

Assessing the risk of stroke: thrombus formation in the left atrial appendage

Introduction

An ischemic stroke is caused by the occlusion of a vessel by a thrombus, which restricts blood supply to the brain (Figure 1A). The deprivation of blood to the brain rapidly causes brain tissue ischemia, which, if not treated, can end up as an infarction with often fatal consequences or long-term disabilities for the patient.

The occluding thrombus is often originated in the heart. Malfunctioning of the heart can lead to the formation of cardiac emboli, which can be dislodged, travel as an embolus, and end up occluding an intracranial artery. These cardiac thrombi are commonly formed in the left atrial appendage (LAA), an extension of the left atrium (Figure 1B). The size and shape of the LAA are highly variable, and play a major role in the formation of these thrombi.

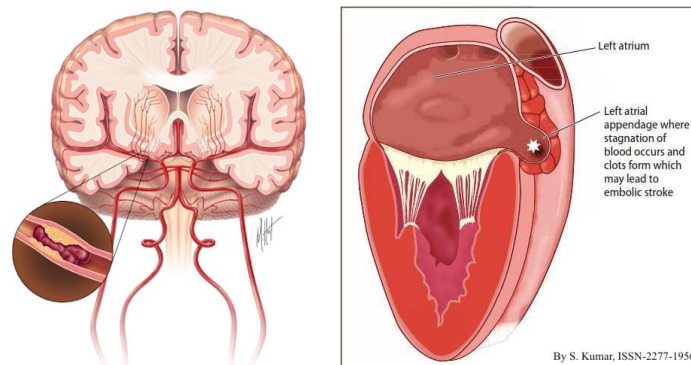


Figure 1. Left) Thrombus occluding a major intracranial artery. Right) Illustration of the heart: left atrium and left atrial appendage.

Goal

The goal of this project is to study the role of LAA morphology in the risk of thrombus formation and stroke occurrence. You will learn about radiological imaging techniques related with ischemic stroke and perform segmentations of the LAA. You will compare LAA morphology of stroke patients with and without LAA thrombi.

Tasks

- Research literature of thrombus formation and acute ischemic stroke
- LAA segmentations in radiological imaging data of stroke patients
- Work together with cardiologists, neurologists, radiologists and engineers
- Write a scientific report

Duration and eligible curricula

This project is available for a Bachelor or Master's student in medicine, technical medicine, biomedical sciences, or alike. Minimum project duration is 2 months; upon acceptance we will propose a detailed plan based on your background, available time and interests.

Contact

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