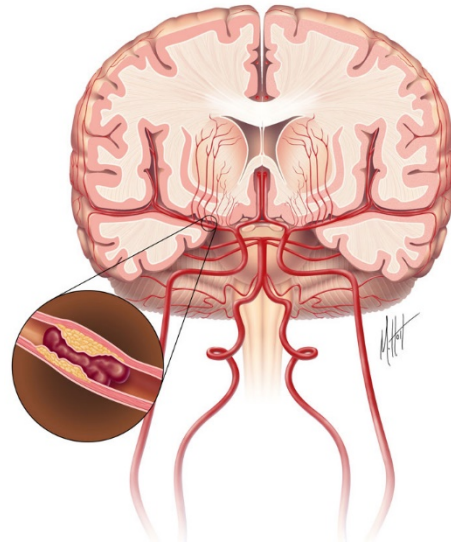


## Quantifying thrombus characteristics in spontaneously recanalized patients

### Introduction

An ischemic stroke is caused by the occlusion of an intracranial artery by a thrombus, which restricts blood supply to the brain. Currently, there are two treatments that aim at re-establishing intracranial perfusion: intra-venous thrombolysis (rt-PA), which aims to dissolve the thrombus, and mechanical thrombectomy, which aims to retrieve the thrombus from the vasculature.

When a patient is presented with stroke symptoms, she/he is brought to the nearest medical center. As part of the standard of care, a non-contrast CT (NCCT) scan and CT angiography (CTA) scan are performed. Among confirmation of ischemic stroke by an intracranial large vessel occlusion, and if there are no contraindications, the patient is treated with rt-PA, and then, she/he is treated with mechanical thrombectomy. Not all hospitals are able to perform the latter intervention. In these cases, the patient is first treated with rt-PA in the nearest non-intervention center and then, she/he is transferred to the intervention center. There, a second round of NCCT and CTA scans are performed. If the occlusion is still present, the patient is intervened.



Some of these transferred patients have shown that by the time they arrived to the intervention center the thrombus was already dissolved, so no thrombectomy needed to be performed. These are the patients we categorized as spontaneously recanalized patients. We think that the reaction to treatment of these patients compared to the patients where thrombectomy needed to be performed illustrates the heterogeneity of thrombi. The occluding thrombus is formed by a fibrin fibre network trapping red blood cells (RBC), platelets and other molecules. Thrombi vary in composition, age, and morphology which results in a wide spectrum of thrombus characteristics that we think affect treatment outcome.

The goal of this study is to quantify the characteristics of these spontaneously dissolved thrombi to study which of these characteristics differ from the thrombus characteristics of non-spontaneously recanalized patients.

### Goal

The goal of this project is to quantify the thrombus characteristics of spontaneously recanalized patients on non-contrast CT and CT angiography. You will learn about imaging techniques related with ischemic stroke and perform measurements of thrombus characteristics like thrombus length, perviousness, and absolute and relative attenuations on image data.

## Tasks

- Research literature of imaging in ischemic stroke and quantification of thrombus characteristics
- Perform measurements of thrombus characteristics on non-contrast CT and CT angiography data (thrombus length, perviousness, absolute and relative attenuations)
- Write a scientific report

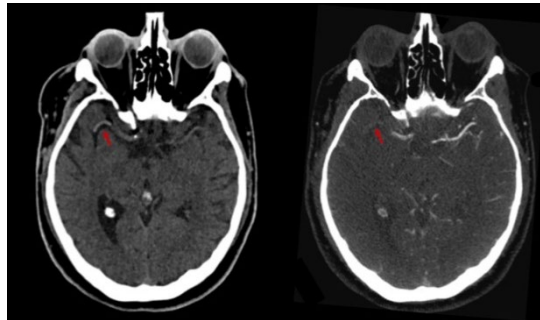


Figure: NCCT and CTA scans of the brain of an acute ischemic stroke patient. Red arrows display the site of the occlusion.

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