PROLAPSE OF THE RECTUM

Essay

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بسم الله الرحمن الرحيم

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RECTAL PROLAPSE

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Rectal prolapse is an uncommon clinical entity that has long fascinated surgeons. It is a condition that was recognized in antiquity, having been described in The Ebers Papyrus of 1500 B.C. *(Mann, 1969)*.

It often occurs in persons in the extremes of life *(Corman, 1984)*. It is defined as the protrusion of one or more layers of rectum through the anal sphincter. If mucosa alone is involved, the prolapse is called incomplete if all layers of the rectal wall protrude, it is termed complete *(Thomson et al., 1981)*.

The terminology implies that incomplete rectal prolapse has the same causes and is merely an earlier stage of complete prolapse, but there are many reasons to doubt this assumption *(Thomson et al., 1981)*.

For years most surgeons ascribed to the belief that complete rectal prolapse was as sliding hernia, but in more recent years it has been refuted *(Theuerkauf et al., 1985)*.

It is probable that the principle abnormality in prolapse is an intussusception of the rectum and not weakness of the pelvic floor *(Keighley et al., 1983)*.

Internal intussusception is a distinct clinical entity that represents the precursor of complete prolapse. It is an early stage of the disease, occurring internally before the prolapsed bowel becomes externally *(Theuerkauf et al., 1985)*.

Rectal prolapse is a distressing condition, particularly when associated with faecal incontinence *(Keighley and Matheson, 1981)*.

The diagnosis is frequently missed in the young and in some subjects the prolapse is occult *(White et al., 1980)*.

Because many patients presenting with rectal prolapse are old and infirm, surgeons tend to favour low morbidity, local operations on the anal canal *(Goligher, 1984)*.

Such local procedures include the Thiersch wire, or a silastic sling around the anal canal *(Jackman et al., 1980)*.

Some advocate radical operations such as rectosigmoidectomy *(Porter, 1962)* or combined abdominoperineal pelvic floor repair for those patients who are fit to undergo major procedures (Roscoe Graham operation) *(Goligher, 1957; Hughes and Gleadell, 1962)*.

However, these operations have, in addition to their morbidity and mortality, a high recurrence rate *(Keighley et al., 1983)*.

Operations to cure rectal prolapse now simply mobilize the rectum and fix it to the sacrum or the symphysis pubis so that an intussusception cannot occur *(Keighley et al., 1983)*.

Patients suffering from faecal incontinence can undergo a post anal repair. Nevertheless, some cannot be helped, and then a colostomy is often the last management *(Thomson, 1986)*.

ANATOMY

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Anatomy of the Rectum

The Latin word "rectus" means straight, as if ruled. The rectum is misnamed, for it is curved in conformity with the hallow of the sacrum and, in addition, has a secondary bulge to the left of the midline *(Last, 1985)*.

The rectum is continuous with the sigmoid colon and there is no change of structure at the junction. Where there is a mesocolon, the gut is called sigmoid. Where there is no mesentery, it is called rectum *(Last, 1985)*.

No sphincter exists at the rectosigmoid junction *(Goligher, 1984)*.

The sacculations and appendices epiploicae present in the sigmoid are absent in the rectum *(Warwick and Williams, 1973)*.

The rectum starts at the level of the third sacral vertebra, and its end becomes continuous with the anal canal by passing through the pelvic diaphragm at the anorectal junction which is situated 2 to 3 cm in front of, and slightly below the tip of the coccyx *(Warwick and Williams, 1973)*.

In addition to its anteroposterior curve, the rectum deviates from the midline in the form of three curves; the upper and lower ones are convex to the right and the middle one (which is the most prominent) bulges to the left. Its beginning and end are in the median plane *(Warwick and Williams, 1973)*.

The angulation of the bowel on the concave side of each of these curves is accentuated by infoldings of the mucosa known as Houston's valves. The last named, which is also known as Kohlrausch's fold, is the most

prominent and is situated about the same level as the anterior peritoneal reflection. The part of the rectum below this level has a wider lumen and is known as the ampulla of the rectum *(Goligher, 1984).*

The Houston's valves lie across half the circumference of the rectal lumen and are produced by the circular muscle of the gut and the mucous membrane *(Last, 1985).*

The relation of the pelvic peritoneum to the rectum is of considerable surgical importance. The upper third or so of the rectum has a complete peritoneal investment except for a thin strip posteriorly where the peritoneum is reflected off it as the two leaves of the thick short mesorectum. As the rectum descends, the mesorectum becomes broader and shorter and the peritoneum sweeps off at the sides of the rectum until only the anterior aspect has a peritoneal coat which finally becomes reflected forwards at the bottom of the rectovesical or rectouterine pouch, leaving the lower third or so of the rectum without any peritoneal covering. in the upper rectum the peritoneum is closely applied to the underlying muscle coat, but this attachment becomes gradually looser lower down as a result of the interposition of a layer of fatty tissue. On the average, the anterior peritoneal reflection lies about 8-9 cm from the perineal skin in the male and 5-8 cm in the female. In women with complete rectal prolapse, the rectovaginal pouch is abnormally deep and actually protrudes into the rectum and through the anus into the prolapse *(Goligher, 1984).*

The fascia of the rectum consists of loose areolar tissue surrounding the rectal venous plexus. Posteriorly, a sheet of fascia, more membranous in character, suspends the lower part of the ampulla to the hollow of the sacrum: it encloses the superior rectal vessels. It is known as the fascia of Waldeyer.

