什么是同位素扫描

同位素扫描是放射诊断专科的分支，兼用作治疗的效用，藉著透过人體内器官的新陈代谢作用，使能有效显示器官病态，早期发现肿瘤及正常生理病变。

同位素扫描一般包括静脉注射药物后数小时或数天后摄片，是诊断器官之重要方法之一。例如，心肌的放射性核素扫描可用以显示心肌的缺血性病变。

心臓血流供應檢查

心臓血流供應檢查是因血流低下而发生之心肌缺血，引起心绞痛者，可使用放射性核素扫描检查，以了解心肌的血流量和分布。

同位素扫描在心肌梗塞的诊断和治疗中具有重要的意义。例如，放射性核素扫描可以显示心肌的缺血性病变，而血液供应检查则可以检查心肌的血液供应。

胃摄影

胃摄影是搜尋胃或十二指肠的结构病变，例如胃癌、胃炎、胃溃疡、胃息肉等。

同位素扫描的其他应用

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What is Nuclear Medicine?

Nuclear Medicine is a branch of radiodiagnosis with emphasis on some aspects of radiation therapy. The major difference between nuclear medicine and conventional radiology is that nuclear medicine detects functional or physiological organ impairment, in complement to the detection of structural abnormalities by plain-film radiography, sonography, computed tomography (CT), and magnetic resonance (MR) imaging.

In a typical nuclear medicine imaging examination, a specific medication is injected intravenously. This medication is called a radiopharmaceutical because it is composed of a radioactive isotope and a pharmaceutical which has a specific property that selectively goes to the target organ of interest. The radiopharmaceutical emits an electromagnetic wave (what it gamma ray) that can be monitored using a suitable detector (therefore we call this detector a gamma camera).

Myocardial Perfusion (Blood flow of the heart) Scintigraphy

The heart receives life-giving blood from vessels called coronary arteries. If these arteries become partially blocked or narrowed by the accumulation of plaque, the heart may not receive the amount of blood necessary for proper function. This narrowing of the coronary arteries is often caused by atheroatherosclerosis, one of the causes of a disease entity we called coronary artery disease (CAD).

As CAD progresses, the heart muscle may not receive sufficient blood particularly under stress. This results in chest pain called angina. On the other hand, these may not be any outward physical signs of the disease. Myocardial Perfusion Scintigraphy is a well-known non-invasive means to detect the presence of CAD as well as to assess the severity of CAD in relation to function.

Bone Scintigraphy

The human skeleton needs phosphate as a substrate in metabolism. An area in the skeleton that works harder (with a higher metabolic activity) requires more phosphate. For example, when a tumor spreads to bone, the tumor cells disrupt the normal bone matrix organization (“eat” away normal bone). The human skeleton then reacts by trying to repair the damage. This repair needs more phosphate than normal bone metabolism.

Different tumor cells can cause different rates of bone invasion and skeletal repair is likewise different. Even small repair can be detected and this is why scintigraphy can be very sensitive as the detection of early tumor invasion to bone before an apparent structural damage is seen on plain film radiographs.

Thyroid Scintigraphy and treatment for thyrotoxicosis

The human thyroid gland needs iodine to make the thyroid hormones, which basically regulates the metabolic activities of the entire human body. When the gland is overactive, the patient may have heat intolerance, increased irritability, sweating, bowel movements, weight loss and increased amount of heart beats.

We can use iodine-131 for both diagnostic and therapeutic purposes. When there are lumps in the gland, it is sometimes useful to check, if these lumps are overactive or underactive. This examination is also useful to differentiate between a diffusely overactive gland and a gland with diffuse inflammation.

Renal (Kidney) Scintigraphy

This examination uses radiopharmaceuticals that are filtered or excreted by the kidneys. In this way, we can assess the filtering function, drainage function, as well as blood flow and gross morphology of the kidneys. This test is also very useful in the evaluation whether the kidney arteries are the cause of high blood pressure in some patients.

Radionuclide Therapy

Strontium - 89 Therapy for Bone Metastases

The therapy specifically targets sites of metastatic disease in bone, known and unknown, simultaneously. Strontium - 89 relieves pain associated with bone metastases and acts as an effective adjuvant therapy to arrest metastatic bone disease progression. In documented reports, more than 80% of patients experienced pain relief, and a majority had marked decrease in bone pain or completely pain-free.

Thyroid Cancer Treatment

Thyroid cancer may be multifocal, microscopically or macroscopically, in about 1/3 of the cases. After thyroidectomy, residual thyroid tissue or probable metastases should be treated with radioactive I-131 1311 amination. This may substantially lower the tumor recurrence rate as well as later metastases. H.K. Sanatorium & Hospital, is the only private hospital in Hong Kong incorporating a unique facility for thyroid cancer treatments.

Division of Nuclear Medicine

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