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A magnetic sentinel node procedure for oral cancers patients

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Goal: To investigate the feasibility of a magnetic tracer and magnetic detector for the detection of sentinel nodes (SNs) in early oral cancer (cT1-T2N0M0) patients.

Background: In the current sentinel node procedure, radioisotopes and a gamma probe are used for SN detection (gold standard). However, within the head and neck area and especially floor of mouth, the procedure may be less reliable due to shine-through effect (De Bree & Nieweg, 2015). With the given shine-through effect alternatives for this gold standard are investigated. One of the alternatives is the use of a magnetic marker and a second-generation magnetic detector, which is investigated in the IronNanoLoc project. This magnetic detector is based on a new magnetic detection technique, differential magnetometry (DiffMag), that detects the non-linear signature of the magnetic particles (Waanders et al., 2016). Making the technique insensitive to the natural magnetic response of the body and better usable in combination with regular surgical instruments, which is different from the first-generation magnetic detector (SentiMag®).

Materials and methods: To test the feasibility of the magnetic route in SN detection in oral cancer patients, several studies will be performed. DiffMag handheld probe will be compared to SentiMag® and to the gold standard. Before we can use DiffMag in a clinical setting, some safety aspects need to be checked. Until then, studies with this probe will be performed in the laboratory. A feasibility study with the SentiMag® to detect SNs of oral cancer patients in a validation setting (all patients undergo a planned elective neck dissection regardless of results of SN procedure) is ongoing in Medisch Spectrum Twente, Enschede, the Netherlands.

Results: First steps are made to get DiffMag handheld probe clinically safe. Pilot study patient inclusion started in February 2018.

Conclusion: A start is made to test the feasibility of a magnetic SN procedure in oral cancer patients.

