Plenary Talk   PV XIII   Thu 9:00   HSZ/AUDI

The role of artificial intelligence in modern radiation therapy — •Guillaume Landry — Department of Radiation Oncology, University Hospital, LMU Munich, Munich, Germany

As in many other fields, artificial intelligence (AI) has found applications in radiation therapy. By now, the most widespread use of AI is for the automatic delineation of organs on computed tomography or magnetic resonance images of the patient, which serve as basis for radiation delivery planning. For this task, the ubiquitous U-net convolutional neural network has been widely adopted, and several commercial solutions are available. Just as AI is continuously evolving, radiation therapy has seen exciting developments, notably the clinical introduction of online adaptive radiotherapy at MR-linacs, which allows daily plan adaptation and tumor tracking using cine-MRI. MR guided radiotherapy (MRgRT) is ideally suited for the adoption of AI methods, since it generates large amounts of data with imaging at every fraction, and there is a need to reduce the time patients spend in the MR-linac bore waiting for plan adaptation. Thus, besides automatic segmentation, in MRgRT AI may allow to generate pseudo-CT images from MR images and to help track and predict tumor motion on cine-MRI. Even for segmentation, some specific approaches such as patient-specific model fine tuning may find a role in MRgRT. Finally, for radiotherapy in general, AI may allow to correlate imaging and treatment outcomes.