ISRCTN10557832 https://doi.org/10.1186/ISRCTN10557832

MR-guided adaptive stereotactic radiotherapy in localised pancreatic cancer

Submission date
12/08/2022

Recruitment status
No longer recruiting

Registration date
16/08/2022

Overall study status
Completed

Last Edited
27/01/2026

Condition category
Cancer

[X] Prospectively registered
[X] Protocol
[X] Statistical analysis plan
[X] Results
[_] Individual participant data

Plain English summary of protocol

https://www.cancerresearchuk.org/about-cancer/find-a-clinical-trial/a-study-of-giving-radiotherapy-in-a-fewer-number-of-treatments-for-pancreatic-cancer-emerald

Background and study aims
An MR Linac combines two technologies – a magnetic resonance imaging (MRI) scanner and a conventional radiotherapy treatment machine (also known as a linear accelerator - Linac). Having radiotherapy (RT) on an MR Linac allows high-quality MR images to be taken daily before treatment and while the treatment is delivered with an associated adaptation of the radiotherapy treatment, called MR-guided adaptive RT. The optimal RT dose and schedule to treat pancreatic cancer are not known and doses have been limited by the need to keep the dose to normal surrounding tissues within accepted limits. Audit data has shown that when treatment is delivered on an MR Linac the tumour is targeted more effectively and normal tissues can be avoided. There is therefore the potential to safely deliver higher doses whilst keeping the dose to normal tissues within accepted limits. This study will evaluate whether increased RT doses and treatment over fewer days can be safely delivered to patients with pancreatic cancer on an MR Linac and whether this will improve the benefit of MR Linac treatment further. This study will also look at whether there are any changes in the tumours and normal tissues over the course of RT that can be seen on the MR images taken by the MR Linac, with the aim to find indicators from the imaging which may in the future be used to plan treatment more individually. The researchers will also collect blood samples to evaluate any changes in the immune response.

Who can participate?
Patients aged 16 years or above scheduled to receive MRgRT for pancreatic cancer

What does the study involve?
There are three phases to recruitment for this study: an initial safety run-in, a focussed recruitment phase, and an expansion phase. A recruitment pause may be implemented in any phase for any regimen if deemed necessary at any time. Participants receive either 5, 3 or 1-fraction MR-guided stereotactic radiotherapy over 1-3 weeks. The assigned choice is dependent on the order the patient is referred.

What are the possible benefits and risks of participating?
The participants will be having state-of-the-art- treatment over a very short time period. It is unknown whether the higher dose of RT or giving RT over a shorter period causes more side effects.

Where is the study run from?
The Churchill Hospital and the Genesis Care Clinic (UK)

When is the study starting and how long is it expected to run for?
July 2022 to January 2025

Who is funding the study?
MRC Institute for Radiation Oncology, Department of Oncology, University of Oxford, John Black Charitable Foundation, University of Oxford/GenesisCare Collaboration fund

Who is the main contact?
Lynda Swan, octo-emerald@oncology.ox.ac.uk

Contact information

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Public

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Type(s)
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Additional identifiers

Integrated Research Application System (IRAS)
279946

Central Portfolio Management System (CPMS)
52969

Protocol serial number
OCTRU-330

Study information

Scientific Title
Evaluation of hypofractionated adaptive radiotherapy using the MR Linac in localised pancreatic cancer

Acronym
EMERALD - Pancreas

Study objectives
To establish the safety of MR-guided hypofractionation stereotactic body radiotherapy (SBRT) in localised pancreatic cancer

Ethics approval required
Old ethics approval format

Ethics approval(s)
Approved 07/07/2022, West Midlands - Black Country Research Ethics Committee (The Old Chapel, Royal Standard Place, Nottingham, NG1 6FS, UK; +44 (0)207 1048010, +44 (0)207 1048141; blackcountry.rec@hra.nhs.uk), ref: 22/WM/0122

Study design
Single-centre three-arm non-randomized interventional trial

Primary study design
Interventional

Study type(s)
Treatment

Health condition(s) or problem(s) studied
Locally advanced pancreatic cancer

Interventions
5, 3 or 1-fraction MR-guided stereotactic radiotherapy over 1-3 weeks. The assigned choice is dependent on the order the patient is referred.

