PATHO PHYSIOLOGY & MANAGEMENT OF FAECAL INCONTINENCE

ESSAY

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the Master Degree in
GRNERAL SURGERY

BY

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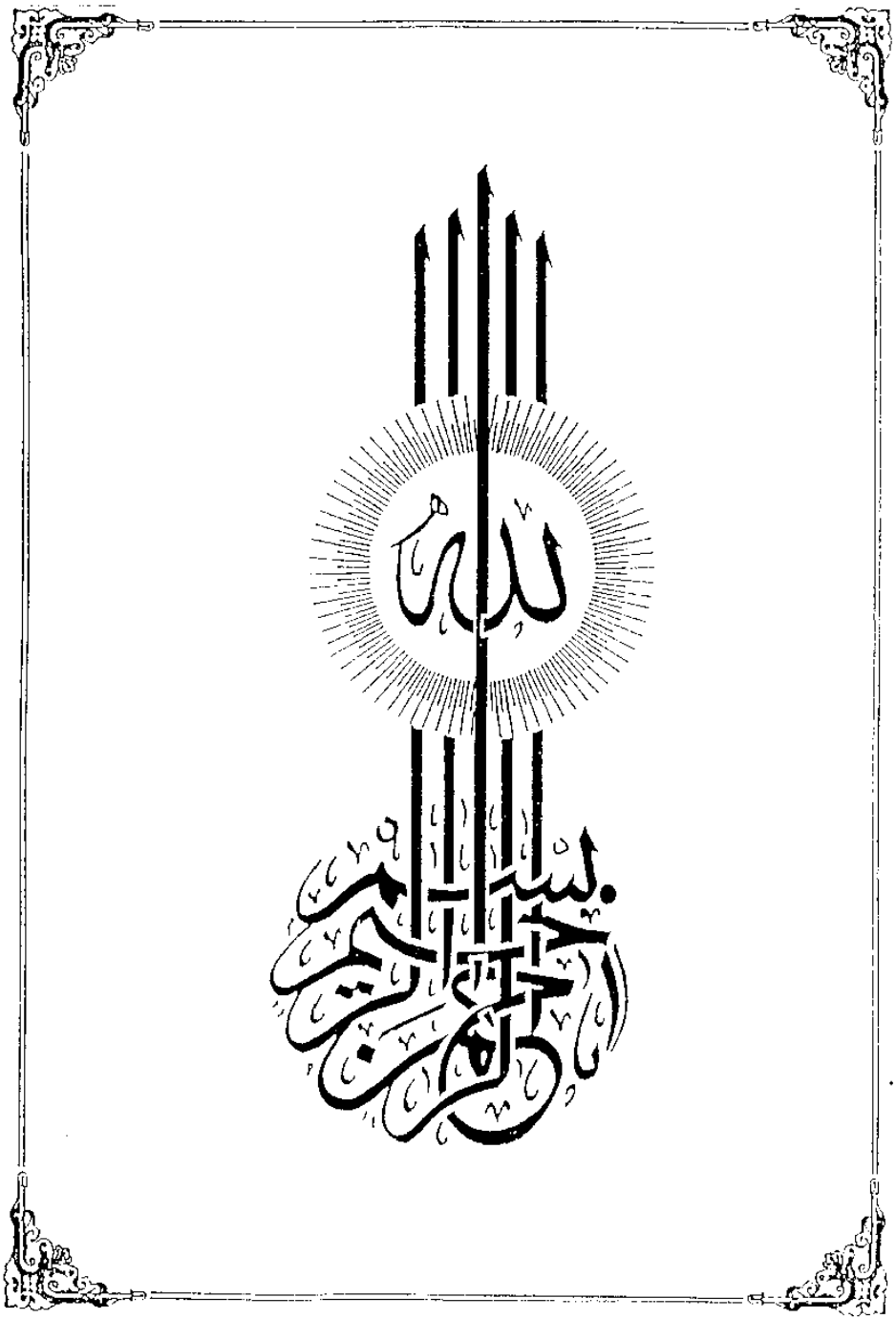
بسم الله الرحمن الرحيم

وقل رب زدني علمـــــــــــا

صدق الله العظيم



AKNOWLDEGMENT

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Pathophysiology and Managment of Faecal Incontinence.

SURGICAL ANATOMY

The Rectum:

The rectum commences where the taeniae coli fuse to form a continuous longitudinal muscle coat infront of the third sacral vertebrae as a continuation of the sigmoid colon.

It passes downwards, following the curve of the sacrum and coccyx, and ends 1 inch infront of the tip of the coccyx by piercing the pelvic diaphragm and becoming continuous with the anal canal.

