LETTER TO THE EDITOR

Selection of Good Responders for Watch-and-wait Approach after Neoadjuvant Chemoradiotherapy for Locally Advanced Rectal Cancer: Tumour Regression Grade on Magnetic Resonance Imaging

To the Editor: We read with great interest the review article by Law[1] on the topic of a watch-and-wait approach for clinical complete responders after neoadjuvant chemoradiotherapy for rectal cancer. Evaluation of treatment response to neoadjuvant chemoradiotherapy in patients with locally advanced rectal cancers is important because it allows selection of poor responders for intensification of treatment, early surgery, surgery with extended planes, or palliative care. Conversely, treatment response evaluation also allows selection of good responders as candidates for organ preservation.

Pathological complete response (pCR) is a prognosticator associated with good overall survival (OS) and disease-free survival (DFS). However, determining whether pCR has been achieved can be obtained only after surgery, when histological assessments of specimens have been completed and the results are available. The selection of good responders for a watch-and-wait approach is therefore based on clinical assessment. In this letter, we would like to highlight the use of magnetic resonance imaging (MRI) in aiding the selection of good responders after neoadjuvant chemoradiotherapy.

The MRI scanning protocol for evaluation of response after neoadjuvant chemoradiotherapy is identical to the protocol for baseline evaluation.[2] Tumours regress primarily by fibrosis and this fibrotic reaction forms the basis for interpreting restaging MRI results, because high-resolution MRI allows the identification of post-treatment fibrotic tissue in tumours. A meta-analysis of 14 studies by Wu et al[3] showed a sensitivity of 64% and specificity of 88% for predicting pCR by assessing morphological T2-weighted MRI change. When combined with the use of diffusion-weighted imaging, there was a higher sensitivity, of 92%, but a lower specificity, of 75%, for predicting pCR.

Similar to the principle of pathological tumour regression grading originally described by Mandard et al,[4] a magnetic resonance tumour regression grade (mrTRG) classification system was developed by the MERCURY group of investigators.[5] In this grading system, the treatment response is classified into five categories (mrTRG 1-5) according to the degree of tumour replacement by fibrosis in the treated tumour on high-resolution T2-weighted MRI. The five categories are as follows: mrTRG 1, no radiological evidence of residual tumour; mrTRG 2, dense fibrosis without obvious tumour signal; mrTRG 3, mostly fibrosis with residual tumour signal; mrTRG 4, mostly residual tumour signal with fibrosis; and mrTRG 5, no fibrosis, or tumour progression.[5] This grading system has been validated in a prospective multicentre study conducted by the MERCURY group of investigators. They demonstrated a significant difference in the outcome between patients with favourable mrTRG (grades 1-3) and those with unfavourable mrTRG (grades 4-5). The 5-year OS and DFS rates were 72% and 64%, respectively, for favourable mrTRG and 27% and 31%, respectively, for unfavourable mrTRG.[6] A subanalysis showed that mrTRG 1-2, mrTRG 3, and mrTRG 4-5 corresponded to good, intermediate, and poor responses, with 3-year DFS rates of 82%, 72%, and 61%, respectively.[7]

According to a recent retrospective study of 191 patients,[8] mrTRG does not correlate well with pathological TRG. Nevertheless, mrTRG provides a non-invasive method for response assessment of the primary tumour and disease in the pelvis before surgery and has a strong correlation with clinical outcome. Thus, mrTRG should be regarded as an important factor in deciding treatment strategies after standard neoadjuvant chemoradiotherapy. Good responders (mrTRG 1-2) appear to behave similarly to pCR, and it can be used as one of the selection criteria for watch-

and-wait approach. With growing interest in the watch-and-wait approach, radiologists should be aware of this validated yet simple-to-use grading system in the evaluation of treatment response by restaging MRI.

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