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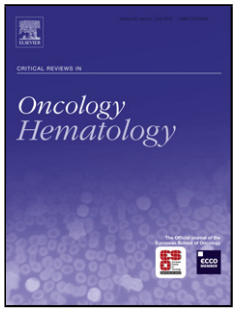

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ACCEPTED MANUSCRIPT

Imaging predictors of treatment outcomes in rectal cancer: an overview

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Abstract

The treatment protocols for rectal cancer continue to evolve, with increasing acceptance of a watch-and-wait policy for clinical complete responders to neoadjuvant chemoradiation therapy. It still, however, remains unclear who is likely to achieve a pathological complete response, which unequivocally portends a very favorable overall prognosis. Evolution of modern imaging techniques has paved the way for potential prediction of treatment response based on baseline, on-treatment, early post-treatment and subsequent follow-up imaging alone. Independent of tumor grade and stage, tumor marker levels, tumor size, radiation dose and fractionation, chemotherapy regimen, and extent/type of surgery, imaging biomarkers like circumferential resection margin (CRM), extramural venous space invasion (EMVI), imaging-based tumor regression grade, perfusion/diffusion-based functional imaging parameters, and imaging-based metabolic response have the ability to predict the likelihood of local recurrence and/or distant metastases. Textural features of images can add a further dimension to the predictive power of

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