Hemodynamic consequences of intra arterial treatment of intracranial aneurysms using non-invasive quantitative flow measurements from arterial spin labeling techniques in high field strength MRI.

Published: 18-01-2012 Last updated: 01-05-2024

Primary objective:- Determining the extent to which perfusion territories of the larger intracranial arteries are affected by endovascular treatment of intracranial aneurysmsSecondary objectives:- Defining the relationship between collateral...

Ethical review	Approved WMO
Status	Recruitment stopped
Health condition type	Aneurysms and artery dissections
Study type	Observational non invasive

Summary

ID

NL-OMON37854

Source ToetsingOnline

Brief title Hemodynamic consequences of treatment of intracranial aneurysms

Condition

• Aneurysms and artery dissections

Synonym

Aneurysm, vascular distension

Research involving

1 - Hemodynamic consequences of intra arterial treatment of intracranial aneurysms u ... 10-05-2025

Human

Sponsors and support

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

Intervention

Keyword: Aneurysm, Arterial Spin Labeling, Cerebral, MRI

Outcome measures

Primary outcome

The primary parameters of the study are the regional cerebral blood flow (rCBF)

and maps of perfusion territories of individual arteries. rCBF measurements

will be determined on the basis of drawn region-of-interests (ROI) before and

after intervention. In this research the extent of the effect of endovascular

treatment on above parameters will be globally identified.

Secondary outcome

Arterial transit time (ATT) is a secondary parameter. These measurements allow

comparison of cerebral border zones.

Study description

Background summary

Arterial Spin Labeling (ASL) is a recently developed method that allows selective, quantitative and non-invasive measurements of specific perfusion territories of the larger cerebral arteries. These techniques may be of great importance in the choice of therapy in patients with cerebrovascular disease. Yet ASL techniques are not fully implemented within the UMCG.

Extensive research on this subject has been done by former doctoral student Van Laar and radiologist Hendrikse et al of the UMCU. A large variability of ipsilateral perfusion territories has been demonstrated in a group of patients with symptomatic occlusion of the ICA. Within these patients the perfusion territory of the MCA on the occluded side was largely supplied by collaterals originating from the VBA while the contralateral ICA contributed significantly to the perfusion territory of both ACA*s. A large part of this redistribution of blood flow was related to the Circle of Willis. The configuration of the Circle of Willis appears to strongly affect the extent of cerebral perfusion territories.

To further implement the ASL techniques in this study the perfusion territories of the larger cerebral arteries are compared before and after endovascular treatment of intracranial aneurysms. As to our best knowledge few studies have been conducted on the non-invasive follow-up of coiled intracranial aneurysms. Most studies aim to identify the diagnostic potential of 3D TOF sequences. The study to be conducted allows non-invasive judgement of collateral circulation and identification of areas at increased risk of ischemia. The goal of the study is to determine to what extent perfusion territories and cerebral border zones are affected by endovascular treatment of intracranial aneurysms. Information on the relationship between chosen endovascular treatment and hemodynamic consequences could be of influence in the future approach of patients.

Study objective

Primary objective:

- Determining the extent to which perfusion territories of the larger intracranial arteries are affected by endovascular treatment of intracranial aneurysms

Secondary objectives:

- Defining the relationship between collateral circulation and the anatomy and blood flow direction of the circle of Willis.

- Examine alterations in post-treatment cerebral border zones.

Study design

This research will be conducted as a pilot study in a 7 month period that will take place in the Neuroimaging Center in Groningen. Adult patients with a unruptured aneurysms who have been selected for elective endovascular treatment will be asked to participate in the study by means of informed consent. Before treatment an ASL perfusion scan will be performed. In the follow-up additional sequences will be added to the existing scanning protocol: pCASL and PC MRA of the circle of Willis.

Study burden and risks

All participants will receive an additional MRI scan prior to treatment.

3 - Hemodynamic consequences of intra arterial treatment of intracranial aneurysms u ... 10-05-2025

Patients will be asked to hold still during the procedure. In the follow-up additional sequences will be added to the existing scanning protocol. These sequences have been tested on healthy volunteers. The safety of the used materials (coils and stents) in a 3 T MRI system is verified using information on the website MRIsafety.com.

Contacts

Public Universitair Medisch Centrum Groningen

Hanzeplein 1 9700 RB NL **Scientific** Universitair Medisch Centrum Groningen

Hanzeplein 1 9700 RB NL

Trial sites

Listed location countries

Netherlands

Eligibility criteria

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

Inclusion criteria

Adult patients with unruptured intracranial aneurysm, selected for elective endovascular treatment.

Exclusion criteria

MRI- contraindications Other known cerebrovasculair disease

Study design

Design

Study type: Observational non invasive		
Masking:	Open (masking not used)	
Control:	Uncontrolled	
Primary purpose:	Diagnostic	

Recruitment

NL	
Recruitment status:	Recruitment stopped
Start date (anticipated):	18-01-2012
Enrollment:	20
Туре:	Actual

Ethics review

Approved WMO	
Date:	18-01-2012
Application type:	First submission
Review commission:	METC Universitair Medisch Centrum Groningen (Groningen)

Study registrations

Followed up by the following (possibly more current) registration

No registrations found.

5 - Hemodynamic consequences of intra arterial treatment of intracranial aneurysms u ... 10-05-2025

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

No registrations found.

In other registers

Register

ССМО

ID NL38957.042.11