

Chapter 1 : CT coronary angiogram - Mayo Clinic

Clinical Cardiac CT: Anatomy and Function and millions of other books are available for Amazon Kindle. Learn more Enter your mobile number or email address below and we'll send you a link to download the free Kindle App.

Cardiac CT Overview Cardiac CT angiography enables noninvasive evaluation of the cardiac anatomy, including coronary arteries, great arteries and veins, and cardiac chambers. Coronary arteries can be evaluated for the presence of anatomic anomalies, plaques, stenoses, and occlusions. Information on bypass graft patency and other post-surgical status can also be obtained. The great vessels can be examined for the presence of abnormalities such as aneurysm, dissection, thrombus, and congenital anomalies. Cardiac CT angiography can also provide assessment of abnormalities of the cardiac chambers including the presence and extent of cardiac masses, ventricular aneurysm, and abnormal anatomic connections e. In addition, since multi-planar imaging reconstruction can be performed with cardiac CT angiography, high resolution three-dimensional images of the heart and blood vessels can be flexibly created, allowing for a better understanding and display of complex anatomic abnormalities than with many other imaging techniques. In the past, this information could only be reliably obtained with a cardiac catheterization. The high negative predictive value of cardiac CT angiography helps to prevent patients without significant cardiac disease from undergoing unnecessary cardiac catheterization. These images are analyzed to provide a quantitative evaluation of coronary artery calcification i. The CT Calcium Score is currently recommended as a stand-alone test for asymptomatic patients to help determine their future risk of adverse cardiovascular events. Our standard cardiac CT examination has two parts. Before proceeding to the second part of the exam, these images are quickly analyzed. If a patient has a large volume of coronary artery calcification, further assessment with CT angiography may be precluded; there is limited evaluation of the coronary artery lumen in the presence of calcified plaque. If appropriate, the second part of the CT examination, the cardiac CT angiogram, is then performed. Because of the intravenous contrast administration, patients will need to abstain from eating for 3 hours prior to the study. A dose of sublingual nitroglycerine will also usually be given to the patient immediately prior to image acquisition for the cardiac CT angiogram to help dilate the coronary arteries. Both parts of the study require the patient to hold their breath for approximately seconds the time it takes to scan the heart. The entire CT examination takes approximately minutes. Patients may return to normal activity immediately following the examination. **Contraindications** Contraindications to cardiac CT angiography include cardiac arrhythmias and renal failure. Prior contrast reactions are a relative contraindication; such patients can frequently be pre-treated with the use of a steroid and anti-histamine preparation one day prior to the examination. Symptomatic patients who have chest pain, an unclear clinical presentation or indeterminate prior non-invasive cardiac tests Patients with cardiac vascular anomalies Patients with bypass grafts Patients with congenital heart disease e. To schedule an appointment, please call radiology scheduling at

Chapter 2 : Cardiac CT Angiography | Clinical Gate

The expert authors then discuss the clinical application of cardiac CT for risk stratification, how to evaluate coronary artery disease, and the preoperative planning for and postoperative assessment of percutaneous cardiac procedures, including coronary stents and bypass grafts.

Overview Computers can combine these pictures to create a three-dimensional 3D model of the whole heart. This imaging test can help doctors detect or evaluate coronary heart disease, calcium buildup in the coronary arteries, problems with the aorta, problems with heart function and valves, and pericardial disease. Different CT scanners are used for different purposes. A multidetector CT is a very fast type of CT scanner that can produce high-quality pictures of the beating heart and can detect calcium or blockages in the coronary arteries. An electron beam CT scanner also can show calcium in coronary arteries. Your cardiac CT scan may be performed in a medical imaging facility or hospital. The scan usually takes about 15 minutes to complete, but can take more than an hour including preparation time and, if needed, the time to take medicines such as beta blockers to slow your heart rate. Before the test, a contrast dye, often iodine, may be injected into a vein in your arm. This contrast dye highlights your blood vessels and creates clearer pictures. You may feel some discomfort from the needle or, after the contrast dye is injected, you may feel warm briefly or have a temporary metallic taste in your mouth. The CT scanner is a large, tunnel-like machine that has a table. You will lie still on the table, and the table will slide into the scanner. Talk to your doctor if you are uncomfortable in tight or closed spaces to see if you need medicine to relax you during the test. During the scan, the technician will monitor your heart rate with an electrocardiogram EKG. You will hear soft buzzing, clicking, or whirring sounds when you are inside the scanner and the scanner is taking pictures. You will be able to hear from and talk to the technician performing the test while you are inside the scanner. Cardiac CT scans have some risks. In rare instances, some people may have an allergic reaction to the contrast dye. There is a slight risk of cancer, particularly in people younger than 40 years old, because the test uses radiation. Talk to your doctor and the technicians performing the test about whether you are or could be pregnant. If the test is not urgent, they may have you wait to do the test until after your pregnancy. If it is urgent, the technicians will take extra steps to protect your baby during this test. Let your doctor know if you are breastfeeding because contrast dye can pass into your breast milk. People with asthma, chronic obstructive pulmonary disorder COPD , or heart failure may have breathing problems during cardiac CT scans if they are given beta blockers to slow their heart rates for this imaging test. Learn more about participating in a clinical trial. View all trials from ClinicalTrials. Visit Children and Clinical Studies to hear experts, parents, and children talk about their experiences with clinical research.

