Transcatheter Tricuspid Valve Repair

Introduction

The heart has four chambers, the upper two heart chambers are called atria; and the lower two heart chambers are called ventricles. All of the valves only open in one direction, allowing blood flow from one chamber to another and prevent the backflow of blood during each heat beat. Tricuspid valve lies between the right atrium and the right ventricle of the heart. During diastole, a normally-functioning tricuspid valve allows blood flow from the right atrium to the right ventricle in one direction and prevents the backflow during systole. The leaflets of your tricuspid valve do not close completely, part of the blood flows backward from right ventricle into the right atrium and this is so called tricuspid regurgitation. To compensate the regurgitation, the right ventricle must then beat harder to maintain blood flow throughout the body, which will overload heart muscle, causing enlargement and heart failure. In the long run, this additional burden may cause congestive heart failure. The heart fails to supply sufficient blood to whole body to maintain normal function functioning. Therefore, you may experience shortness of breath, fatigue, irregular heart rate, or swelling in belly area, legs or neck veins.

Importance of Procedure

Transcatheter Tricuspid Valve Repair Procedure is a new treatment method by implanting a valve clipping device to repair the incomplete closure of tricuspid valve and improve your symptoms.

Pre-Procedure Preparation

- The doctor will review your medical record, history and current medications to confirm you are suitable for this procedure.
- Echocardiogram (TTE) and Trans-oesophageal echocardiogram (TEE) will be performed to assess and confirm the severity of your tricuspid regurgitation, to see whether you are feasible for this procedure.
- In addition, clinical staffs will conduct electrocardiogram, chest X-ray, blood tests, if needed CT scan or coronary angiography before the procedure, to confirm your suitability to undergo the procedure.
- Our medical staffs will explain to you and your relatives the benefits and details of the procedure, together with the possible risks and complications. You will have to sign a consent form.
- Before the procedure, your doctor may prescribe anti-platelet medication for you to prevent blood clot formation. You will be given antibiotic to decrease your chance of developing infection on date of procedure.
- If necessary, Anti-coagulant or Metformin (for diabetes) may have to be stopped several days before the procedure. Fasting of 8-12 hours is required prior to the procedure. An intravenous drip may be set up. Shaving may be required over the puncture sites.

- 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

- The implantation of a valve clipping device will be performed by cardiologists (and in some occasions, together with cardiothoracic surgeons) experienced in intervention for structural heart diseases to repair the incomplete closure of tricuspid valve. This procedure will be performed in a well-equipped cardiac catheterization laboratory or hybrid operation theatre guided by fluoroscopy.
- This procedure is performed under sterile conditions with general anaesthesia or controlled sedation (with Propofol) monitored by an anesthetist.
- Electrodes will be adhered on 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 procedure.
- The delivery catheter is introduced into the femoral vein and threaded up through the vessels into the heart. Vessels in both left and right femoral sites may be used.
- Your doctor will perform TEE during the procedure. This test uses sound waves to take a closer look at the inside structures of the heart. To perform the test, you will swallow a thin flexible tube with a special tip. This tube sits in the esophagus (the tube that connects the mouth to the stomach). The special tip of the tube sends out sound waves (ultrasound) that echo within the chest wall. The esophagus is located behind the heart so these echoes are picked up and create a picture of the heart that is displayed on a video monitor. The pictures will allow your doctor to take a closer look at your valve. Sometimes intracardiac echocardiography (ICE) may be used.
- After your doctor has assessed and confirmed the condition of your valve, the clipping device will be implanted to repair the incomplete closure of tricuspid valve, thus to reduce tricuspid regurgitation. If necessary, more than one clipping device will be used.
- During the procedure, your heart will be monitored by electrocardiogram. Fluoroscopy will be performed by your doctor to confirm the valve clipping device is under normal operation.
- The femoral venous puncture site may be closed by designed vascular closure devices after the procedure if needed.
- After device implantation, patients would be prescribed with anti-platelet or anti-coagulation medications based on individual risk profile. Echocardiography would be performed regularly after the procedure to assess position of the clip and condition of tricuspid regurgitation.

Post-Procedure Care

- After the procedure, catheters will be removed. The wound site may be compressed to stop bleeding.
- Nursing staff will check your blood pressure, pulse and wound regularly.

- Bed rest may be necessary for at least 4 hours. In particular, please do not move or bend the affected limb. Whenever you cough or sneeze, please apply pressure on the wound with your hand.
- You should inform your nurse if you have any discomfort in particularly chest discomfort or find blood oozing from the wound site.
- Please follow instruction for the use of medications.

Post-Procedure Follow Up

- Usually, you can be discharged 2-5 days 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, showers are allowed after 2 days.
- Please avoid vigorous activities (household or exercise) in the first 3 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.
- Please inform relevant clinical personnel about the presence of implanted valve clipping device in case you need to have other clinical / dental procedure later-on. You may need to have antibiotics before these procedures.

Risks and Complications

- The procedure carries certain risks.
- There is a small risk about 0.5-1% of respiratory depression, low blood pressure or heart rate associated with general anaesthesia or Propofol use. The sedative process will be closed monitored by an anaesthetist to ensure safety.
- There is a small risk regarding TEE (less than 0.5% esophageal rupture or aspiration) but the test would be necessary in most patients to have clear look of tricuspid valve, to guide the operation and to monitor development of any severe complications.
- Other than these, the procedure is associated with considerable morbidities: overall major complication rate (~5%), vascular complications (1%), risk of bleeding requiring blood transfusions (9.7-13 %), valve clipping device migration (7.7 %), causing embolism (0.04%), acute renal complications (1-4.2 %), hemorrhagic or ischemic stroke (1-1.3%), myocardial infarction (0.4-2.6%) or required emergency open-heart surgery (0.8-2%) and mortality (0.1-1%) (about 4.2% death rate at 6 month). But the procedure may still be worthwhile.
- 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 note that the procedure may need to be staged or re-do for various reasons. Separate charging is required for each procedure.

Remarks

- The list of complications is not exhaustive and other unforeseen complications may occasionally occur. The risk quoted is in general terms.
- 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

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