## SUPPLEMENTARY MATERIALS

For the rectal MRI which was performed in our hospital, bisacodyl suppositories were administrated for bowel preparation 1 hour before. Thirty minutes before the MRI, 20 mg of scopolamine butylbromide was injected intravenously to alleviate colonic motility only in patients without contraindication for this drug. Immediately before MRI, approximately 100 mL of endorectal gel was applied. MRI was performed with the 3T or 1.5T system. The protocol included T2 weighted fast spin echo sequences with multiplanar images (coronal, sagittal with oblique axial image, which were angled perpendicular to the rectal lumen), and axial T1-weighted images with and without contrast enhancement. Detailed MRI parameters are described in Table 1.

### Patients' Treatment and Follow-Up

Except 12 patients who underwent neoadjuvant chemoradiotherapy at another hospital, 309 patients received neoadjuvant therapy in our hospital using a long course radiotherapy (RT) protocol which included pelvic irradiation of 45 Gy in 25 fractions followed by a boost of 5.4 Gy to the rectal mass in 3 fractions. Among 309 patients, 306 patients were given one of the following four chemotherapeutic regimens concurrently with RT: 1) intravenous bolus 5-fluorouracil (5-FU; 400 mg/m$^2$/day) and leucovorin (20 mg/m$^2$/day) (n = 31), 2) oral capecitabine (825 mg/m$^2$) (n = 137), 3) continuous 5-FU infusion (225 mg/m$^2$/day) (n = 133), and 4) folinic acid (leucovorin), 5-FU, oxaliplatin (eloxatin) (FOLFOX) regimen (n = 5). The remaining three patients received RT only. All 321 patients underwent subsequent surgery in our hospital by abdominoperineal resection (n = 25), low anterior resection (n = 187), ultra-low anterior resection (n = 106), transanal local excision (n = 1), and Hartmann's operation (n = 2). Adjuvant treatment was conducted on 269 patients (83.8%, 269/321) and most of them (n = 263) were treated without alteration of initial regimen; however, 6 patients were treated with multiple combinations of chemotherapeutic agents.

Surveillance for post-operative and post-treatment states was conducted by imaging follow-up and clinicians' recordings on electronic medical records. Survival information of the patients was analyzed by the national database in Statistics of Korea. Recurrence of disease was initially detected using imaging including CT, MRI, and positron emission tomography/CT, and was ultimately determined by the clinicians.

The pathologic tumor regression grading system proposed by Mandard et al. (25) was used: grade 1, complete regression-absence of residual cancer and fibrosis; grade 2, presence of rare residual cancer; grade 3, an increase in number of residual cancer cells, but predominantly fibrosis; grade 4, residual cancer outgrowing fibrosis; and grade 5, absence of regressive changes.

For Cohen's kappa analysis, kappa values were interpreted as follows: k value < 0.20, poor agreement; k value = 0.21–0.40, fair agreement; k value = 0.41–0.60, moderate agreement; k value = 0.61–0.80, good agreement; and k value = 0.81–1.00, very good agreement.

**Table 1. MRI Parameters for MR Sequences**

| Parameters | T1WI | CE T1WI (3T) | CE T1WI (1.5T) | T2WI | DWI* (3T) (b = 1000) | DWI* (1.5T) (b = 1000) |
|---|---|---|---|---|---|---|
| Repetition time (ms) | 500–750 | 3.0–3.1 | 400-700 | 2400-4600 | 2740–6250 | 6000–10000 |
| Echo time (ms) | 10–15 | 1.4–1.5 | 11–15 | 100–110 | 61–68 | 73–116 |
| Flip angle (degree) | 90 | 10 | 90 | 90 | 90 | 90 |
| Slice thickness (mm) | 4–6 | 3–4 | 5–8 | 3–6 | 3.5–5 | 5 |
| Slice spacing (mm) | 4.4–6 | 2–3 | 6–10.5 | 3–6 | 3.5–6 | 6 |
| Field of view (mm$^2$) | 240–250 x 240–250 | 380 x 380 | 240 x 240 | 240–250 x 240–250 | 250 x 250 | 300 x 300 |
| Matrix | 190–600 x 190–600 | 256 x 256 | 320 x 192 | 190–600 x 190–600 | 100–200 x 100–200 | 160 x 160 |

*DWI was analysed in high b value (b = 1000). CE = contrast-enhanced, DWI = diffusion-weighted imaging, T1WI = T1-weighted image, T2WI = T2-weighted image