Surefire Infusion system vs. standard Microcatheter use during holmium-166 radioembolization for the treatment of colorectal liver metastases.

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To investigate whether using the ARC during 166Ho-RE increases the post-treatment tumor to non-tumor (T/N) activity concentration ratio, compared to using a standard end-hole microcatheter.

Ethical review	Approved WMO
Status	Recruitment stopped
Health condition type	Hepatobiliary neoplasms malignant and unspecified
Study type	Interventional

Summary

ID

NL-OMON47111

Source
ToetsingOnline

Brief title
SIM trial

Condition

- Hepatobiliary neoplasms malignant and unspecified
- Hepatobiliary neoplasms malignant and unspecified

Synonym
Colorectal cancer liver metastases

Research involving
Human

Sponsors and support

Primary sponsor: Universitair Medisch Centrum Utrecht
Source(s) of monetary or material Support: Ministerie van OC&W

Intervention

Keyword: Colorectal liver metastases, Holmium, Radioembolization, Surefire

Outcome measures

Primary outcome

The primary endpoint is the T/N activity concentration ratio. The primary endpoint will be compared between the ARC and standard micocatheter infusions.

Secondary outcome

Secondary endpoints include mean absorbed doses of radioactivity in tumorous and healthy liver tissue, infusion efficiency, the predictive value of 166Ho-scout dose and tumor response. These enpoints will be compared between the ARC and standard micocatheter infusions. A dose-response relationship, clinical toxicity and overall survival will be assessed for the entire cohort.

Study description

Background summary

Radioembolization (RE) is a safe and effective locoregional therapy for unresectable chemorefractory colorectal cancer liver metastases (CRCLM). Holmium-166 micorspheres (166Ho) have proven to be a safe and effective substitute for routinely used yttrium-90 microspheres (90Y), while their superior imaging capacities allow for visualization of the intrahepatic microsphere biodistribution and quantitative assessment of radioactive doses absorbed by tumorous and healthy liver tissue on single-photon emission computed tomography (SPECT-CT) and magnectic resonance imaging (MRI). Furthermore, a scout dose of identical microspheres can be administered on the same day to predict the intrahepatic distribution of the therapeutic 166Ho-microspheres. This is an important advantage over routine RE practice

with 90Y-microspheres, which rely on an inaccurate simulation with different particles (technetium-99m-labelled macro-albumin aggregates (99mTc-MAA)) in the week(s) before treatment. Recently, an infusion system has been developed that may further complement the treatment-efficacy of 166Ho-RE. It has been demonstrated that an anti-reflux infusion system significantly increases the infusion efficiency of intra-arterial embolotherapy by near-complete elimination of reflux, and induces a down-stream pressure gradient that may enhance tumor penetration. These effects may increase tumor absorbed doses after 166Ho-RE, which should translate in improved patient outcome. Furthermore, the unique centroluminal catheter position during infusion may further increase the accuracy of the 166Ho-scout dose as a predictor for the intrahepatic distribution of therapeutic 166Ho-microspheres by limiting laminar flow patterns, which are important contributors to a disproportionate microsphere distribution after infusion through a standard end-hole microcatheter.

Study objective

To investigate whether using the ARC during 166Ho-RE increases the post-treatment tumor to non-tumor (T/N) activity concentration ratio, compared to using a standard end-hole microcatheter.

Study design

Clinical phase 2, within-subject randomized controlled trial.

Intervention

Scout and therapeutic doses of 166Ho-microspheres will be administered in the hepatic artery during two sequential procedures on the same day. In all subjects, the use of the ARC and the standard end-hole catheter will be randomly allocated to the infusion site (left and right hepatic artery).

Study burden and risks

166Ho-RE will largely be performed as in previous phase I-II clinical trials, and the patient burden is comparable to routine yttrium-90 radioembolization. The anti-reflux infusion system used in this study is a CE-marking and FDA-approved medical device (for the intended purpose) that has already been used extensively in clinical care. Furthermore, it has been shown that the use of the ARC eliminates the need for coil embolization, and reduced treatment complexity, procedure time, contrast- and radiation burden.