Chapter 3 : Clinical Cardiac CT PDF

State-of-the-art cardiac CT imaging in a concise textbook format This textbook atlas is designed to provide the tools to confidently perform and accurately interpret CT imaging of cardiac anatomy and function.

Find articles by Ethan J. Abstract ECG-gated multislice CT provides a cost-effective, non-invasive technology for evaluation of the coronary arteries, as well as for additional clinical applications, which require morphological assessment of the heart and adjacent structures with simultaneous evaluation of the coronary circulation. The excellent negative predictive value of a normal coronary CTA cCTA examination excludes the presence of significant coronary disease in the symptomatic patient. Triple rule-out studies provide evaluation of the aorta and pulmonary arteries without loss of image quality in the coronary circulation. The ability to visualize surrounding vascular structures along with the coronary arteries is essential in the evaluation of coronary anomalies. Cardiac CTA is useful in non-coronary applications, including evaluation of the thoracic aorta, cardiac valves and other aspects of cardiac morphology that may require surgical or percutaneous repair. Recent advances in evaluation of coronary plaque morphology as well as myocardial perfusion will allow a more complete noninvasive cardiac assessment in the future and may provide a highly effective method of cardiac risk stratification to facilitate preventive cardiac care. CT angiography, Cardiac imaging Introduction The advent of multislice CT technology with ECG-gating along with innovations in x-ray tube and CT detector technology have resulted in revolutionary progress in cardiac imaging. Recent studies suggest additional applications of CT for assessment of myocardial perfusion and cardiac event risk. Numerous studies suggest that cCTA is a cost-effective alternative to the nuclear stress test and diagnostic cardiac catheterization. Although CT angiography has replaced conventional arteriography for most visceral applications, issues related to radiation exposure and functional versus anatomical information have been raised as objections to widespread adoption of cCTA. Recent advances in CT imaging methodology and CT image reconstruction algorithms address many of these concerns. This review explores a variety of clinical applications of cardiac CT. The primary focus is on cCTA with a review diagnostic accuracy, appropriate clinical indications and limitations for evaluation of the coronary arteries. Although the principle indication for cardiac CT is most often for evaluation the coronary arteries, cCTA is often requested for the dual purposes of non-coronary and coronary evaluation. Several of the more common non-coronary applications are reviewed, although a complete review of these applications is beyond the scope of this pictorial essay. Atherosclerotic disease of the coronary arteries remains the most important etiology of heart disease. Coronary computed tomographic angiography cCTA provides a non-invasive alternative to cardiac catheterization for direct visualization of coronary anatomy Fig. The high sensitivity of cCTA for CAD results in an extremely high negative predictive value, especially in patients with low to intermediate risk of coronary disease. Although the specificity of cCTA is limited by arterial calcification, post-processing techniques using vessel tracking and curved multiplanar reconstructions are often useful for evaluation of calcified vessels Fig. Nonetheless, blooming artifact associated with densely calcified plaque may preclude visualization of the underlying vascular lumen in the absence of significant stenosis Fig.

Chapter 4 : Cardiac CT | Radiology

The Recent Advances in Clinical Nuclear Cardiology and Cardiac CT Meeting on Demand, Program is perfect for you if you are. Wanting to have the latest information in nuclear cardiology and cardiac CT presented in compact 20 minute segments by a superb faculty.

