Multislice Coronary Arteriogram

Heart artery disease (coronary atherosclerosis) is a common cause of death in South Africa. Disease of the coronary arteries presents itself in two main ways. In the first mechanism, there is progressive narrowing of a segment of the coronary artery with reduced blood flow to the heart muscle causing patients to suffer from progressive exertional angina or chest pain. In the second mechanism, there is acute rupture of a soft plaque causing acute blockage of a coronary artery. This results in sudden loss of blood supply to the heart muscle resulting in a heart attack. This often occurs without prior symptoms.

Coronary Angiogram

Until recently the coronary angiogram was the only way to assess the degree of narrowing of the coronary artery by injection of an x-ray dye into the vessels and capturing x-ray images of the coronary arteries. This procedure is relatively safe but requires insertion of a long narrow tube directly into the coronary arteries. It carries a small life-threatening risk (0.08%) This examination is expensive and requires hospitalisation (at least a day's stay).

Multislice CT Coronary Angiogram

Recent advances in Computed Tomography (CT) have opened up a new non-invasive method of directly examining the coronary arteries. With the latest 64-multislice CT scanners, CT coronary angiography has been refined giving a high spatial resolution. This allows trained radiologists to produce more accurate and high-quality images of the coronary arteries. 3D and angiogram-like representations can be created from the data obtained using sophisticated computing power.

What is CT Coronary Angiography?

It is a relatively painless non-invasive examination of the coronary arteries. An x-ray dye is injected through a small plastic needle into a vein in the arm and the CT scan is performed.

The entire procedure time is about 15-20 mins with calcium scoring of the arteries being performed. Sometimes oral medication is required (beta-blocker tablet) if the patient has a high heart rate. The procedure is performed on an outpatient basis and the person is able to resume normal activities after the examination.

The CT scan captures images of the lumen of the coronary arteries as well as the presence of calcified and soft plaques in the wall of the arteries. This in turn allows the doctors to assess the degree of risk the patient has for coronary artery disease.

Soft plaques are unstable and can rupture causing sudden blockage of a coronary artery. This can result in a heart attack. CAT coronary angiogram is currently the only safe and non-invasive examination to show such soft plaques.

What are the benefits and the risks?

Benefits

- Cardiac CT for calcium scoring is a convenient and non-invasive way of evaluating the presence of coronary artery disease that is present despite the lack of symptoms.
- Cardiac CT takes little time and causes no pain.
- The examination can show the presence of coronary artery disease when the vessels are less than 50% narrowed. Standard cardiac tests will not reliably show this degree of blockage, and more than half of all heart attacks occur with less than 50% narrowing.
- It has a negative predictive value of 98%.
- CT coronary angiography is also useful to assess whether bypass grafts or stents are still open or blocked

Risks

- Pregnant women should avoid having cardiac CT. If there is any possibility that you are pregnant you should inform the radiographer.
- The examination exposes the patient to a limited amount of radiation.
- Cardiac CT may show an abnormality that sometimes requires further tests.
- There is a small risk of allergic reaction to the iodine contrast medium that is administered.
- Normal kidney function is required before iodine contrast can be injected.

Who should benefit from having CT coronary angiography?

- Patients with atypical or non-anginal chest pain
- Patients with equivocal stress tests
- Asymptomatic patients with one or more of the following risk factors: smoking, high cholesterol, family history of heart disease, high blood pressure, overweight, diabetes, sedentary lifestyle.