

768 The Role of MRI Texture Analysis in Predicting Outcomes in Locally Advanced Rectal Cancer After Chemoradiotherapy

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Background: Locally advanced rectal cancer (LARC) is treated by neo-adjuvant chemoradiotherapy (NCRT) followed by surgery after restaging by magnetic resonance imaging (MRI). Texture analysis (TA) is a novel imaging biomarker that can assess heterogeneity in MRIs. This study hypothesizes that TA has the ability to predict the complete response (CR), survival, local recurrence, and distant metastasis.

Method: This is a retrospective analysis of all patients diagnosed with LARC who received NCRT and who have had MRI scans. Six parameters were systematically extracted from Textural histograms of post-treatment scans. Correlation between TA and CR was tested. These parameters were then examined to determine their ability in predicting local recurrence, distant metastases, and survival by means of Kaplan-Meier survival curves and log-rank tests.

Results: Four out of the six parameters extracted significantly identified CR. Utilising the same cut-off values across all parameters, three parameters significantly predicted local recurrence: Entropy ($p = 0.033$), mean of positive pixels (MPP) ($p = 0.045$), and Skewness ($p = 0.018$). Four parameters significantly predicted distant metastases: SD ($p = 0.015$), entropy ($p = 0.017$), MPP ($p = 0.005$), and skewness ($p < 0.001$). Four texture parameters significantly predicted survival: SD ($p = 0.002$), entropy ($p = 0.001$), MPP ($p < 0.001$), and skewness ($p = 0.017$).

Conclusions: MRI textural features are potentially significant imaging biomarkers in predicting survival, local recurrence, or liver metastases in LARC.