Intervention Type
Other

Primary outcome(s)
Dose Limiting Toxicity (DLT) within 3 months from the start of magnetic resonance guided radiotherapy (MRgRT), defined as:
1. Grade 3 upper gastrointestinal bleeding
2. Gastro-intestinal fistula (any grade)
3. Grade 4 nausea/vomiting uncontrolled despite optimum anti-emetics
4. Grade 4 pancreatitis not stent-related
5. Vascular events (where these are not considered to be tumour related)

Key secondary outcome(s))
1. Efficacy of MRgRT up to 24 months follow-up, assessed using:
1.1. Overall survival and progression-free survival
1.2. Freedom from local progression
1.3. Freedom from metastatic progression
2. Definitive resection rate for those undergoing surgery evaluated at surgery: R0/R1/R2 resection margin rates; rate of pathological complete response
3. Long-term toxicity rates (only those specifically related to SBRT):
3.1. All Grade 3+ toxicities to 12 weeks from the start of MRgRT
3.2. Any late GI adverse events (AE) > grade 2 (CTC v5) after 12 weeks from the start of MRgRT
4. Freedom from further line chemotherapy: time from the start of MRgRT to re-start of further chemotherapy, anytime from the start of MRgRT up to 24 months

Completion date
31/01/2025

Eligibility

Key inclusion criteria
1. Participants must be fit and scheduled to receive MRgRT for pancreatic cancer. There are no specific restrictions on tumour size, number or interval from diagnosis
2. Localised pancreatic cancer, which may be
2.1. Locally advanced and inoperable pancreatic cancer
2.2. Inoperable on medical grounds
2.3. Operable, but patient declines surgery
2.4. Locally recurrent pancreatic cancer
3. Histologically proven pancreatic ductal adenocarcinoma or cytological proven pancreatic malignancy. Where histology/cytology is ‘suspicious’ MDT should confirm that it is appropriate to treat as malignancy
4. Male or Female, aged 16 years or above
5. Life expectancy of at least 6 months
6. ECOG performance status 0-1
7. Haematological and biochemical indices within defined ranges:
7.1. Haemoglobin (Hb) ≥8.0 g/dL
7.2. Platelet count ≥50 x 10e9/l
7.3. Neutrophils ≥1.0 x 10e9/l
7.4. Total bilirubin ≤1.5 x IULN
7.5. AST(SGOT) or ALT(SGPT) ≤ 3.0 x IULN

8. Able (in the investigators' opinion) and willing to comply with all study requirements for the duration of the study
9. Willing and able to give informed consent

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Mixed

Lower age limit
16 years

Upper age limit
100 years

Sex
All

Total final enrolment
25

Key exclusion criteria
1. Patients with specific MRI exclusion criteria – metallic implants, shrapnel, claustrophobia or other expected intolerance of prolonged (up to 90 minutes) stay in an MRI scanner
2. Prior radiotherapy to the upper abdomen
3. Pregnant or breastfeeding women, or women of childbearing potential unless effective methods of contraception are used. Male patients who do not agree to use a condom during RT treatment and for 3 months after or who are not surgically sterile.
4. Distant metastatic disease or local disease that cannot be encompassed in the SBRT field

Date of first enrolment
24/08/2022

Date of final enrolment
09/11/2023

Locations

Countries of recruitment
United Kingdom

England

Study participating centre

Churchill Hospital
Churchill Hospital
Old Road
Headington
Oxford
England
OX3 7LE

Sponsor information

Organisation
University of Oxford

ROR
https://ror.org/052gg0110

Funder(s)

Funder type
Hospital/treatment centre

Funder Name
GenesisCare

Funder Name
University of Oxford

Funder Name
MRC Institute for Radiation Oncology

Funder Name
John Black Charitable Foundation

Alternative Name(s)
The John Black Charitable Foundation, JBCF

Funding Body Type
Government organisation

Funding Body Subtype
Trusts, charities, foundations (both public and private)

Location
United Kingdom

Results and Publications

Individual participant data (IPD) sharing plan
The data collected for the study, including individual participant data and a data dictionary defining each field in the set, will be made available to researchers on request to the study team and with appropriate reason, via octo-enquiries@oncology.ox.ac.uk. The shared data will be de-identified participant data and will be available for 3 years following the publication of the study. Data will be shared with investigator support, after approval of a proposal and with a signed data access agreement.

IPD sharing plan summary
Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Protocol article		14/09/2023	15/09/2023	Yes	No
Basic results		27/01/2026	27/01/2026	No	No
HRA research summary			28/06/2023	No	No
Participant information sheet		11/11/2025	11/11/2025	No	Yes
Protocol file	version 3.0	25/09/2023	27/01/2026	No	No
Statistical Analysis Plan	version 1.0	09/04/2024	27/01/2026	No	No
Study website		11/11/2025	11/11/2025	No	Yes