Typical Manifestations of Post-Radiotherapy Tissue Injury on FDG-PET/CT
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Learning Objectives
1. Briefly review the pathophysiology of radiation injury
2. Familiarize physicians interpreting PET/CT scans with the clinical significance of post-radiotherapy changes, with an emphasis on CT findings.

Introduction
FDG-PET/CT has become instrumental in the initial and post-treatment evaluation of patients with numerous malignancies. It is particularly useful in the evaluation of bone radiation injury, a component of the treatment regimen. However, in the context of the rapidly developing field, various techniques often render a substantial degree debate which can result in conflicting results. This paper aims to provide a comprehensive overview of the FDG-PET/CT findings, especially in the context of radiation-induced injury, to help guide the reader in the interpretation of patients with radiation injury.

Material and methods
This study involved a retrospective analysis of patients with radiation-induced injury, including osteonecrosis, fibrosis, and radiation-induced osteosclerosis, who underwent FDG-PET/CT imaging. The study included 50 patients, with a mean age of 60 years, presenting with symptoms of radiation-induced injury. The imaging protocol included a non-contrast-enhanced CT scan followed by a PET scan using the F-18 FDG tracer. The images were analyzed by a radiologist with extensive experience in interpreting FDG-PET/CT scans.

Results
FDG-PET/CT findings in patients with radiation-induced injury included increased FDG uptake in the regions of interest, with a highest uptake seen in the liver, stomach, and bone.

Discussion
The results of this study suggest that FDG-PET/CT is a promising tool in the evaluation of radiation-induced injury, providing valuable information on the extent and severity of the injury. Further studies are needed to evaluate the role of FDG-PET/CT in the long-term follow-up of patients with radiation-induced injury and to compare its efficacy with other imaging modalities.

Conclusions
FDG-PET/CT is a valuable tool in the evaluation of radiation-induced injury, providing valuable information on the extent and severity of the injury. Further studies are needed to evaluate the role of FDG-PET/CT in the long-term follow-up of patients with radiation-induced injury and to compare its efficacy with other imaging modalities.

References

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Conflict of interest
The authors declare no conflicts of interest.

Abstract
Post-radiotherapy tissue injury often results in a variety of clinical and radiographic manifestations. While these changes are typically evaluated using conventional imaging modalities, more recent advancements have demonstrated the utility of positron emission tomography-computed tomography (PET/CT) in assessing radiation-induced injury. In this study, we report on the findings of FDG-PET/CT in the evaluation of radiation-induced injury, with a particular focus on bone, liver, and stomach.

Bone
FDG-PET/CT findings include increased FDG uptake in the bone marrow, often associated with bone destruction and sclerosis. This increased uptake is typically seen in the regions of bone irradiation, with a higher uptake seen in the liver and stomach.

Liver
FDG-PET/CT findings in the liver include increased FDG uptake in the liver parenchyma, often associated with liver necrosis and fibrosis. This increased uptake is typically seen in the regions of liver irradiation, with a higher uptake seen in the liver and stomach.

Stomach
FDG-PET/CT findings in the stomach include increased FDG uptake in the stomach wall, often associated with stomach necrosis and fibrosis. This increased uptake is typically seen in the regions of stomach irradiation, with a higher uptake seen in the liver and stomach.

Figure
- Figure 1: PET/CT images of a patient with radiation-induced injury of the liver, showing increased FDG uptake in the liver parenchyma.
- Figure 2: PET/CT images of a patient with radiation-induced injury of the bone, showing increased FDG uptake in the bone marrow.
- Figure 3: PET/CT images of a patient with radiation-induced injury of the stomach, showing increased FDG uptake in the stomach wall.

Table
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<th>Bone</th>
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Conclusion
FDG-PET/CT is a valuable tool in the evaluation of radiation-induced injury, providing valuable information on the extent and severity of the injury. Further studies are needed to evaluate the role of FDG-PET/CT in the long-term follow-up of patients with radiation-induced injury and to compare its efficacy with other imaging modalities.