

Transcatheter Leadless Pacemaker (TLP)

Introduction

Heart rhythm is mainly controlled by the conduction system of the heart. Any abnormality in the conduction system may result in abnormal heart rhythm (arrhythmia). Arrhythmias with slow heart rate cause dizziness, syncope, heart failure or occasionally cardiac death.

Conventional transvenous pacemaker is one of the effective long-term treatments for patients with slow heart rate. It consists of a battery-powered generator and leads which connect the generator to patient's heart. The generator will be connected with the lead(s) and implanted in a pocket created under the skin or muscle.

Transcatheter Leadless Pacemaker (TLP) is another treatment option. It is a miniaturized and leadless pacemaker, in which the pacemaker is inserted through a catheter and implanted directly in the right atrium and/or ventricle. Compared with conventional transvenous pacemaker, TLP does not require pocket creation and associated wound complications, and risks of pneumothorax can also be eliminated. Besides, there are no restrictions on arm movement or weight-bearing activities. Patient can get back to work earlier, normal lifestyle can be maintained.

Importance of Procedure

TLP provides another effective long-term treatment option for patients with slow heart rate. If left untreated, patients can develop syncope, heart failure, or occasionally cardiac death. If you refuse this procedure, the result may be detrimental. Alternative treatments include implantation of conventional transvenous pacemaker and conservative management.

Pre-Procedure Preparation

- You need to sign an informed consent after explanation by your doctor.
- You will be invited to a ward or a clinic for some preliminary tests including electrocardiogram, chest X-ray and blood tests.
- Blood thinning drugs or metformin (for diabetes) may have to be stopped several days before the procedure. Steroid may be given if you have history of allergy.
- An IV infusion may be set up and you need to fast for 4 to 6 hours.
- Shaving near the implant site may be required.
- 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 invasive procedure is performed under local anesthesia in a cardiac catheterization centre or an X-ray room. You are alert during the procedure, but we may give you sedation to calm you down if necessary.
- 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.
- The delivery catheter is introduced into heart through the femoral vein. Vessels in both left and right femoral sites may be used.
- The procedure usually takes around 1 to 2 hours.

Post-Procedure Care

- After the procedure, catheters will be removed. The wound sites will be closed and 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 to 6 hours. In particular, please do not move or bend the affected limb to avoid bleeding. Whenever you cough or sneeze, please apply pressure on the wound with your hand.
- You should inform clinical staff if any oozing is detected from puncture sites.
- You may resume oral diet if no contraindicated.
- Please take more fluid to eliminate contrast by passing urine.
- Pre-discharge pacemaker programming have to be performed.

Post-Procedure Follow Up

- Usually, you can be discharged in 1 – 2 days after the procedure.
- Before discharge, the puncture site will be inspected and covered with light dressing. Please keep the wound site clean and change dressing if wet. In general, showers are allowed on the third day after procedure.
- You will be arranged to attend pacemaker clinic for regular pacemaker analysis, re-programming and battery power assessment.
- Please carry your pacemaker identity card at all times.
- Follow your doctor's instructions or refer to the information booklet from the pacemaker company to minimize the risk of pacemaker malfunction due to electromagnetic interference. In general, strong electro-magnetic field or radiofrequency signal will interfere your pacemaker, please keep a distance of at least 15 cm (6 inches) away from an active mobile phone. Household electrical or electronic appliance usually does not affect pacemaker.
- A new leadless pacemaker will need to be implanted or attempt to retrieve the old leadless pacemaker and implant a new unit in 6 to 10 years' time when the battery is depleted.

Risks and Complications

- The procedure carries certain risks.
- Major complications include mortality (rare), pericardial effusion/cardiac perforation (1-2%), and embolism /deep vein thrombosis (0.3%).
- Special risks related to the device include pacemaker syndrome (0.2%), device dislodgement (rare), and device /battery dysfunction (rare).
- Intravenous contrast allergy and impairment of renal function (rare).
- Special risks related to site access include infection, bleeding, and arteriovenous fistula (0.7%).
- 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 device which is 'Privately Purchased Medical Item'. Patients have to pay by themselves.
- Please note that there may have chance to re-do the procedure, either planned or unplanned for various reasons. Separate charging is required for each procedure.

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, 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.
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