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What is percutaneous transluminal coronary angioplasty (PTCA)?

Percutaneous transluminal coronary angioplasty (PTCA) opens blocked coronary arteries caused by coronary artery disease (CAD) and restores arterial blood flow to the heart tissue without open-heart surgery. CAD is the narrowing of the coronary arteries (the blood vessels that supply oxygen and nutrients to the heart muscle), caused by a buildup of fatty material within the walls of the arteries. This buildup causes the inside of the arteries to become rough and narrowed, limiting the supply of oxygen-rich blood to the heart muscle.

How does the procedure work?

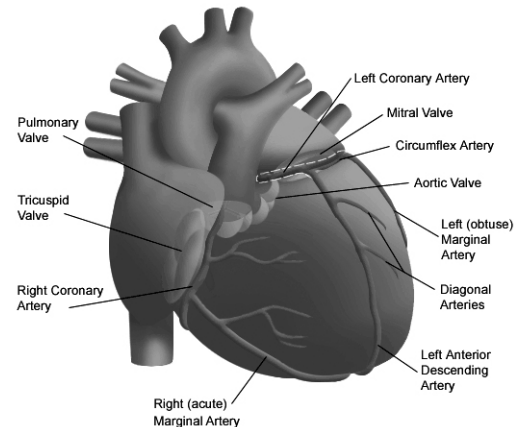
In a PTCA procedure, a special catheter (a long, hollow tube) is inserted into the coronary artery to be treated. This catheter has a tiny balloon at its tip. The balloon is inflated once the catheter has been placed into the narrowed area of the coronary artery. The inflation of the balloon compresses the fatty tissue in the artery and makes a larger opening inside the artery for improved blood flow.

The use of fluoroscopy (a special type of x-ray, similar to an x-ray "movie") assists the physician in the location of blockages in the coronary arteries as the contrast dye moves through the arteries. A small sample of heart tissue (called a biopsy) may be obtained during the procedure to be examined later under the microscope for abnormalities.

A technique called intravascular ultrasound (IVUS) uses a computer and a transducer that sends out ultrasonic sound waves to create images of the blood vessels. The use of IVUS provides direct visualization and measurement of the inside of the blood vessels and may assist the physician in selecting the appropriate size of balloons and/or stents, to ensure that a stent, if used, is properly opened, or to evaluate the use of other angioplasty instruments.

The physician may determine that another type of procedure is necessary. This may include the use of atherectomy (removal of plaque) at the site of the narrowing of the artery. In atherectomy, there may be tiny blades on a balloon or a rotating tip at the end of the catheter. When the catheter reaches the narrowed spot in the artery, the plaque is broken up or cut away to open the artery. Atherectomy is used when the plaque is calcified, hardened, or if the vessel is completely closed. Another type of atherectomy procedure uses a laser, which opens the artery by "vaporizing" the plaque.

Anterior View of the Heart



What is stent placement?

One common procedure used in PTCA is stent placement. A stent is a tiny, expandable metal coil that is inserted into the newly-opened area of the artery to help keep the artery from narrowing or closing again.

Once the stent has been placed, tissue will begin to form over it within a few days after the procedure. The stent will be completely covered by tissue within a month or so. It is necessary to take a medication, such as aspirin or clopidogrel (Plavix™), which decreases the "stickiness" of platelets (which clump together to form clots to stop bleeding), in order to prevent blood clots from forming inside the stent.

Risks of the Procedure

Possible risks associated with PTCA, atherectomy, and/or stent placement include, but are not limited to, the following:

- bleeding at the catheter insertion site (usually the groin, but the arm may be used in certain circumstances)
- blood clot or damage to the blood vessel at the insertion site
- blood clot within the vessel treated by PTCA/stent
- infection at the catheter insertion site
- cardiac dysrhythmias/arrhythmias (abnormal heart rhythms)
- myocardial infarction
- chest pain or discomfort
- rupture of the coronary artery, requiring open-heart surgery



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There may be other risks depending upon your specific medical condition. Be sure to discuss any concerns with your physician prior to the procedure.

insertion site or having to lie flat and still for a prolonged period. You will be encouraged to drink water and other fluids to help flush the contrast dye from your body.

Before the Procedure

- You will need to fast for a certain period of time prior to the procedure. Your physician will notify you how long to fast, whether for a few hours or overnight.
- Notify your physician:
 - if you have ever had a reaction to any contrast dye, or if you are allergic to iodine or seafood.
 - if you are sensitive to or are allergic to any medications, latex, tape, and anesthetic agents (local and general).
 - if you have any body piercings on your chest and/or abdomen.
 - of all medications (prescription and over-the-counter) and herbal supplements that you are taking.
 - if you have heart valve disease, as you may need to receive an antibiotic prior to the procedure.
 - if you have a history of bleeding disorders or if you are taking any anticoagulant (blood-thinning) medications, aspirin, or other medications that affect blood clotting.
 - if you have a pacemaker.
 - if you are pregnant or suspect that you may be pregnant.
- Your physician may request a blood test prior to the procedure to determine how long it takes your blood to clot.
- You may receive a sedative prior to the procedure to help you relax.
- The area around the catheter insertion (groin area) may be shaved.

After the Procedure

Bedrest may vary from two to six hours depending on your specific condition. You may be given medication for pain or discomfort related to the