

Percutaneous Coronary Intervention (PCI)

Introduction

Percutaneous coronary intervention (PCI) is a procedure used to dilate and maintain patency for any narrowing of the coronary arteries (arteries supplying blood to heart muscle). This procedure is performed with the use of X-ray through percutaneous method (commonly through femoral or radial arteries).

Importance of Procedure

PCI is an invasive procedure that may follow coronary angiogram. Coronary angiogram provides a clear picture of the severity and location of narrowing in the coronary arteries. The procedure may follow directly after diagnostic coronary angiogram. PCI serves to open up the artery and improve heart function. In emergency situation caused by acute coronary syndrome (heart attack), this procedure is important and can be life-saving. If this procedure is refused, the consequence can be detrimental. Alternative treatment modalities include bypass surgery or medical therapy. Please consider different options carefully and ask your doctor for details.

Pre-Procedure Preparation

- You will be invited to a ward or a clinic for some preliminary tests including electrocardiogram, and blood tests. We will also check your allergy history.
- Our medical staff will explain to you and your relatives the procedure and its risks, and present to you this information leaflet. You have to sign an informed consent.
- Blood thinning drug (Novel oral anticoagulant/ Direct oral anticoagulant) or diabetic drugs (metformin) may have to be stopped several days before the procedure. Special anti-platelet drugs (Clopidogrel, or Ticagrelor) should be taken before the intervention. Steroid will be given if there is history of allergy.
- Fasting of 4-6 hours is required prior to the procedure. An intravenous drip will be set up. Shaving may be required over the puncture site.
- If you are a female, please provide your last menstrual period (LMP) and avoid pregnancy before the procedure as this procedure involves exposure to radiation.

The Procedure

- This is an invasive procedure performed under local anesthesia in a cardiac catheterization centre.
- Electrodes are adhered to the chest to monitor the heart rate and rhythm. Blood oxygen monitor through your finger tip will be set up. Blood pressure will be measured from your arm at regular intervals during the examination.
- A small wound is made either from the groin or around the wrist for access to arteries or veins.
- Catheters are advanced to the heart under X-ray guidance.

- Contrast is injected into coronary arteries and films are taken using X-ray. Narrowing in the coronary arteries is identified.
- In general, a special catheter is placed at the opening of the coronary artery with narrowing. A thin guide wire is advanced across the narrowing. The guide wire serves as a track to allow a balloon to go to the narrowing. The balloon is inflated to open up the artery. A metallic stent is then implanted permanently inside the artery to keep it patent.
- Other techniques may be adopted to improve the success and outcome of the procedures. Please discuss with your doctor about the specific devices/instruments involved as new advances in PCI cannot be fully discussed in this leaflet.
- During the procedure, you may be asked to hold your breath or cough. Transient chest pain may be experienced during the procedure. If you experience severe or persistent chest pain, dizzy spell or any discomfort, you need to inform the staff.

Post-Procedure Care

- After the procedure, catheters will be removed. The wound site might be compressed or sutured to stop bleeding. Sometimes, special devices may be used to stop bleeding.
- Nursing staff will check your blood pressure, pulse and wound regularly.
- Bed rest is necessary for a few hours. In particular, please do not move or bend the affected limb. If the wound is over the groin, please apply pressure with your hand when you cough or sneeze so as to avoid re-bleeding.
- You should inform your nurse if you have any discomfort; particularly chest discomfort or find blood oozing from the wound site.

Post-Procedure Follow Up

- Usually, you can be discharged 1 day after the procedure.

It is very important that you follow the exact prescription of antiplatelet drugs (aspirin, clopidogrel or ticagrelor) by your doctor. Premature termination of antiplatelet drugs can lead to fatal blood clots in your stents.

- The wound will be inspected and covered with light dressing. Please keep the wound site clean and change dressing if wet. In general, shower is allowed after 1-2 day. Please avoid vigorous activities (household or exercise) in the first few days after the procedure. Bruising around the wound site is common and usually subsides 2-3 weeks later. If you notice any signs of infection, increase in swelling or pain over the wound, please come back to the hospital or visit a nearby Accident and Emergency Department immediately.

- Usually, your doctor has explained to you the results of the procedure before discharge. Should you have further questions, you and your close relatives can discuss with your doctor during subsequent follow-up.

Risks and Complications

- The procedure carries certain risks which vary according to patient factors, lesion factors and clinical circumstances. For instance, PCI in high risk clinical situation like heart attack with shock (unstable blood pressure and rhythm) is risk but successful PCI can be lifesaving. Please consult your doctor for individual assessment.
- The chance of having major complication is generally considered to be higher during heart attack. Particularly, in case of cardiogenic shock, the risk of dying or major complication can be more than 50%.
- Major complications include death 1.27% (range 0.65-4.81%), periprocedural myocardial infarction (less than 15%), stroke (0.2%) and emergency bypass surgery (0.4%). (Reference 1) Other major complications include coronary artery perforation, heart failure, arrhythmias, vascular complications, contrast related anaphylaxis, acute renal failure.
- Minor complications include contrast allergy, nausea, or wound complications. Bruising around the wound site is common.
- Re-narrowing of the dilated or stented coronary lesion might occur in 10% of the cases, but the rate had reduced significantly with latest generation of stent to ~ 5-10 %. The rate varies according to many different factors.
- Other potential risks include air embolism resulting in death or neurological damage, retained foreign body such as guide wires.
- Device deployment complications include device dislodgement, device entrapment and wire fracture.

Fees and Charges

- This procedure involves the use of consumables which are 'Privately Purchased Medical Items'. Please make financial arrangement before the procedure.
- You need to pay an estimated deposit. The final charge, however, depends on the complexity of the procedure and range of consumables required.
- After the procedure, you may need to pay the balance to or collect refund from the account office.
- Please note that the procedure may need to be staged or repeated for various reasons. Separate charging is required for each procedure.
- If you have financial difficulty, you can apply for assistance through our medical social worker.

Remarks

- It is hard to mention all the possible consequences if this procedure is refused.
- The list of complications is not exhaustive and other unforeseen complications may occasionally occur. The risk quoted is in general terms. In special patient group (e.g. diabetics), the actual risk may be higher.
- Should a complication occur, another life-saving procedure or treatment may be required immediately.
- If there is further query concerning this procedure, please feel free to contact your nurse or your doctor.

Reference

1. ACC/AHA/SCAI 2011 guideline Update for Percutaneous Coronary Intervention, Glenn N. Levine et al.
2. ACC/AHA/SCAI 2021. Guideline for Coronary artery Revascularization, Jenifer, Lawton, Jacqueline et al.
3. Trends in U.S. Cardiovascular Care: 2016 Report From 4 ACC National Cardiovascular Data Registries JACC 2017 Mar 21;69(11):1427-1450.