

## **Cardiac Catheterization and Coronary Angiogram**

### **Introduction**

Cardiac catheterization is used to investigate the structure and function of the heart. Coronary angiogram is used to investigate for any narrowing of the coronary arteries (arteries that supply blood to heart muscle). Both procedures are performed with the use of X-ray. Apart from exceptional cases, both procedures can be performed together.

### **Importance of Procedure**

This is an invasive procedure. Cardiac catheterization can provide in-depth and specific information of various cardiac diseases. We can measure the pressure in various heart chambers and calculate heart function. Coronary angiogram can provide a clear picture of the severity and location of narrowing in the coronary arteries. These can help doctor formulate the plan of management. In emergency situation caused by acute coronary syndrome (heart attack), the procedure is important in diagnosis. It is also a stepping stone to coronary intervention which serves to open up the artery and improve the heart function. This approach, despite its invasiveness, can be life-saving and the consequence can be detrimental if it is delayed. Even though there exists other alternative investigative tools, the information they provide are indirect and less specific. (Please 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. These can be performed days before the procedure or on the day of admission.
- Our medical staff will explain to you and your relatives the details of the procedure together with the possible risks and complications. This information leaflet will be provided. You have to sign an informed consent.
- Blood thinning drug (warfarin) or diabetic drug (metformin) may have to be stopped several days before the procedure. Special anti-platelet drug should be taken if PCI is also planned. Steroid will be given if there is history of allergy.
- Fasting of 4-6 hours is required prior to the elective procedure. An intravenous drip may 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 procedure is performed under local anesthesia or conscious sedation (Reference 1) in a cardiac catheterization centre. You are awake during the procedure, but we may give you sedation to calm you down.

- Electrodes are adhered to the chest to monitor the heart rate and rhythm. Blood oxygen monitor through your finger tip will be set up. Measurement of blood pressure from your arm will be taken during the examination.
- A small wound is made over the groin, wrist or neck for access to arteries or veins.
- Catheters are advanced to the heart under X-ray guidance.
- Pressures within the heart are measured. Blood samples may be drawn from various heart chambers to determine their oxygen saturation.
- Contrast is injected and films are taken.
- During the procedure, you may be asked to hold your breath or cough. You may experience a hot flush feeling when contrast is injected.

### Post-Procedure Care

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

### Post-Procedure Follow Up

- Usually you can be discharged on the same day or one day after the procedure.
- 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 days.
- 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.
- Minor complications include allergic contrast reaction, nausea, and wound complications.
- Total major complications account for <1%. These include death (0.1%), myocardial infarction (<1%), stroke (0.1-0.6%), perforation of heart chamber, aortic dissection and severe bleeding.

- Other major complications include arrhythmias, vascular complications, anaphylactic reaction to contrast, contrast nephropathy and hemodynamic complications. (Reference 2)
- 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.

### 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. Clinical Appropriateness Guidelines: Diagnostic Coronary angiography. AIM Specialty Health, Effective Date: January 2, 2018.
2. Complication of diagnostic cardiac catheterization: UpToDate, topic last updated May 10, 2017.