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Letter to the editor

[^{18}F] PARPi-PET in locally advanced oral cavity carcinoma

Treatment of locally advanced oral cavity carcinoma (OCC) generally includes surgical resection followed by adjuvant radiotherapy (RT) [1]. Adjuvant concurrent chemoradiotherapy (CRT) is usually required in case of extranodal extension and/or positive surgical margins [1]. In this setting, post-treatment evaluation of loco-regional status becomes difficult to visualize on clinical exam due to tissue distortion from prior surgery and flap reconstruction and RT-related effects on healthy tissues. Follow-up imaging recommendations indicate to repeat pre-treatment baseline imaging within 3 months of adjuvant therapy [1]. Discrimination of treatment injury from recurrent tumor represents still a major clinical need [2–4]. Recently, several reports on human cancers have suggested that positron emission tomography (PET) using fluorine-18 poly adenosine diphosphate ribose polymerase ([^{18}F]PARP) tracer can discern these entities [5]. PARP is nuclear enzyme complex physiologically involved in DNA repair and transcription regulation. These enzymes are activated after single-strand breaks (SSBs) DNA – base excision, nucleotide excision and mismatch excision – and double-strand breaks (DSBs) DNA – non-homologous end-joining and homologous recombination – [5]. Based on the strong molecular rationale that tumor cells are more subjected to DNA damage than normal cells, PARP should be over-expressed in malignant tissue. Consequently, selective PARP marker can potentially optimize the differential diagnosis of local recurrence from healthy tissues.

Actually, clinical data regarding the use of [^{18}F]PARP-PET in OCC are very limited and a comprehensive evidence-based analysis is needed to better clarify the quantitative relationship between PARP expression and treatment outcomes. At this time, [^{18}F]PARP-PET data are restricted to pre-clinical studies, in which the [^{18}F]PARP tracer resulted in promising results to resolve the common “recurrence/treatment injury” dilemma [6,7].

Today, parameters for follow-up stratification should be considered paramount to significantly improve management algorithm in locally advanced OCC patients. The purpose of this editorial is a logical step forward molecular imaging to yield [^{18}F]PARP-PET as a reproducible measure to differentiate cancer and healthy tissue into OCC clinical practice.

Declaration of Competing Interest

None declared.

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