CORONARY ARTERY ANEURYSMS

KAWASAKI DISEASE RESEARCH CENTER
RADY CHILDREN'S HOSPITAL/UCSD

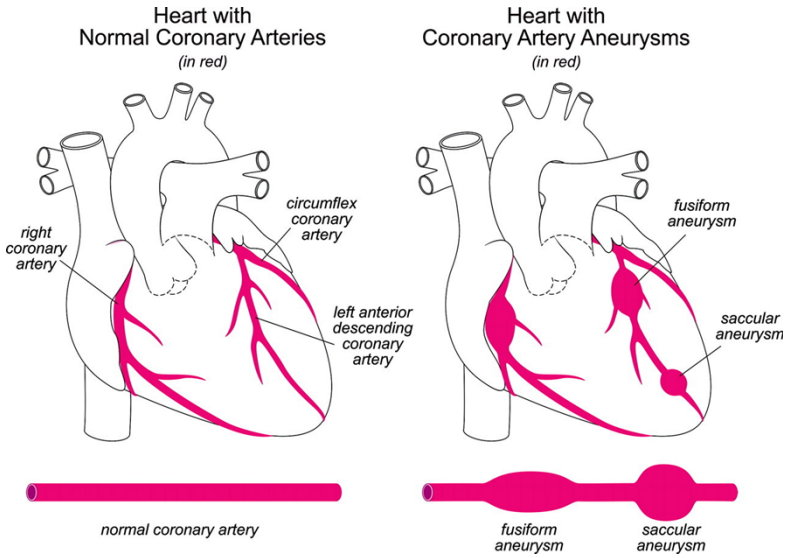
What are the coronary arteries?

The coronary arteries are blood vessels that supply the heart muscle with oxygen-rich blood. There are two main coronary arteries:

- ***Left Coronary Artery***: supplies blood to the front and left side of the heart quickly branching into two arteries, the Left Anterior Descending Artery and the Circumflex Artery
- ***Right Coronary Artery***: supplies blood to the right side and bottom of the heart**.**

What is a coronary artery aneurysm?

A coronary artery aneurysm is a bulge or ballooning in the wall of a coronary artery, which can disrupt blood flow and potentially lead to heart problems. An aneurysm of 8 mm or more is defined as a ***giant coronary artery aneurysm.***



What are the possible heart problems caused by giant coronary artery aneurysms?

- ***Thrombosis***: Blood clots can form within the aneurysm, blocking blood flow and possibly causing a heart attack.
- ***Stenosis***: Aneurysms can remodel with buildup of scar tissue inside the wall of the vessel that creates narrowing and decreases the blood flow.
- ***Recanalization***: The body may create new blood channels through the clotted area, partially restoring blood flow.
- ***Collaterals:*** New blood vessels can develop around the blocked artery to bypass the aneurysm and help supply blood to the heart muscle.
- ***Rupture (very rare)***: The aneurysm can burst, leading to severe internal bleeding, which is a life-threatening condition.

Management and Treatment:

Treatment involves medications to prevent blood clots (anti-platelet drugs, systemic anti-coagulants including Lovenox and direct oral anticoagulants), as well as occasionally medications to prevent rapid heart rates (beta-blockers) and medications to promote healing of the endothelial cells that line the artery wall (statins). Rarely, treatment may involve interventions via a catheter or surgery, depending on a number of factors including age/size of the patient, size and location of the aneurysm, and symptoms or evidence for insufficient blood flow to the heart muscle (ischemia).

