Daniel Berman, M.D., discusses a new low-dose coronary CT angiogram machine that is non-invasive and reduces radiation exposure...

How is the low-dose coronary CT angiogram different than past angiogram machines?

Dr. Berman: In the past, in order to get a coronary angiogram someone had to have a catheter fed up through the leg into the region of the heart and selectively the individual coronary arteries would be injected with contrast. That is called an invasive coronary angiogram. This is now providing us the opportunity to have a non-invasive coronary angiogram.

How does the new angiogram work?

Dr. Berman: A sophisticated rapid CT scan images the area of the heart fast enough to get stop-action images of the coronary arteries, when this injected contrast is put into vein and is flowing through the coronary arteries. The images give us exquisite detail of the coronary anatomy so we can see blockages of arteries that previously required invasive coronary and geography to detect.

What is the main difference between the old and new methods?

Dr. Berman: The main difference over the last few years is we now have ways of doing this non-invasively, whereas before we had to do invasive coronary angiography. Recently, what we have added is the ability to do these tests with a markedly reduced radiation dose to the patient.

What did you see in Darlene's heart when she received a low-dose angiogram?

Dr. Berman: She was a woman who had very unusual symptoms, even though the symptoms were related to decreased blood flow to the heart muscle. It turns out it is not uncommon for women to have different kinds of symptoms than men. She described her heart as turning and I had no idea what it meant to have her heart turn; but, what happened was she had been seen in the emergency department, tested and sent home. Then a few days later she was sent in for a coronary calcium scan. One of the people working here recognized this was a woman with a positive family history for early heart disease who previously had a coronary calcium scan. The assistant thought probably the coronary calcium scan isn't going to give the information they need and they asked me to see the patient. I walked in the room, talked to her for a bit and realized the test she really needed was this CT coronary angiogram.

Why wouldn't the coronary calcium scan show what you needed to see?

Dr. Berman: Coronary calcium scan has been around for over a decade now and it allows us to detect calcified plaques within the coronary tree. The plaques are indications that the patients have coronary
arthrosclerosis or plaque buildup in the arteries, but the calcium alone gives us no indication as to whether an artery is actually obstructed. The obstructed arteries are the most dangerous ones and they cause symptoms. In order to see an obstructed coronary artery, we had to inject contrast medium into the veins, allowing us to see in the inner lining of the blood vessel.

Does this work well with someone who comes in complaining of symptoms?

Dr. Berman: Most of the time, we are using coronary calcium scanning in patients who have no symptoms, but have risk factors suggesting they might be at risk for heart attacks. Then we decide how aggressively to treat them with medications; but when patients get symptoms, we realize we really need to see whether or not there is a blockage in the vessel and the CT coronary angiogram becomes an excellent test.

Why was it so difficult to pick this up with the other tests she had done?

Dr. Berman: She had a resting scan of her heart and at rest the heart muscle blood flow was normal. We tried to do an exercise test on her, but when she exercised, she couldn't keep her heart rate up much on the treadmill. Unless you really stress the heart with a high heart rate, it can look as though the heart muscle blood is normal when an obstruction is actually present.

Would you say this machine actually saved her life?

Dr. Berman: It's hard to know whether a heart attack in the obstructed vessel would actually have been life threatening. The area involved was small enough that she may have survived a heart attack in that region, but many times we cannot tell. It would be quite possible if a person has a heart attack in a small distribution that an irregularity of heart contraction could occur which is essentially associated with sudden death. If there are people around who know CPR, they could save that person, but if it's not witnessed it could be deadly.

How does it make you to have a machine like that at your hands now?

Dr. Berman: It's marvelous. I just wish society would understand a little more about the value of this test and allow doctors to use it more easily when it is appropriately indicated.

Do you recommend people who don't have symptoms have this test done as a precaution?

Dr. Berman: For people without symptoms who have risk factors for coronary disease, I would recommend just the coronary calcium scan. That is good enough and we don't need to have the extra contrast injection and the extra cost associated with this test; however, when people have symptoms, this is a very reasonable test to be performing. Right now, it's not covered by all insurances, so we have to be careful in terms of checking out the policy of a given patient before we can proceed with this unusual and sophisticated form of cardiac imaging.

How much is the radiation reduced by?

Dr. Berman: There has been a lot of press coverage about the radiation dose associated with CT coronary angiography. The way we do it at Cedar Sinai reduces that radiation by 75 percent. The radiation dose of this scan is getting close to the small dose that we use with the coronary calcium scan.

END OF INTERVIEW

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