* Peritoneal Relations :

The upper third of the rectum is surrounded by peritoneum, apart from small area posteriorly through which the mesorectum provides its blood supply from the superior heamorrhoidal vessels.

The middle third of the rectum is essentially retroperitoneal and is only covered anteriorly by peritoneum.

At this point the mesorectum becomes wider and the posterior rectum is entirely devoid of peritoneum, the rectum becomes completely infraperitoneal at the base of the recto-vesical or recto-uterine pouch.

Relations of the Rectum:

On account of the obliquity of the levator ani, the relations of the rectum as follows:

*** Lateral Relations:**

It is related to the pararectal space, pelvic diaphragm and to the apex of the ischio-rectal fossa. The pararectal space is formed by peritoneum above, the obturator internus and the side walls of the perlvis laterally, by the rectum medially and by the levator ani below. The ischoi-rectal fossa is roofed by the sloping levator ani above the ano-rectum, with the external and internal sphincters forming the medial boundary. The rectum also follows the curve of the sacral hollow in its lower two-thirds but at the level of the levator ani, where it enters the anal canal, it turns abruptly backwards and downwards. This anorectal angle, which is maintained by the pubo-rectalis sling, has in the past been regarded as an important mechanism in maintining continence.

*** The Posterior relations:**

The posterior relations of the rectum are the sacrum, the coccyx, the pubo-rectalis muscles and the middle sacral vessels. The sacral plexus and the autonomic nerve fibres in the pelvis, together with the pelvic lymphatics lie behind the upper rectum ***(Figure. 1).***

*** The Anterior Relations:**

This relations differ according to sex:

In Males: the extra-peritoneal rectum is related from below upwards to the prostate, seminal vesicles, vas and bladder ***(Figure. 2).***

In Females: The infra-peritoneal rectum lies immediately behind the posterior vaginal wall, above the peritoneal reflection the rectum is related to the upper vagina, with the uterus above, loops of small bowel, the ovaries, the fallopian tubes and the sigmoid colon frequently intervene anteriorly above the pouch of the douglas ***[Skandalakis, el al, 1983] (Figure. 3).***

