Redefining MRI:
From Image to Insight

ICMRI 2026
THE 14th INTERNATIONAL CONGRESS ON MRI
& 31st ANNUAL SCIENTIFIC MEETING OF KSMRM

AUGUST 27 - 28, 2026
Grand Walkerhill Seoul, Seoul, Korea
https://icmri.ksmrm.org/2026m

KSMRM Educational Course 1

교육세션 1-3

Rectum

Jeongin Yoo

Seoul National University Hospital, Korea

Rectal MRI is central to local staging, treatment planning, and response assessment in rectal cancer. Its importance has grown with the broader use of neoadjuvant therapy, total neoadjuvant therapy, and organ-preservation strategies. Accordingly, MRI reporting must communicate not only the anatomic extent of the primary tumor but also imaging features that influence local recurrence risk, systemic disease risk, and multidisciplinary decision-making. This lecture presents a practical approach to rectal MRI acquisition and interpretation, based on the updated ESGAR recommendations.

A high-resolution 2D T2-weighted protocol forms the foundation of examination. Imaging should be performed at 1.5 T or 3 T with an external phased-array coil, a small field of view (16–18 cm), approximately 0.6 × 0.6 mm in-plane resolution, and 3-mm slices. Oblique axial images perpendicular to the tumor, together with appropriate coronal and sagittal images, are essential. Diffusion-weighted imaging is complementary rather than mandatory for baseline staging, but is particularly valuable for assessment after neoadjuvant treatment.

Interpretation should be structured and clinically oriented. Essential elements include tumor location; relationship to the sigmoid take-off and anterior peritoneal reflection; T category and depth of extramural spread; involvement of the anal sphincter complex or adjacent organs; and the relation of tumor to the mesorectal fascia (MRF) and anticipated circumferential resection margin. MRF involvement by primary tumor, extramural venous invasion (EMVI), or tumor deposits should be explicitly described. Nodal assessment should integrate size and morphology, while lateral pelvic lymph nodes require separate evaluation in low rectal cancer. EMVI and tumor deposits are important adverse prognostic features and should be reported even when their distinction is uncertain.

After neoadjuvant therapy, high-resolution T2-weighted and diffusion-weighted images are used to assess residual tumor, fibrosis, nodal status, and the MRF. The MRI tumor regression grade (mrTRG) categorizes response according to the relative proportions of residual tumor and fibrosis, supporting integration with clinical examination and endoscopy when considering clinical complete response and organ preservation. In summary, a standardized MRI protocol and structured report encompassing T and N stage, MRF and sphincter involvement, lateral pelvic nodes, EMVI, tumor deposits, and mrTRG provide the information required for individualized rectal cancer care.

Keywords: *Rectal cancer, MRI, Structured report, Neoadjuvant therapy*