

Sensitivity of the gamma index evaluation in the context of bone SBRT

Background

Stereotactic body radiation therapy (SBRT) rises as an effective technique to improve oncological outcome in oligometastatic patients [1-3]. In bone metastasis management, the possibility to deliver high dose per fraction with extreme precision shows excellent response in terms of local control [4-6]. There are international guidelines for target delineation based on some patterns of failure in bones metastasis data and expert consensus [7-8]. These recommendations often support the addition of a large part of adjacent “normal appearing” bone spaces leading to potential dose prescription compromises [9-11].

The delivery of these treatments is complex, with quality assurance measures in place to ensure it is delivered accurately. Patient-specific quality assurance (PSQA) is commonly used to examine the quality of intensity modulated treatment plans, but their ability to detect clinically significant problems is unclear. External audits have found problems with delivered radiation doses despite internal PSQA giving the green light, raising questions about the sensitivity of clinical PSQA procedures [12].

Goals

The purpose of this work is to analyze the sensitivity of the PSQA procedure using the common gamma index evaluation in the context of bone SBRT. The work will contain:

- Recalculation of already delivered plans with known modifications
- Measurement of original and modified plans with standard PSQA tool
- Comparison with advanced PSQA tool (if tool available at the time)
- Correlation with local control and/or survival (if clinical data available at the time)

Period

4 months - 1 year

Supervisors

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References

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