Contacts

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Trial sites

Listed location countries

Netherlands

Eligibility criteria

Age
Adults (18-64 years)
Elderly (65 years and older)

Inclusion criteria

* Written informed consent.
* Histopathologically confirmed diagnosis of adenocarcinoma of the colon or rectum.
* Hepatic metastases with measurable morphological appearance (* 1 cm) on cross sectional imaging, located in the right and left hepatic arterial perfusion territory.
* Unresectable, liver dominant disease.
* Progressive disease after second line chemotherapy or no further chemotherapeutical treatment options due to severe side effects or unwillingness of the patient to undergo systemic chemotherapy.
* Age * 18 years.
* Expected adequacy of follow-up.

Exclusion criteria

* WHO (World health organization) performance score > 2
* Inadequate bone marrow function (hemoglobin < 6.0 mmol/l, leukocyte count < 3.0 x 10^9/l, platelet count < 75x 10^9/l), inadequate liver function (bilirubin > 35 µmol/l, aspartate aminotransferase / alanine aminotransferase (AST/ALT) > 5 x upper limit of normal (ULN)) or inadequate renal function (creatinine > 1.5 x ULN).
* Prior hemihepatectomy.
* Compromised biliary system (biliary stent or hepaticojejunostomy).
* Child Pugh score B7 or worse.
* Active hepatitis B or C.
* Main portal vein thrombosis on CT (or previous portal vein embolization).
* Severe celiac axis stenosis on CT.
* Unsuitable hepatic arterial anatomy on CT.
* Treatment with systemic chemotherapy within 4 weeks prior to radioembolization.
* Previous participation in a study classified as class III by a radiation safety committee
* Bleeding diathesis.
* Pregnancy or breast feeding.
* Life expectancy < 3 months.
* Patients who are declared incompetent.
* Any condition that prevents from safe treatment with radioembolization.

Study design

Design

Study phase:	2
Study type:	Interventional
Masking:	Open (masking not used)
Control:	Uncontrolled
Primary purpose:	Treatment

Recruitment

NL

Recruitment status:	Recruitment stopped
Start date (anticipated):	26-11-2014
Enrollment:	25
Type:	Actual

Medical products/devices used

Generic name:	Surefire Precision Infusion Catheter System
Registration:	Yes - CE intended use

Ethics review

Approved WMO Date:	17-07-2014
Application type:	First submission
Review commission:	METC Universitair Medisch Centrum Utrecht (Utrecht)
Approved WMO Date:	06-10-2014
Application type:	Amendment
Review commission:	METC Universitair Medisch Centrum Utrecht (Utrecht)
Approved WMO Date:	29-12-2014
Application type:	Amendment
Review commission:	METC Universitair Medisch Centrum Utrecht (Utrecht)
Approved WMO Date:	14-01-2015
Application type:	Amendment
Review commission:	METC Universitair Medisch Centrum Utrecht (Utrecht)
Approved WMO Date:	09-09-2015
Application type:	Amendment
Review commission:	METC Universitair Medisch Centrum Utrecht (Utrecht)
Approved WMO Date:	15-03-2017
Application type:	Amendment
Review commission:	METC Universitair Medisch Centrum Utrecht (Utrecht)
Approved WMO Date:	13-07-2017
Application type:	Amendment
Review commission:	METC Universitair Medisch Centrum Utrecht (Utrecht)
Approved WMO	

Date:	31-08-2017
Application type:	Amendment
Review commission:	METC Universitair Medisch Centrum Utrecht (Utrecht)
Approved WMO Date:	27-02-2018
Application type:	Amendment
Review commission:	METC Universitair Medisch Centrum Utrecht (Utrecht)

Study registrations

Followed up by the following (possibly more current) registration

No registrations found.

Other (possibly less up-to-date) registrations in this register

No registrations found.

In other registers

Register	ID
ClinicalTrials.gov	NCT02208804
CCMO	NL48905.041.14