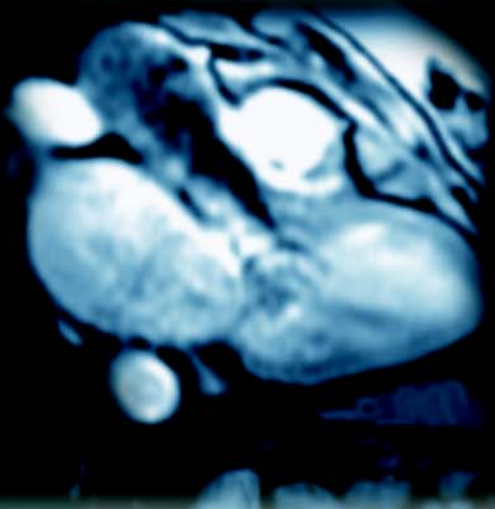




Hong Kong Sanatorium & Hospital

Cardiac MRI



**Department
of
Diagnostic Radiology**

What is Heart Disease?

Heart disease is a general term describing a spectrum of diseases including coronary artery disease, congenital heart disease, valvular heart disease and cardiomyopathy. Amongst those mentioned, coronary artery disease is the commonest. It is the number 2 killer in Hong Kong. Every year about 5000 people die from heart disease. Early diagnosis and appropriate treatment greatly improve the mortality and morbidity. There is a need for non-invasive and accurate studies, which could detect and evaluate patients with heart disease.

The needs for early diagnosis of heart disease prompted the installation of a new cardiac magnetic resonance scanner (General Electric Signa CV/i Scanner) in November 2000 at the Hong Kong Sanatorium and Hospital. This is the first of such MR scanner Hong Kong. The enhanced gradient system enables us to do ultrafast scans of various parts of body including the heart. Crispy image of the beating heart is now obtainable in a few seconds so that a comprehensive examination of the heart is finished within 30 minutes.

MRI has definite advantage over other imaging modalities in the study of heart disease. The excellent contrast resolution enables the differentiation of the various layers of heart including endocardium, myocardium and the epicardium. MRI is non-invasive; there is no radiation involved in the production of medical images. This is quite different from other imaging modalities, which are more invasive and requires the use of radiation. The unique multi-planar capability of MRI surpasses other methods in studying the complex anatomy of cardiac structures.

Quantitative measurement of cardiac function by measuring the stroke volume, ejection fraction and myocardial mass is now possible with this new scanner. They are important indices of cardiac functions.

MR diagnosis of coronary artery disease

MR diagnoses coronary artery disease not by seeing the actual narrowing of the coronary artery. It depends on the demonstration of myocardial perfusion defects noted during stress test due to lack of blood supply. The diseased artery can be deduced by noting the site and extent of perfusion defect.

The examination is very simple. A normal test should finish in 30 minutes. Myocardial stress is induced by injecting a special stress agent for a few minutes. MR contrast agent is injected at the peak of stress. These stress agents are very safe, the effect will wane in 10 seconds after injection is stopped. This method has been used and been validated in many centers abroad. For example the Humbolt University of Berlin, Germany has done over 750 stress tests using the same MR scanner. None of them has any untoward effect.

Further Evaluation

MR is able to determine whether there is reversible damage to heart muscle. This is important as many patients could be saved by interventional procedures like angioplasty if the damage is reversible. If irreversible damage has already happened, there will be little benefit from doing interventional procedures.

In summary, MR is the most comprehensive examination of heart. The structure, function, coronary artery problems and heart muscle damage can be studied within 30 minutes without the need for invasive procedure or radiation. In the past, combination of different examinations is required to produce the same information provided by a single MR examination. Cardiac MR examination would be the most cost effective and informative study in evaluation for patients with heart problems.

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