SUMMARY OF LEARNING POINTS

THE UPPER AND LOWER ANATOMICAL MARGINS OF THE RECTUM

Blue line: anorectal junction = anatomical junction between anal canal and distal rectum. Typically at the level of imaginary line between lower margin of sacral bone and pubic bone.

Pink line: Sigmoid take-off = anatomical transition between rectum and sigmoid. Can be recognized on MRI as the point where the sigmoid sweeps horizontally on sagittal view and ventrally on axial view (see images below).
The mesorectum contains:
- Rectum
- Mesorectal fat
- Blood- and lymphatic vessels
- Lymph nodes

The mesorectal fascia (MRF) lines the mesorectum. Anteriorly it ends at the level of the peritoneal reflection (red line). Above this level, the mesorectum is lined by the peritoneum anteriorly (dashed red line).

The mesorectal fascia can easily be recognized as a thin hypointense line on axial MRI (green arrows).

Schematic cross-sections of the upper, mid and distal rectum illustrating that the distal rectum is completely lined by the MRF, while the mid- and upper rectum are partially lined by the peritoneum (starting from the level of the anterior peritoneal reflection).
THE PELVIC FLOOR AND ANAL SPHINCTER

1 = internal anal sphincter
2 = external anal sphincter
3 = puborectal muscle
4 = levator ani muscle

THE RECTAL WALL

Typically the rectal wall has a two-layered appearance on MRI, consisting of an inner layer of mucosa (grey on MRI) and outer muscularis propria (black on MRI)

In case of submucosal edema, the rectal wall has a three-layered appearance on MRI, consisting of the mucosa (grey), submucosa (white) and muscularis propria (black)
**Note:**
Typically it is not possible on MRI to discern between T1 and T2 tumours, as MRI is not able to separately visualize the mucosa, submucosa and muscularis propria.

Anterior tumours above the level of the anterior peritoneal reflection have a potential risk for peritoneal invasion (i.e. T4a stage). Below this level, the mesorectum is not lined by the peritoneum anteriorly, but by the mesorectal fascia (N.B. MRF invasion without organ invasion indicates a T3 tumour).