ANATOMY Surgical anatomy

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The rectum begins where the tinea coli of the sigmoid colon join to form a continuous outer longitudinal muscle layer at the level of the sacral promontory . The rectum follows the curve of the sacrum and ends at the anorectal junction. The pubo- rectalis muscle encircles the posterior and lateral aspects of the junction, creating the anorectal angle (normally 120°). The rectum has three lateral curvatures; the upper and lower are convex to the right, and the middle is convex to the left. On the luminal aspect, these three curves are marked by semicircular folds (valves of Houston). The adult rectum is approximately 12–18 /uni00A0 cm in length and is conventionally divided into three equal parts: the upper third, which is mobile and has a peritoneal covering anteriorly and laterally; the middle third, where the peritoneum covers only the anterior and part of the la teral surfaces; and the low est third, which lies deep in the pelvis below the peritoneal reflection. The lower third of the rectum is separated by distinct fascial layers from the prostate/vagina anteriorly (Denonvilliers' fascia), and from the coccyx and lower two sacral vertebrae posteriorly (Walde yer's fascia) (Table 79.1). These fascial layers are surgically important as they act as barriers to malignant invasion and form the anatomical envelope for total mesorectal excision (TME) to achieve complete oncological clearance of rectal cancer. John Houston , 1802 − 1845, physician, City of Dublin Hospital and Lecturer in Surgery , Dub Charles-Pierre Denonvilliers , 1808 − 1872, Professor of Anatomy and later of Surgery , Paris, France. Heinrich W ilhelm Gottfried Waldeyer-Hartz , 1836 − 1921, Professor of Pathological Anatomy , Berlin, Germany . James Douglas , 1675–1742, Scottish anatomist and Physician Extraordinary to Queen Caroline. Summary box 79.1 Anatomy of the rectum /uni25CF /uni25CF /uni25CF /uni25CF - lin, Ireland.

To appreciate: That carcinoma of the rectum is common and can • present with symptoms similar to benign disease. Careful evaluation is required The principles involved in the management of rectal • pathologies The rectum measures approximately 15 /uni00A0 cm in length It is divided into lower, middle and upper thirds The blood supply consists of superior, middle and inferior rectal vessels The lymphatic drainage follows the blood supply. The principal route of drainage is upwards along the superior rectal vessels to the para-aortic nodes, although the lower rectum can drain to lymphatics along the internal iliac pedicle and lateral pelvic side walls TABLE 79.1 Anatomical relations of the rectum. Relation Anterior Bladder Seminal vesicles and prostate (males) Denonvilliers' fascia Pouch of Douglas and rectovaginal septum (females) Uterus and cervix (females) Ureters Lateral ligaments and middle rectal artery Lateral Obturator internus muscle and side wall of pelvis Pelvic autonomic plexus Levator ani muscle Sacrum and coccyx Posterior Waldeyer's fascial condensation Superior rectal artery and lymphatics Hypogastric nerves

The embryological hindgut forms the upper rectum, while the lower rectum is derived from the cloaca and is surrounded by extraperitoneal connective tissue. The primitive gut tube is suspended dorsally by a mesentery throughout its length, to form the mesorectum. The muscular layers of the rectum are derived from the mesenchyme that accompanies the endodermal part of the

anorectum, with the inner circular layer preceding the outer longitudinal layer in the seventh week of embryonic development. The levator ani muscles and external anal sphincter muscles form within the surrounding mesenchyme and grow to make contact with each other and with bundles of smooth muscle cells from the outer longitudinal layer of the r ectal wall. A layer of undi ff erentiated mesenchyme separates the rectal muscle layers from the levator ani muscle and the muscle layer of the future anal canal.

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