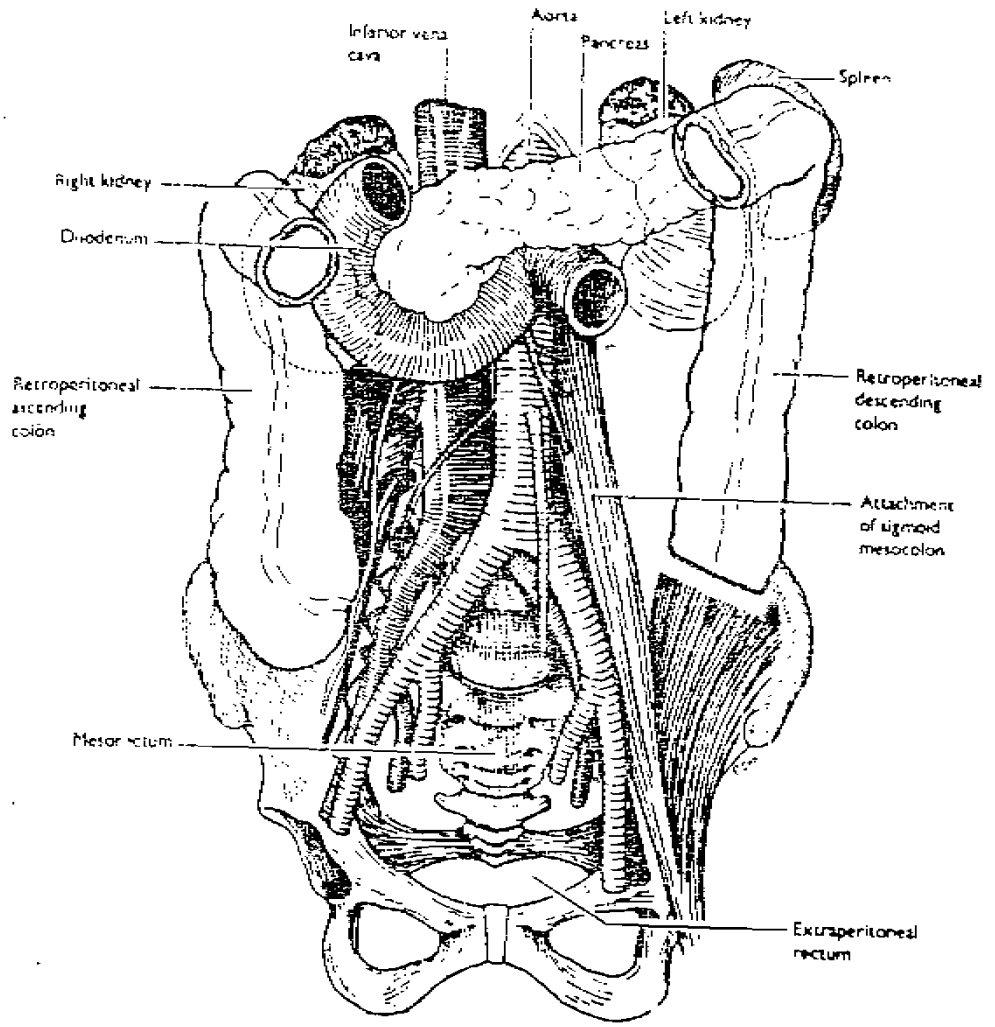

Figure (1) The posterior relations of the colon and rectum.

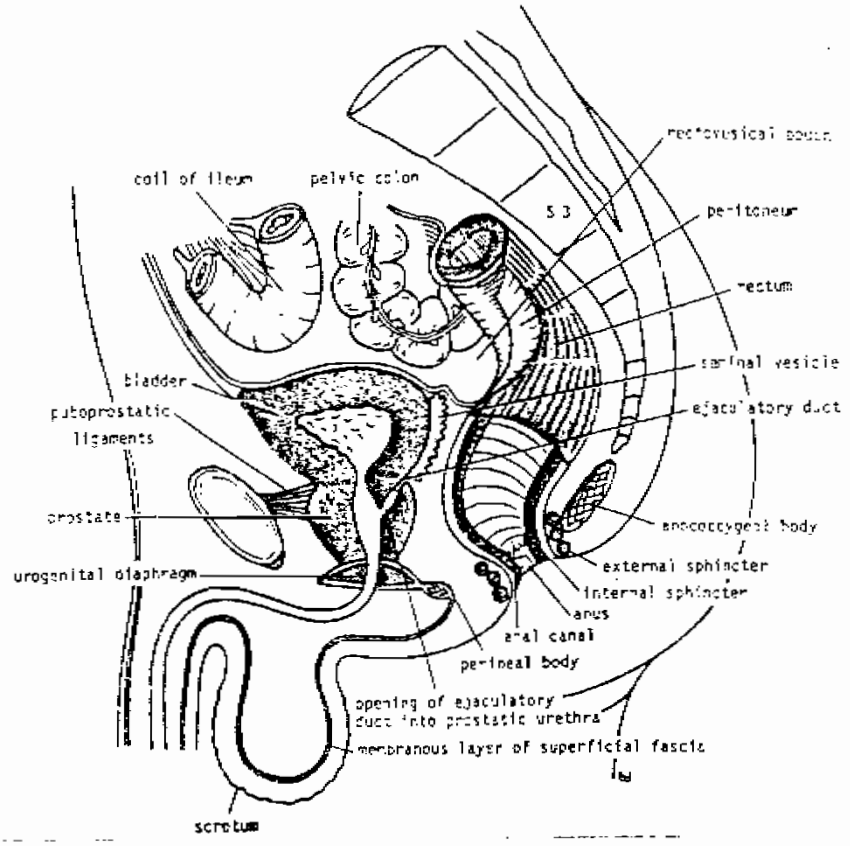

Figure (2) Sagittal section of the male pelvis.

