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Heart to Heart

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Coronary Angioplasty

What is Coronary Angioplasty?

Commonly called angioplasty, the procedure is technically known as Percutaneous Transluminal Coronary Angioplasty (PTCA). Percutaneous refers to “the needle puncture thru the skin,” transluminal means “the inside channel of the artery,” coronary is the name of the “arteries to of the heart,” and angioplasty is “repair/dilatation” of the blocked artery, using an inflatable balloon.

So why the name PTCA?

In layman’s term, PTCA means a soft plastic sheath-enclosed needle is inserted thru the skin of the groin, into the channel of the femoral artery, and threading a spaghetti-like catheter thru that sheath, pushing it up all the way to the ascending aorta (the huge main artery in the chest connected to the heart, thru which blood passes when the heart contracts). At the base of this aorta, near its connection to the heart, are two arterial (left and right coronary) branches that supply the muscles of the heart. The tip of the catheter is inserted into the left and then to the right coronary arteries, where radio-opaque dye is injected, and a video records the flow of the dye in the coronary circulation. This procedure is popularly known as cardiac catheterization or coronary angiogram/arteriogram. Any blockage or abnormality in the coronary arteries, the strength of heart contraction/or heart muscle weakness, are all recorded on the video, which information are important in the diagnosis and treatment of the patient. The angioplasty portion is described below.

How is angioplasty done?

Once a significant blockage (more than 50% obstruction of the arterial channel) is detected by the coronary angiogram in a patient with chest pains, the cardiologist doing the procedure gets a special catheter that has an inflatable balloon towards the tip. The angiogram catheter is pulled out and the special balloon catheter is inserted to the femoral artery thru the same sheath. The balloon is still deflated at this time as the catheter is directed into the blocked artery under continuous X-ray guidance. Once the balloon is inside the segment of the artery that

is tightly blocked, the balloon is inflated to push open the obstructed artery. This dilates the narrowed segment. A stainless steel stent (a tiny spiral coil spring) is then inserted within that dilated segment to prevent the walls from collapsing (re-blocking) the lumen of the artery.

What causes coronary artery blockage?

Cholesterol from the food we eat, smoking, lack of exercise, genetic predisposition – all these cause our blood to thicken and clot within the coronary (and other) arteries, and the resultant cholesterol plaques obstruct the artery. If the coronary arteries are severely blocked, then the heart muscles do not get enough blood and oxygen, and this leads to angina (chest pains), and in some cases, a heart attack. This is why we recommend lifestyle changes like quitting cigarettes, low cholesterol diet (fish, vegetables and fruits, preferably no red meat, like pork and beef, and no eggs), and doing daily exercises. All this will minimize cholesterol plaque formation inside the arteries and prevent heart attack and stroke.

Can PTCA be done on an outpatient basis?

Yes, this procedure is being done in some centers in the United States as an outpatient procedure, where it is done in the morning, and the patient is discharged the same evening. Some cases are kept overnight for observation. The decision is based on the patient's condition, the nature of the blockages, the response to the angioplasty and the presence or absence of any complication.

Is the patient put to sleep for the angioplasty?

No, it will be more risky to give general anesthesia for this procedure. Nobody does that. The accepted standard of practice for this procedure all over the world uses moderate sedation for the patients, keeping them comfortable and less anxious, plus local anesthetic injection to numb the area in the groin where the sheathed needle is to be inserted. This is the safe technique which has been proven in hundreds of thousands of cases and well accepted by patients around the globe.

What are the possible complications?

More common possible complications of coronary angiogram include allergy to the dye, bleeding in the puncture site in the groin, hematoma (blood clots) under the skin in the groin, blood clot within the artery (thrombus-embolus) that cuts off the leg circulation, and irregularity of the heart beat. For angioplasty, all the above possible risk plus tear in the artery being ballooned, causing bleeding or even dissection (where part of the hardened wall of the artery cracks during balloon

dilatation and blocks the entire artery, cutting off circulation to the heart muscles, leading to a heart attack in some cases. But in experienced hands, these complications are rare, and the procedure is medically safe.

Is angioplasty a substitute for Bypass?

No. While angioplasty is a lot less invasive a procedure compared to heart bypass surgery, it is not beneficial and not indicated for all cases of coronary arterial blockages. There are arteries that are so severely blocked and hardened that the balloon cannot dilate or open them. When multiple coronary arteries are severely blocked and the anatomy is not amenable to angioplasty, coronary bypass surgery is the safer and prudent choice. When the blocked vessel is the left main coronary artery, which is a life-sustaining artery, then bypass surgery is the accepted and the uncontested standard of treatment. Cases are individualized based on many complex, some subtle, medical factors, and in some situations, also on the patient's preference, so long as it is medically reasonable.

What is sirolimus-coated stent?

A new stent, coated with sirolimus (rapamycin), has been reported June 6, 2002 in the New England Journal of Medicine as being much superior to the currently used stents. The sirolimus stent has been found in independent studies (in Europe, Brazil and in the USA) to lower the current re-stenosis (re-blockage) rate of 35% to 50% within six months after the angioplasty, to almost 0% in 6 months. In other words, practically all patients studied on whom the sirolimus stent was used had patent (opened) arteries after six months. More recent studies have shown that the re-stenosis rate was higher than originally suspected, but still much lower than with the use of the old "non-coated" stents. Extensive clinical studies and trials are being done all over the world. We look forward to the progress of this investigation with eager anticipation.