Radiotherapy Targeting Software For More Accurate Prostate Cancer Treatment

[2023-124]

Digital Imaging - Oncology

> TRL 3
> Preclinical

Problem

Cancer is a leading cause of mortality, accounting for one in every five deaths worldwide. Globally, about 1 in 8 men will be diagnosed with prostate cancer during their lifetime.

Patients with locally advanced prostate cancer require the prostate and lymph nodes to be irradiated simultaneously during radiotherapy (require multi-target treatment).

Accurate patient positioning before each fraction is crucial in radiotherapy treatment to ensure that maximum dose reaches the planning target volume (PTV) while minimising radiation exposure to organs at risk (OAR). However, the relative motion between treatment targets decreases the correct targeting thereby reducing the treatment accuracy.

Solution

Because the motion of prostate (~15 mm) is largely uncorrelated with the pelvic nodes (fixed to vasculature), during radiation treatment, usually the prostate is prioritised with the lymph nodes usually received less dosage (up to 25% with 15 mm displacements). This means there is a chance of cancer metastasis. Further, the pelvic rotations can introduce further setup errors. Thus, multi-organ targeting is not possible.

This technology is a software method to monitor the pelvic bone motion in six degrees of freedom that has the potential to enable multi-target motion monitoring during radiation treatment allowing for adjustment of radiation delivery to improve patient outcome.

Intellectual Property Status

US Patent application no. 18/757,718 and AU patent application no. 2024204505 have been filed.

Potential Commercial Applications

- Integration with standard hardware imaging/therapy systems
- Software product with AI-related enhancements to improve accuracy
- Precision radiotherapy for prostate cancer

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