Hindgut Structures, Blood Supply and Innervation

The embryological hindgut gives rise to several structures including the distal 1/3 of the transverse colon, the descending colon, the sigmoid colon, and the rectum up to the pectinate line. The urogenital sinus is also derived from the embryological hindgut and later forms several urologic structures like the urethra, bladder, and prostate gland. In females, the urogenital sinus gives rise to the lower 2/3 of the vagina and several paravaginal and paraurethral glands. The hindgut is primarily supplied by the inferior mesenteric artery. These structures receive sympathetic innervation from the lumbar splanchnic nerves and parasympathetic innervation from the pelvic splanchnic nerves.

PLAY PICMONIC

Structures

Distal 1/3 of Transverse Colon

Disco-ball (1) Wand (3) Tree Train Colon

The hindgut begins at the distal 1/3 of the transverse colon. The transverse colon bows out anteriorly such that it is intraperitoneal whereas the ascending and descending colon are retroperitoneal.

Descending Colon

Falling Colon

The descending colon starts at the splenic flexure where the transverse colon ends. It is a retroperitoneal structure and continues as the sigmoid colon.

Sigmoid Colon

S-mud Colon

The sigmoid colon is highly variable across individuals. Sometimes it is short and straight, leading into the rectum. Other times, it is truly sigmoid or takes many turns in the pelvis before continuing onto the rectum.

Rectum

Rectangle

The hindgut ends at the upper rectum. Anatomically, this is marked by the pectinate line (a.k.a. dentate line), which is a line of transition from columnar epithelium to stratified squamous epithelium.

Pectinate (Dentate) Line

Pecs-of-tin-ape

The border between the upper and lower rectum and therefore the end of the hindgut, is marked by the pectinate line. The pectinate line is a line that can be visualized both grossly and on histology that represents an area of transition from columnar epithelium to stratified squamous epithelium.

Urogenital Sinus

Urinary-genital Street

The urogenital sinus is an embryological derivative of the hindgut. It forms from the cloaca, which the hindgut leads into. Later on in development, the cloaca disappears to leave the urethra as one opening and the anus as another. The urogenital sinus gives rise to the bladder and urethra. In males, it also gives rise to the prostate and bulbourethral glands while in females it gives rise to the lower 2/3 of the vagina, Bartholin glands, and urethral/paraurethral glands.

Vascular Supply

Inferior Mesenteric Artery

In-fur Mouse Archer

The hindgut is supplied by the inferior mesenteric artery (IMA), which is the last of the three gut-supplying arteries to branch off the aorta as it is tracked inferiorly.

Innervation

Lumbar Splanchnic Nerves

Lumber S-plank Nerve

The lumbar splanchnic nerves provide sympathetic innervation to the hindgut. They arise from L1-2 in the spinal cord, synapse in the inferior mesenteric ganglion, then go on to innervate hindgut structures.

Pelvic Splanchnic Nerves

Pelvis S-plank Nerve

The pelvic splanchnic nerves provide parasympathetic innervation to the hindgut. They arise from S2-4.