

Postoperative breast MRI in patients undergoing sentinel node biopsy using super paramagnetic iron oxide nanoparticles

Submission date 30/12/2017	Recruitment status No longer recruiting	<input type="checkbox"/> Prospectively registered <input type="checkbox"/> Protocol
Registration date 16/01/2018	Overall study status Completed	<input type="checkbox"/> Statistical analysis plan <input type="checkbox"/> Results
Last Edited 16/01/2018	Condition category Cancer	<input type="checkbox"/> Individual participant data <input type="checkbox"/> Record updated in last year

Plain English summary of protocol

Background and study aims

Superparamagnetic iron oxide (SPIO) nanoparticles are a new tracer for the detection of breast cancer. Recent results have shown that injection of SPIO up to 4 weeks before surgery is feasible and increases detection rates. This is a very important advantage as it saves time during surgery. However, due to its paramagnetic properties, SPIO causes artefacts on MRI and if MRI has to be performed, it has to be done before the injection of SPIO. Skin staining is the most common side effect of SPIO injection. It has been shown to be related to the prolonged residence of the substance in the tissue, which is shown by the fact that stained tissue has a magnetic signal and that it is almost exclusively observed in breast conserving surgery. This is a matter of interest for patients who need to be followed up with MRI after surgery. The long lasting staining may pose a restriction as MRI will be contaminated by SPIO artefacts. Staining is significantly less if SPIO is injected deeply, near the tumour. The aim of this study is to confirm that, since the injected tissue and most of the SPIO are removed, there should not be any SPIO artefacts, or they should be much smaller.

Who can participate?

Women with breast cancer undergoing breast conserving surgery

What does the study involve?

After surgery, the background magnetic count is recorded. Skin staining and magnetic activity in the breast 2-3 weeks after the operation are recorded and the patients are followed up with an MRI scan 3 months after the operation. Depending on the present of artefacts, MRI follow up may be extended to 5 years after the operation.

What are the possible benefits and risks of participating?

Participants have a more frequent follow-up, but no other form of compensation or benefit. Taking part in the study has no risks for the patients, as breast MRI within the study is conducted without using intravenous paramagnetic contrast. The decision for contrast is made individually according to clinical indications.

Where is the study run from?

1. Uppsala University Hospital (Sweden)
2. Västmanland County Hospital (Sweden)

When is the study starting and how long is it expected to run for?

September 2017 to February 2023

Who is funding the study?

Uppsala University (Sweden)

Endomagnetics Ltd

Who is the main contact?

Dr Andreas Karakatsanis

Contact information

Type(s)

Scientific

Contact name

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751 85

Additional identifiers

Protocol serial number

N/A

Study information

Scientific Title

The compatibility of POSToperative breast MRI in patients who underwent MAGnetic guided sentinel lymph node biopsy (POSTMAG MRI): a prospective study

Acronym

POSTMAG MRI

Study objectives

Superparamagnetic iron oxide (SPIO) nanoparticles are a novel tracer for the detection of sentinel node (SN) in patients with breast cancer. Apart from comparable performance of SPIO as a sole tracer to the dual standard, recent results have demonstrated that the preoperative injection of SPIO up to 4 weeks preoperatively in an outpatient basis is feasible and leads to

enhancement of the detection rates, compared to the perioperative administration. This is a very important advantage, since it simplifies logistics and reduces operative time. However, due to its paramagnetic properties, SPIO causes artefacts on MRI and, if MRI has to be performed, it has to be done before the injection of SPIO.

Skin staining is the most common side effect of SPIO injection. It has been shown to be related to the prolonged residence of the substance in the tissue, a remark that is enhanced by the facts that stained tissue has a magnetic signal and that it is almost exclusively observed in breast conserving surgery (BCS). This is a matter of interest for patients who need to be followed postoperatively with MRI. Despite the fact that the indications are few, the long lasting staining may pose a restriction since MRI will be contaminated by SPIO artefacts. Peritumoral injection yields comparable SN detection rates and is connected with the presence of less staining, since the injected tissue is excised.

This prospective observational study will assess the compatibility of postoperative MRI in patients who have been injected peritumourally with SPIO for SN biopsy.

Hypothesis: Background counts on a magnetometer as well as skin discoloration correlate to the amount of SPIO residual in the tissue after breast conservation and therefore with the presence of artefacts on postoperative MRI in patients who underwent sentinel node biopsy for breast cancer with the use of SPIO.

Ethics approval required

Old ethics approval format

Ethics approval(s)

Ethics Committee Uppsala University, 20/07/2017, ref: DNR 2014/073 + 2014/073/1 + 2014/073/2

Study design

Multicentre observational longitudinal study.

Primary study design

Observational

Study type(s)

Diagnostic

Health condition(s) or problem(s) studied

Breast cancer

Interventions

Women undergoing BCS will take part in the study. After specimen excision, the background magnetic count will be registered. Postoperative skin staining and magnetic activity in the breast 2-3 weeks postoperatively will be registered and the patients will be followed with an MRI 3 months after the operation. Depending on the presence of artefacts, MRI follow-up may be extended to 5 years postoperatively.

Intervention Type

Other

Primary outcome(s)

Magnetic signal in the breast and discoloration are registered intraoperatively, 1 and 3 months after surgery. If SPIO artefacts are seen on postoperative baseline MRI conducted 3 months after the operation, the patient will be followed up 6 months postoperatively and thereafter annually with controls as stated above up to 5 years postoperatively

Key secondary outcome(s)

Impact of different SPIO volumes on the prevalence of skin staining and MRI artefacts

Completion date

01/02/2023

Eligibility**Key inclusion criteria**

Patients with DCIS or T1 to T3 invasive breast cancer planned for BCS and SNB study

Participant type(s)

Patient

Healthy volunteers allowed

No

Age group

Adult

Sex

Female

Key exclusion criteria

1. Intolerance/hypersensitivity to iron or dextran compounds or Sienna XP
2. Patients with an iron overload disease
3. Patients with pacemakers or other implantable devices in the chest-wall, or prosthesis in the shoulder
4. Patient deprived of liberty or under guardianship
5. Pregnant or lactating patients
6. Intraoperative or postoperative conversion to mastectomy
7. Inability to provide informed consent

Date of first enrolment

01/09/2017

Date of final enrolment

01/09/2019

Locations**Countries of recruitment**

Sweden

Study participating centre
Uppsala University Hospital
751 85

Study participating centre
Västmanland County Hospital
721 89

Sponsor information

Organisation
Uppsala University

ROR
<https://ror.org/048a87296>

Funder(s)

Funder type
University/education

Funder Name
Uppsala Universitet

Alternative Name(s)
Uppsala University, UU_University, Uppsala Universitet, Sweden, UU

Funding Body Type
Government organisation

Funding Body Subtype
Universities (academic only)

Location
Sweden

Funder Name
Endomagnetics Ltd

Results and Publications

Individual participant data (IPD) sharing plan

The data sharing plans for the current study are unknown and will be made available at a later date.

IPD sharing plan summary

Data sharing statement to be made available at a later date

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Participant information sheet	Participant information sheet	11/11/2025	11/11/2025	No	Yes