Laterally, just above the pelvic floor, the middle rectal artery and the branches of the pelvic plexus are enclosed in a slight condensation of areolar tissue that is known to surgeon's as the lateral ligament of the rectum. The fascia of Waldeyer, the lateral ligaments, the pelvic peritoneum and the vessels and most of all the pelvic floor combine to hold the rectum stable in its position *(Last, 1985)*.

Anteriorly, the extraperitoneal part of the rectum is also covered with a layer of visceral pelvic fascia which extends from the anterior peritoneal reflection above to the superior fascia of the urogenital diaphragm (triangular ligament) below, and laterally becomes continuous with the front of the lateral ligament. It is known to surgeons as Denonvillier's fascia *(Goligher, 1984)*.

As regard the relations of the rectum, posteriorly the rectum is related to the lower three sacral vertebrae, the coccyx, the median sacral vessels, the piriformis, the anterior rami of the lower three sacral and coccygeal nerves, the sympathetic trunk, the ganglion impar, the lower lateral sacral vessels, and the coccygii and levators ani. While anteriorly, the relations differ in both sexes. In males, above the site of peritoneal reflection it is related to the upper parts of the base of the bladder and of the seminal vesicles and the rectovesical pouch and its contents; while below the peritoneal reflection, it is related to the seminal vesicles, the deferent ducts, the terminal parts of the ureters and the prostate. In females, above the peritoneal reflection, the uterus, the upper parts of the vagina and rectouterine pouch and its contents, while below the peritoneal reflection to the lower part of the vagina. Laterally, it is related to the pararectal fossa above the peritoneal reflection, while below it, to the pelvic sympathetic plexus, coccygei and levator ani and

branches of the superior rectal vessels constitute its immediate lateral relations *(Warwick and Williams, 1973)*.

As regard the blood supply of the rectum, it is derived principally from the inferior mesenteric artery, whose superior rectal branch divides into right and left branches, the right one divides into anterior and posterior branches. These three main branches sink into the muscle wall in the line of the three primary haemorrhoids (4, 7 and 11 O'clock). The muscle wall receives a reinforcement from the middle rectal branches of the internal iliac artery. Thirdly, some small twigs from the median sacral artery *(Last, 1985)*.

As regard the venous drainage of the rectum, it follows the arterial supply, with the distinctive difference that there is a very free anastomosis between the tributaries of the venous system. A submucous plexus of veins in the rectum and anal canal drains through the muscle wall of the ampulla into a plexus that surrounds the ampulla which is the external rectal plexus. It drains into two destinations; upward to the portal system by the superior rectal vein and across to the internal iliac vein by a plexus of middle rectal veins *(Last, 1985)*.

Lymphatics of the Rectum

According to *Jamaeison and Dobson, (1909)* and *Poirier et al., (1903)*, lymphatics of the rectum are considered as being in two closely connected groups i.e., the intramural and extramural lymphatics *(Goligher, 1934)*.

The intramural lymphatics are continuous lymphatic plexus in the submucosa and subserous layers of rectal wall which are connected and drain into the extramural lymphatics.

The extramural lymphatics follow the blood vessels supplying the rectum and anal canal, so there are three main routs:

1. Upward through the lymphatics and glands accompanying the superior haemorrhoidal and inferior mesenteric vessels essentially to the aortic nodes *(Goligher, 1984)*.

2. Laterally along the middle haemorrhoidal vessels on either sides to the internal iliac glands on the corresponding side wall of the pelvis *(Goligher, 1984)*.

3. Downwards through pararectal lymph node the back of the rectum and along lymphatic plexuses in the anal and perianal skin, the anal sphincters and ischiorectal fat to reach eventually the inguinal lymph nodes or the nodes along the internal iliac vessels *(Goligher, 1984)*.

Anatomy of the Anal Canal

The anal canal is some 3 cm long. Its junction with the rectum is at the pelvic floor. It is a right angled junction from which it passes downwards and backwards to the skin of the perineum *(Last, 1985)*.

It is related posteriorly to the coccyx. Laterally there is the ischiorectal fossa. Anteriorly in the male, to the central point of the perineum, the bulb of the urethra and the posterior border of the urogenital diaphragm containing the membranous urethra. In the female, it is related anteriorly to the perineal body and the lowest part of the posterior vaginal wall *(Goligher, 1984)*.

The anal canal is lined with mucous membrane in its upper two thirds and skin in its lower one third *(Last, 1985)*.

The junction of the two parts is marked by the line of the anal valves about 2 cm from the anal orifice. It is sometimes referred to as the pectinate or dentate line. Above each valve is a pocket known as an anal sinus. Above the pectinate line, the mucosa is thrown into 8-14 longitudinal folds known as columns of Morgagni, each being connected at the pectinate line by an anal valve *(Goligher, 1984).*

The arterial supply of the cloacal part is derived from the superior rectal artery, the lower third (skin) is supplied by the inferior rectal artery. These arteries do not anastomose with each other *(Last, 1985).*

The veins of the upper part drain upwards into the submucous plexus of the ampulla of the rectum. The veins of the skin part drain downwards into the inferior rectal veins or into tributaries of the saphenous vein. They do not communicate with the veins of the cloacal part. So between both parts, there is a venous watershed *(Last, 1985).*

The lymphatics of the cloacal part pass upwards from lymphatic follicles in the mucous membrane to join those of the rectum. Those of the skin part drain with the rest of the perineum into the medial group of superficial inguinal nodes *(Last, 1985).*

The nerves of the cloacal part are autonomic, from the inferior hypogastric plexus, and this part of the mucous membrane is relatively insensitive to touch though it registers pressure and it can distinguish between faeces and flatus. The nerves of the skin part are somatic, from the inferior rectal nerve and this skin is highly sensitive *(Last, 1985).*