

Resource Summary Report

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Repeat multiparametric MRI in prostate cancer patients on active surveillance

DOI:10.17504/protocols.io.j5jcq4n

Type: Protocol

Proper Citation

Juho Eineluoto, Petrus Järvinen, Anu Kenttämies, Tuomas Kilpeläinen, Hanna Vasarainen, Kevin Sandeman, Andrew Erickson, Tuomas Mirtti, Antti Rannikko 2017.
Repeat multiparametric MRI in prostate cancer patients on active surveillance. protocols.io
dx.doi.org/10.17504/protocols.io.j5jcq4n

Protocol Information

URL: <https://dx.doi.org/10.17504/protocols.io.j5jcq4n>

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Summary: Introduction: This study was conducted to describe the repeat multiparametric MRI (mpMRI) changes occurring in prostate cancer (PCa) patients during active surveillance (AS), and to study possible associations between mpMRI-related parameters in predicting prostate biopsy (Bx) Gleason score (GS) upgrading >3+3 (GU) and protocol-based treatment change (TC). Materials and methods: The study cohort consisted of 76 AS patients with GS 3+3 PCa and at least two consecutive mpMRIs of the prostate performed between 2006 and 2015. Patients were followed according to the Prostate Cancer Research International Active Surveillance (PRIAS) protocol and additional mpMRIs. The primary end points were GS upgrading (GU) (>3+3) in protocol-based biopsies and protocol-based TC. Results: 53/76 (69%) patients had progression (PIRADS upgrade, size increase or new lesion[s]), 18/76 (24%) had radiologically stable disease, and 5/76 (7%) had regression (PIRADS or size decrease, disappearance of lesion[s]) in repeat mpMRIs during AS. PIRADS scores 4 to 5 in the initial mpMRI was associated with GU ($p=0.008$) and protocol-based TC ($p=0.009$). Tumour progression on repeat mpMRIs was associated with TC ($p=0.045$) but not with GU ($p=1.00$). PIRADS scores 4-5 predict GU (sensitivity 0.80 [95% confidence interval (CI); 0.51-0.95, specificity 0.62 [95% CI; 0.52-0.77]) with PPV and NPV values of 0.34 (95% CI; 0.21-0.55) and 0.93 (95% CI; 0.80-0.98), respectively. Conclusion: mpMRI is a useful tool not only to select but also to monitor PCa patients on AS.

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Version: 1

Publication Date: 2017

Proper Citation: Juho Eineluoto, Petrus Järvinen, Anu Kenttämies, Tuomas Kilpeläinen, Hanna Vasarainen, Kevin Sandeman, Andrew Erickson, Tuomas Mirtti, Antti Rannikko 2017. Repeat multiparametric MRI in prostate cancer patients on active surveillance. protocols.io dx.doi.org/10.17504/protocols.io.j5jcq4n

Record Creation Time: 20210329T220548+0000

Record Last Update: 20210329T221203+0000

Data and Source Information

Source: