ABSTRACT

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Radiomics for precision medicine in glioblastoma.

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INTRODUCTION: Being the most common primary brain tumor, glioblastoma presents as an extremely challenging malignancy to treat with dismal outcomes despite treatment. Varying molecular epidemiology of glioblastoma between patients and intra-tumoral heterogeneity explains the failure of current one-size-fits-all treatment modalities. Radiomics uses machine learning to identify salient features of the tumor on brain imaging and promises patient-specific management in glioblastoma patients.

METHODS: We performed a comprehensive review of the available literature on studies investigating the role of radiomics and radiogenomics models for the diagnosis, stratification, prognostication as well as treatment planning and monitoring of glioblastoma.

RESULTS: Classifiers based on a combination of various MRI sequences, genetic information and clinical data can predict non-invasive tumor diagnosis, overall survival and treatment response with reasonable accuracy. However, the use of radiomics for glioblastoma treatment remains in infancy as larger sample sizes, standardized image acquisition and data extraction techniques are needed to develop machine learning models that can be translated effectively into clinical practice.

CONCLUSION: Radiomics has the potential to transform the scope of glioblastoma management through personalized medicine.

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