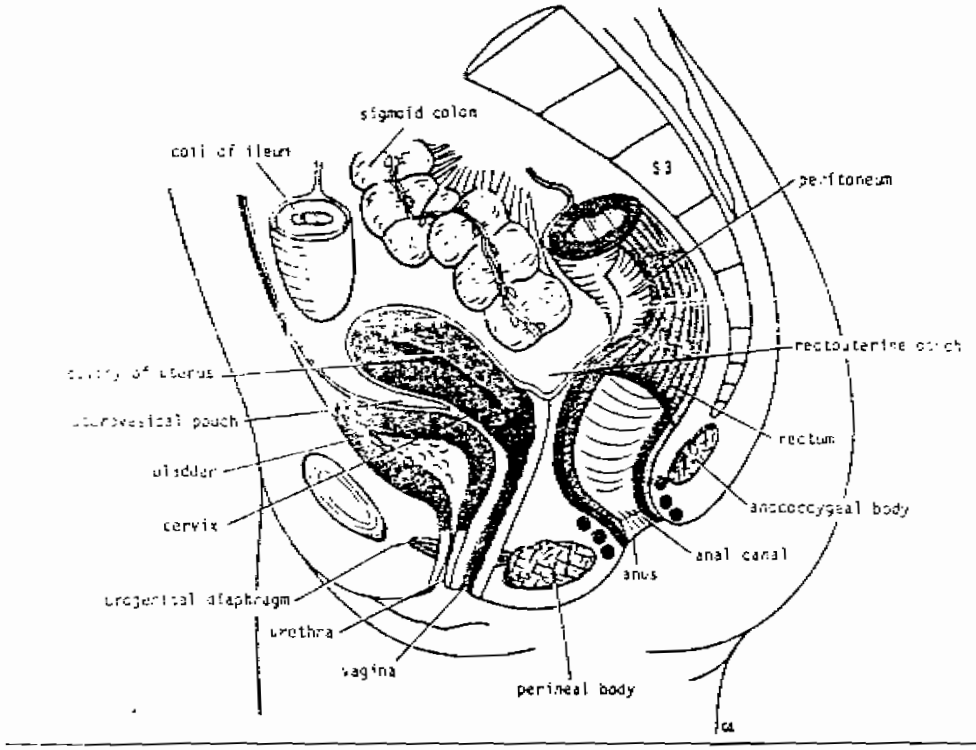

Figure (3) Sagittal section of the female pelvis.

Fascial attachment of the rectum:

The endopelvic fascia forms important relations with the rectum. These fascial components consist of condensations of fibrous tissue below the peritoneal reflection attached to the parietal pelvic fascia. There is a condensation of tissue arround the middle rectal artery forming the lateral ligaments.

Posteriorly there is a thickened area of parietal pelvic fascia over the sacrum and caccyx *(Waldeyer's fascia);* this must be divided during perineal and abdominal mobilization of the rectum. If this is not done correctly, the fascia may be stripped from the sacrum, resulting in damage to the presacral viens laying between the sacrum and the fascia, and to the *nervi irrigentes*, causing impotence in males.

Anteriorly the visceral pelvic fascia is expanded from the peritoneal reflection to the uro-genital traingle, where it is known as *Denonvillier*'s fascia, in the male it intervenes between the rectum and the prostate. In the female it is less prominent and divides the rectum from the vagina ***(Crapp et al , 1974)***

The Anal Canal:

The anal canal is 3-4 cm long, it commences at the ano-rectal angle and ends at the anal verge. Normally the anus is closed, posteriorly the anal canal is related to the coccyx, the pubo-rectalis and the sphincters. Laterally lies the ischio-rectal fossa with the inferior haemorrhoidal vessels and pudendal nerve in *Alcock's* canal.

Anteriorly the anal canal is related to the bulb of the urethera and the uro-genital traingle in the male and to the perineal body and vagina in the female ***(Nivat Vongs et al, 1981)***

The anal canal is lined by columnar (*Mucosal*) epithelium above the anal valves, and squamous epithelium *(Skin)* below. The dentate and pectinate lines are

synonymous and represent the site of the anal valves, which mark the muco-cutaneous junction. These valves are remnants of the proctodeal membrane separating the post allantoic hind-gut from the *proctodeum*. Above each anal valves is a pit, known as anal crypt or sinus formed by the orifices of the anal glands. These glands lie in the inter-sphincteric plane and help to lubricate the anal canal. The mucosa above the dentate line is thrown into a number of longitudinal columns, beneath which lies the internal haemorrhoidal plexus. The epithelium is loose above but becomes adherent to the internal sphincter at the anal valves via the mucosal suspensory ligaments of ***Parks***, for a distance of 0.5-2 cm above the anal valves the mucosa is cuboidal (not columnar), this is known as the anal transitional zone ***(Duthie and Bennette, 1963).***

This area is richly innervated with sensory nerve endings ***(Duthie and Gairns, 1960)***, below the anal valves the epithelium is squamous but devoid of hair, sebaceous and sweat glands only at the anal verge do the epithelium and subcutaneous tissue resemble those of normal skin ***(Figure. 4).***

The Sphincters:

The Internal anal sphineter:

Is merely a thickening of the circular fibres surrounding the gut, It is visceral in origin and consists of smooth muscle innervated by the pelvic autonomic plexus. The internal sphincter is 0.2 - 0.3 cm thick and surrounds the entire anal canal, extending at least 1 cm below it. The lower margin is quite distinct.