STRESS ECHO

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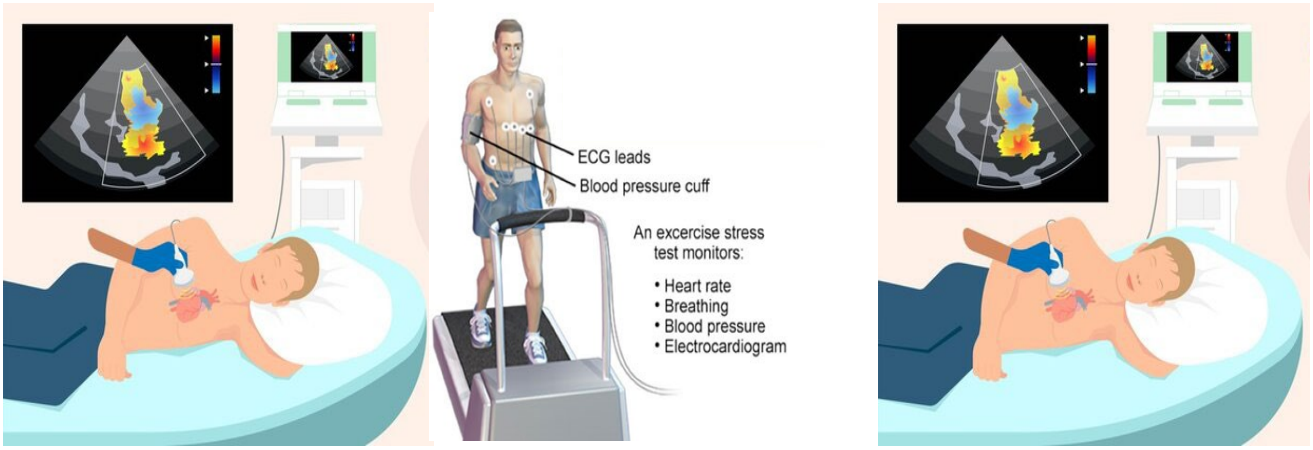
What is a Stress Echo?

A stress echo is a test that shows how well your heart is working when it's beating fast. You create this "stress" by exercising on a treadmill or bicycle.

When is a stress echo test performed?

A stress echo is a functional test to assess blood flow to the heart during maximum exercise. For example, if you have a partially blocked coronary artery, the muscle tissue that receives blood from that artery may not function well under stress. By comparing echocardiogram images under stress with those at rest, your physician can see this change in muscle function.



What can I expect during the exercise stress echocardiogram?

- Stickers containing electrodes are attached to monitor your heart rate, and a blood pressure cuff tracks your blood pressure.
- Initially, while resting, an electrocardiogram (EKG) and echocardiogram are performed.
- You then exercise on a treadmill or stationary bike, slowly increasing the intensity until your heart is pumping hard.
- Once your heart is pumping rapidly, another echocardiogram is performed.
- The entire test typically lasts about an hour.

CT CALCIUM SCORE

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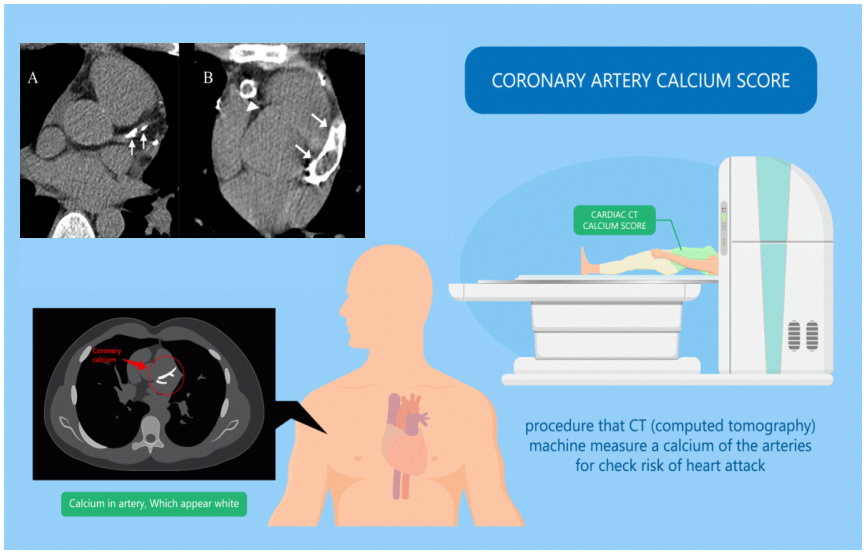
What is a CT Calcium Score?