Print Overview A computerized tomography CT coronary angiogram is an imaging test that looks at the arteries that supply blood to your heart. It might be used to diagnose the cause of chest pain or other symptoms. A CT coronary angiogram relies on a powerful X-ray machine to produce images of your heart and its blood vessels. Coronary CT angiograms are increasingly an option for people with a variety of heart conditions. A traditional not CT-based coronary angiogram requires that a flexible tube catheter be threaded through your groin or arm to your heart or coronary arteries. If you have known coronary artery disease, your doctor might recommend a traditional coronary angiogram because you can also receive treatment during that procedure. If your test suggests that you have heart disease, you and your health care provider can discuss treatment options. The amount varies depending on the type of machine used. How you prepare Your doctor should give you instructions about how to prepare for your CT angiogram. You can drink water, but avoid caffeinated drinks 12 hours before your test, because they can increase your heart rate, which can make it difficult for your doctor to get clear pictures of your heart. What you can expect CT angiograms are usually performed in the radiology department of a hospital or an outpatient imaging facility. Before the procedure Your doctor might give you a medication called a beta blocker to slow your heart rate, enabling the scan to produce a clearer image. You might also be given nitroglycerin to widen dilate your coronary arteries. Although the actual scanning portion of the test takes as few as five seconds, it may take up to an hour for the whole process. The technician will place electrodes on your chest to record your heart rate. There will be an intercom system that allows you and the technician to communicate with each other. After the procedure After your CT angiogram is completed, you can return to your normal daily activities. You should be able to drive yourself home or to work. Drink plenty of water to help flush the dye from your system. The images from your CT angiogram should be ready soon after your test. Usually, the health care provider who asked you to have a CT angiogram should discuss the results of the test with you. Exercise helps you reach and maintain a healthy weight and control diabetes, elevated cholesterol and high blood pressure – all risk factors for heart disease. If necessary, break your activity into several minute sessions a day. A heart-healthy diet based on fruits, vegetables and whole grains – and low in saturated fat, cholesterol and sodium – can help you control your weight, blood pressure and cholesterol. Smoking is a major risk factor for heart disease, especially atherosclerosis. If you smoke, quitting is the best way to reduce your risk of heart disease and its complications. Maintain a healthy weight. Excess weight can contribute to high blood pressure, abnormal cholesterol levels and type 2 diabetes. Losing weight, even a small amount, lessens these risks. If you have high blood pressure, elevated cholesterol or diabetes, take your medications as directed. Ask your doctor how often you need follow-up visits. Stress can cause your blood vessels to constrict, upping the odds of a heart attack. Ask your doctor about stress management programs in your area. Exercise can help reduce stress too. Clinical trials Explore Mayo Clinic studies testing new treatments, interventions and tests as a means to prevent, detect, treat or manage this disease.

Chapter 5 : Clinical applications of cardiac CT angiography

It is intended for residents, fellows, practitioners who wish to add cardiac CT to their practice, and experienced cardiac imagers who require a reference. The book is organized into 12 chapters. It begins with the fundamental techniques of CT angiography, normal coronary anatomy, and anatomic variations.

Chapter 6 : Clinical Cardiac CT: Anatomy and Function - Ethan J. Halpern - Google Books

Among the clinical applications of cardiac CT, coronary CT angiography (cCTA) remains the most widespread and most controversial. Numerous studies suggest that cCTA is a cost-effective alternative to the nuclear stress test and diagnostic cardiac catheterization.

Chapter 7 : Cardiac CT Scan | National Heart, Lung, and Blood Institute (NHLBI)

A calcium score is a specialized cardiac CT without contrast that is processed with software to quantify the amount of coronary calcium. This number, the Agatston score, is used as a surrogate for the total amount of coronary plaque and is correlated with patients of the same age and gender.

Chapter 8 : Internal Medicine | Clinical Cardiac CT

A cardiac CT scan is an imaging test that uses X-rays to take many detailed pictures of your heart and its blood vessels. This test can help diagnose or evaluate ischemic heart disease, calcium buildup in the coronary arteries, problems with the aorta, problems with heart function and valves, and pericardial disease.

Chapter 9 : VIDEO: How to Prepare a Patient for a Cardiac CT Scan | DAIC

A computerized tomography (CT) coronary angiogram is an imaging test that looks at the arteries that supply blood to your heart. It might be used to diagnose the cause of chest pain or other symptoms.