The external anal sphincter

Is somatic in origin and consists of skeletal muscles arranged circumferentially around the anal canal. Posteriorly the upper fibres of the external sphincter merge imperfectly with the inner fibres of the pubo-rectalis. Fibres of the

external sphincter surround the anal canal and are rarely, if ever, inserted into the *pubis* anteriorly or the *coccyx* behind. Although in fixed specimens the external sphincter may appear to descend lower in the anal canal than the internal sphincter, at the operation of internal sphincterotomy or ano rectal myectomy the internal sphincter is usually found to be the lower of the two.

Conventional anatomical texts describe three components to the external anal sphincter. Surgically, these are indistinguishable ***(Ayoub, 1979).*** ***Shafik (1975)*** and ***Handly (1978)*** describe the sphincters as being attached to the pubic symphysis or the coccyx. Where the fibres of the *levator ani* only are inserted into the bony structures of the pelvis. In the lower anal canal there is a longitudinal band (known by some as the longitudinal conjoined ligament) which fans out to form a number of septa. These extend radially through the lower fibres of the external sphincter to the perineal skin. These bands consist of longitudinal smooth muscle fibres and elastic tissue which are downwards extensions of the longitudinal fibres of the rectum.

The Levator Ani

The *levator ani* forms the pelvic diaphragm, separating the pelvis from the perineum. It consists of funnel arising from the sides of the pelvis through which the urethera, vagina and ano-rectum pass to enter the perineum. The *levator ani* is quite thin and the pelvic surface is covered by end- pelvic fascia, lymphatics and fat ***(Figure. 5).***

The *levator ani* consists of :

(1) Puborectalis:

Which arises from the *symphysis pubis*, these fibres surround the vagina (or prostate) and the ano-rectum, just above the sphincters, to be inserted into the opposite side of

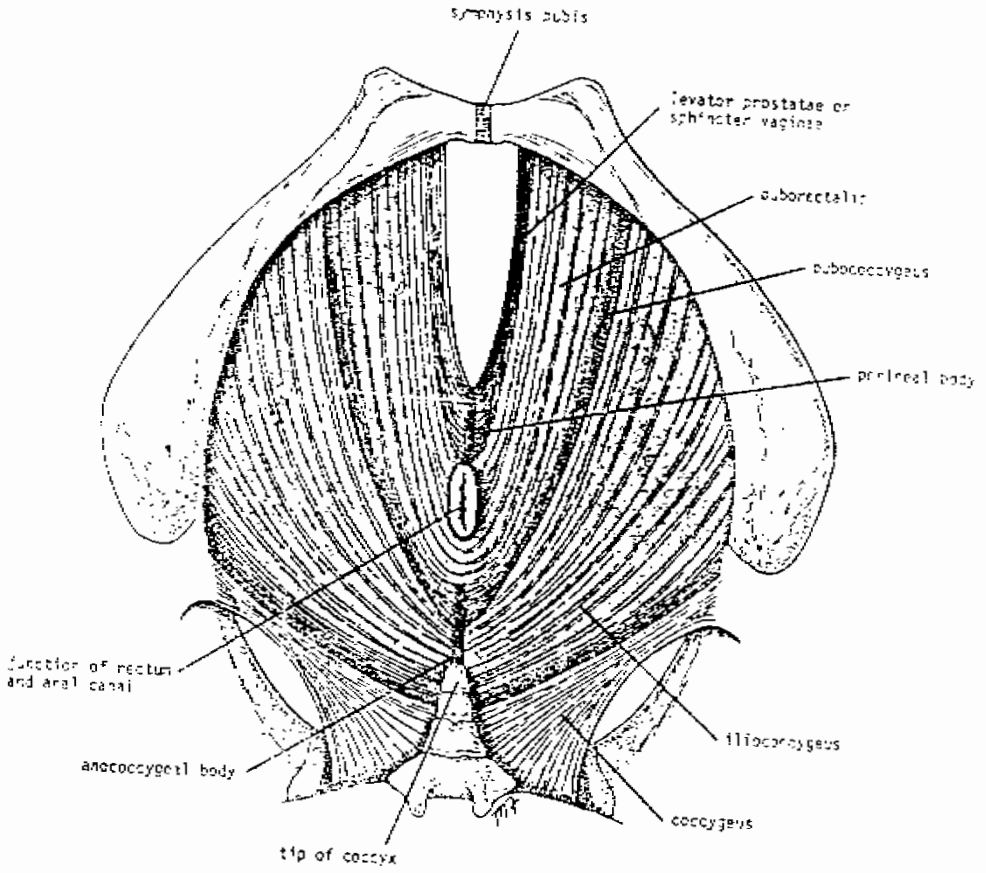

Figure (5) Apelvic view of the levator ani