A calcium score is generated by a Computed Tomography (CT) scanner that uses low amounts of radiation to measure the amount of calcium in your coronary arteries. The scan is relatively low-cost and does not require dye injection through an IV. The calcium score is used to screen for damage to the arteries as a result of Kawasaki disease in childhood. For young adults, a normal result is a calcium score of zero.

Why is a CT Calcium Score important in Kawasaki disease patients?

Calcium in your coronary arteries indicates scarring from previous damage from KD in childhood. The calcium score in young adults with otherwise healthy hearts should be zero.



When is a CT Calcium score recommended?

- All young adults after KD with an uncertain status of their coronary arteries should have a CT calcium score.
- Adults who had their KD before 2000 and were told their echocardiogram was normal should consider requesting a CT calcium score because the echocardiograms in that era may not have been very accurate.
- Adolescents/young adults with history of giant or moderate aneurysms ~ 10 years after the acute KD illness

For adults after KD who already know that they have coronary artery aneurysms, the calcium score is performed at the same time as a CT angiogram that gives more detailed information about the state of the arteries.

If the Results are Abnormal, what are the Next Steps?

If the results are abnormal (a calcium score >0), your primary care provider should refer you to a cardiologist who will recommend a more detailed study (CT angiography) to better define the problem in the coronary arteries. The cardiologist may also recommend medications pending more detailed information from the CT angiogram.

CT ANGIOGRAPHY

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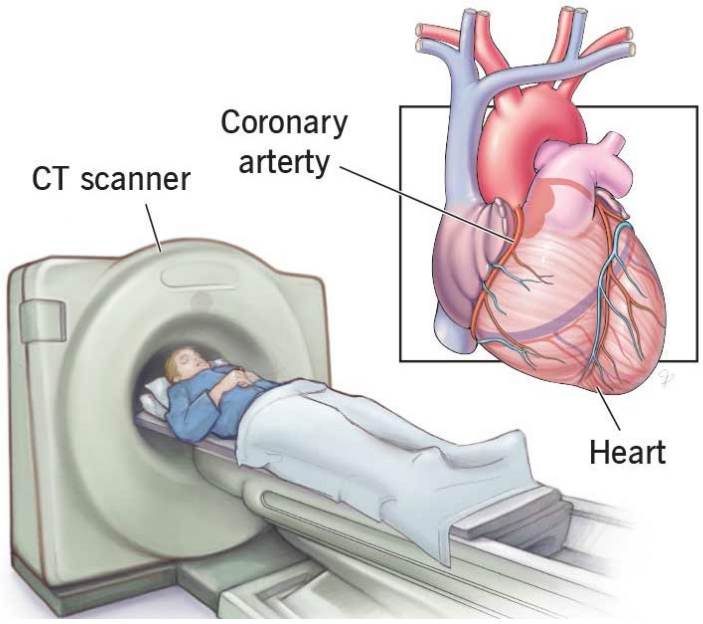
What is CT angiography (CTA) of the coronary arteries?

Computed tomography angiography (CTA) is a medical imaging test that uses X-rays and a special dye to capture detailed pictures of the blood vessels in the heart.



When is a CT angiogram recommended?

CT angiography may be recommended if other tests like echocardiograms suggest there could be problems with the coronary arteries. It provides more detailed images to help doctors evaluate the extent of arterial damage.

Is CT angiography safe?

Yes, CT angiography involves exposure to a very small dose of radiation. Reaction to the dye is very rare.

References

1. Gordon, J.B. and J.C. Burns, *Management of sequelae of Kawasaki disease in adults.* Glob Cardiol Sci Pract, 2017. **2017**(3): p. e201731.

2. Kahn, A.M., et al., *Usefulness of Calcium Scoring as a Screening Examination in Patients with a History of Kawasaki Disease.* Am J Cardiol, 2017. **119**(7): p. 967-971.

3. Baker, A.L. and J.W. Newburger, *Cardiology patient pages. Kawasaki disease.* Circulation, 2008. **118**(7): p. e110-2.