MEDVIZ FROM VISION TO DECISION

SEMINAR FRIDAY 27.09.2013

PLACE: 'Laboratoriebygget., Meetingroom 8.1 and 8.2, 8th floor

TIME : 12:00-13:00

SPEAKER/TITLE:

1. Postdoc Mai Tone Lønnebakken
Multimodality Imaging in Non-obstructive Coronary Artery Disease

2. Professor Knut Matre
Cardiac Imaging, temporal and spatial resolution

ABSTRACT

1. Mai Tone Lønnebakken

Coronary artery disease (CAD) caused by atherosclerosis may be both obstructive and non-obstructive. We recently demonstrated that non-obstructive CAD may reduce blood supply to the myocardium and give rise to myocardial ischemia in patients with acute non-ST elevation myocardial infarction. Non-obstructive CAD is particularly common in women and is difficult to diagnose with conventional coronary angiography and echocardiography. Computer tomography (CT) coronary angiography is a new non-invasive cardiac imaging technique suitable for detection of non-obstructive CAD. However, the association between non-obstructive CAD diagnosed by CT coronary angiography and myocardial ischemia has been less explored. We have previously validated that contrast echocardiography can detect myocardial ischemia in patients with angina pectoris and in acute non-ST elevation myocardial infarction (NSTEMI). The aim of the present project is to evaluate if detailed analysis of non-obstructive CAD on CT-coronary angiography can predict presence and severity of myocardial ischemia imaged by contrast echocardiography. The Micro-CAD project will recruit patients with angina pectoris and non-obstructive CAD by CT-coronary angiography for further imaging with contrast stress echocardiography for diagnosis of myocardial ischemia. Better characterization of patients with non-obstructive CAD will be done by supplemental assessment of vascular function by tonometry, biochemical and genetic markers as well as quality of life questionnaire. This interdisciplinary project is expected to add new knowledge to the impact of multimodality cardiac imaging in improving diagnosis, treatment and quality of life in patients with symptomatic non-obstructive CAD.

2. Knut Matre

Is cardiac imaging different from imaging of other organs? It is indeed different from imaging relatively stationary organs like the brain and abdominal organs. To catch the fast movement of the cardiac walls and blood (typically 2-6 cm/s for myocardium and 1 m/s for blood) a high temporal resolution is essential. Most other organs move due to respiration which will introduce much slower movement velocities. Because of this, cardiac imaging is focused on the temporal resolution and not always so much on the spatial resolution, the balance between temporal and spatial resolution is different.

So what is temporal resolution? Often this is equal to the frame rate, at least if no temporal filter or smoothing is applied during offline image processing. The optimal frame rate (for 2D) depends on the parameter you want to measure. Tissue or blood velocity, deformation parameters like strain rate, strain and twist all have different requirement for frame rate. 3D methods will often require multi-beat recordings and involve stitching of images to obtain sufficient volume rate to obtain reliable 3D visualization and deformation measurements.

Different modalities and cardiac applications will be discussed with emphasis on resolution for functional Measurements

Link to a presentation of the Reasearch Group: Bergen Hypertension and Cardiac Dynamics Group

MedViz seminar series http://medviz.uib.no