# The epithelium and subepithelial structures

The epithelium and subepithelial structures

The pink columnar epithelium lining the rectum extends through the anorectal ring into the upper anal canal. Passing downwards the columnar mucosa becomes a cuboidal ‘transi - tional zone’ characterised by 8–12 vertical columns separated by anal sinuses that form folds at their lower ends, the anal valves or crypts (of Morgagni). The r ow of alternating columns and crypts gives a serrated appearance known as the dentate line , which is considered to be the embryological junction between the endodermal and ectodermal parts of the anal canal (the proctodaeum) ( Figure 80.1 ). Below the dentate line the anoderm is lined by non-keratinised stratified squamous epithelium that is devoid of glands and hair but richly inner - vated by somatic sensory nerve endings (Wedel). Between the epithelial layer and the internal sphincter lies the submucosa, consisting of vascular, muscular and connec - tive tissue supportive elements. F rom the longitudinal muscle, medial extensions cross the internal anal sphincter and form part of the supporting meshwork of the submucosa, blending with the true submucosal smooth muscle layer supporting the mucosa itself, ter med the ‘mucosal suspensory ligament’. This separates the superior (portal) and inferior (systemic) haemor - rhoidal plexuses. Here the mucosa is more firmly tethered to underlying tissues than above. It is important to appreciate that the meshwork of supporting tissues (muscle fibres and connec - tive tissue) within the subepithelial space is intimately linked to deeper structures within the anal sphincter complex, including the internal sphincter, longitudinal muscle layer and external anal sphincter. With age, the smooth muscle component of this mesh is gradually re placed with fibroelastic connective tissue, which in turn becomes fragmented. The subepithelial space contains venous dilatations supported by the fibroelastic connective tissue and smooth muscle sca ff olding. Debate has centred on the nature of the vascular component of haemorrhoids. Thomson demonstrated that the divisions of the superior rectal artery were not constant and that the anal submucosa also receives a blood supply from the middle and inferior rectal arteries. In addition, there is free communication between tributaries of the superior, middle and inferior rectal veins, as well as direct arteriovenous communications with the submucosal venous dilatations. These communications have been shown both histologically and radiologically , and the oxygen tension of the blood contained within the venous dilatations is more arterial than venous. This explains the bright red colour of haemorrhoidal bleeding rather than the darker venous blood that might be expected.

---

Revision #1
Created 2025-12-31 15:29:24 UTC by Omar Ayman
Updated 2025-12-31 15:29:24 UTC by Omar Ayman