derived directly from the hypogastric plexus and fibres that accompany the inferior mesenteric and superior rectal arteries from the coeliac plexus ***(Last, 1984).***

The parasympathetic supply is derived from S2-3 or S3-4 by the nervi ergentis or sacral autonomics, which spring from the 2^{nd}, 3^{rd} and 4^{th} sacral nerves on either sides as they emerge from the anterior sacral foraminae and run in the base of lateral ligament and enter the rectum from the sides ***(Goligher, 1984).***