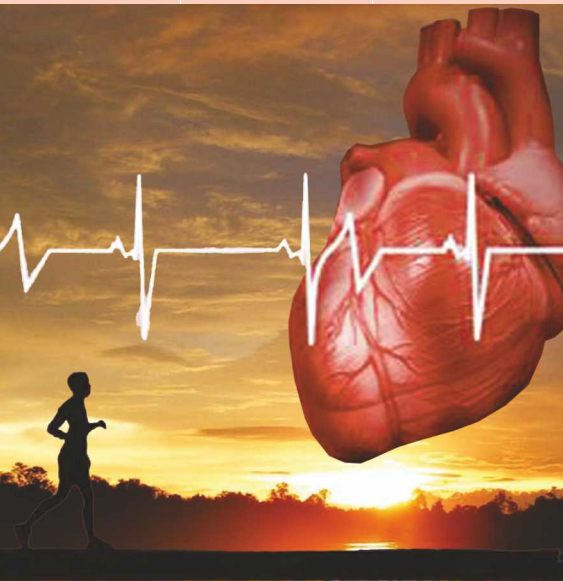


Exploring Electrophysiology of the Heart

(EP Study + Ablation)



P. D. HINDUJA HOSPITAL
& MEDICAL RESEARCH CENTRE

Electrophysiology

Cardiac electrophysiology is a medical speciality devoted to the diagnosis and treatment of abnormal heart rhythms. Electrophysiologists are fully trained cardiologists who have undertaken additional fellowship training in clinical cardiac electrophysiology. Cardiac electrophysiologists have expertise in the invasive diagnosis and treatment of cardiac arrhythmias (abnormal heart rhythms). They perform invasive procedures including diagnostic electrophysiology testing, radiofrequency catheter ablation, and implantation of antiarrhythmic devices such as pacemakers and defibrillators.

What is an EP study?

An electrophysiology (EP) study is a specialized procedure conducted by a highly trained Cardiologist who has gained special expertise. In this procedure, 3 thin flexible wires/catheters are inserted into your veins or arteries from the groin. These catheters are placed in different chambers and locations within your heart to record the electrical activity. With the help of the catheter, the electrical system of your heart is studied and problems diagnosed. These problems may be caused either due to an abnormal extra connection/circuit or abnormal focus. The conduction of the electrical impulses traveling in your heart is studied and extra abnormal circuits detected and located.

The sources of abnormal extra heart beats or abnormal connections are then burnt off/ blocked by delivering radiofrequency (RF) energy with the help of a fine catheter. This is called Ablation. The procedures usually last 2-3 hours and have been performed safely for many years. Complications are very rare.

What will be done once I get admitted?

Patient will be admitted one day prior or early morning on the day of the procedure. Current medications and symptoms (if any) will be examined by one of the nurses and the doctors.



What preparation do I need before the EP procedure?

Our doctor will explain the detailed procedure of EP Study in advance. He will also inform whether to stop taking any of your medications.

Before the procedure

- A written consent, will be taken from you after explaining the procedure, its details and risk (if any).
- 6 hours fasting is required before the procedure starts.
- The catheters are positioned from the groin and sometimes from the neck. These areas will be

cleaned and shaved.

- An intravenous cannula will be inserted in one of your hands/arms before the start of the procedure.
- Inform the doctor if you have any allergies or reactions to any drugs.

Where are these procedures performed?

The procedure will be performed in the DSA Lab, 1st Floor, ParamAnand Tower. It has a moveable procedure table on which the patient lies down and an X-ray machine is suspended over the table. This X-ray machine guides the doctor in placing the catheters within your heart. In addition, there is a large number of special electronic and computer equipment in the laboratory that is used during the electrophysiology (EP) study. These are EP equipment which transmits electrical signals from the heart onto the monitor, so that the doctor can analyze them.

The EP procedure

You will lie on the procedure table. The electrocardiogram (ECG) leads will be connected on your chest to record your ECG during the procedure. The nurses will thoroughly cleanse the groin region and/or right neck region with special soap. The procedure is done under local anesthesia with intravenous sedation, that will make you feel sleepy and relaxed. This will relieve you of your anxiety before the procedure and let you drift to sleep.

Following this, the doctor will inject local anesthesia into your groin at the site where the catheters will be inserted. After the local anesthesia has taken effect, the doctor will introduce 3-4 small tubes (2-2.5 mm wide) into your groin. In some patients, he may opt to put a small tube in the neck on the right side. At all times during the procedure your heart rate, blood pressure, respiration, blood oxygen level, and ECG will be continuously monitored by the nurses and doctors.

When the procedure starts, 2-4 temporary electrode catheters / wires (see fig. 1) are inserted into multiple heart chambers. The

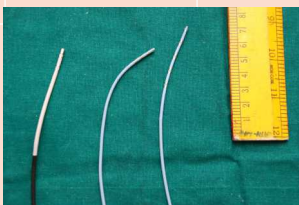


figure 1

The catheters or wires are inserted through the small tubes and positioned in the heart. One does not feel the movement of the catheters when they are moved up to the heart. The catheters are about 50 inches long and 2 mm wide and the electrodes are located near the tip. For some cases, a wire may also be inserted in a vein in the right neck region. The wires are positioned in different locations (see fig. 2&3) in the heart by advancing them through the veins under

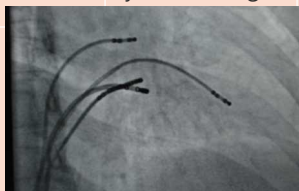


figure 2 - RAO

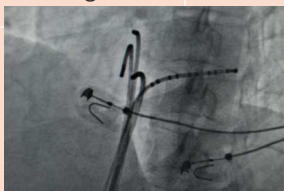


figure 3 - LAO

X-ray guidance. Most of them are placed in the upper chamber (atria), the lower chamber (ventricle) and an area called the His bundle and into the coronary sinus vein (which lies behind the heart). The wires permit electrical stimulation of the heart and recording of electrical activity. The patterns of the electrical conduction through the heart are displayed on a computer monitor. After the completion of the procedure all the catheters are removed.

After insertion of the wires, the diagnostic portion of the electrophysiology study will begin. This involves electrical stimulation of the heart and recording of electrical signals. This may cause the patient to feel their heart beating fast. The physicians analyze these electrical signals to determine the type of tachycardia (fast heart rate), the patient has and the location of the abnormal circuit. The patient should not feel alarmed if they feel their heart beating fast or irregularly during the procedure because this is a normal part of the study.

Radiofrequency (RF) Ablation

Ablation is the burning of the abnormal circuit or focus by delivering a very controlled burn with the radiofrequency energy. Ablation is performed to eliminate the tachycardia/ arrhythmia by getting rid of the abnormal circuit or focus. Not all tachycardias can be ablated. The cure rate for some tachycardias ranges from 90 to 98% while for some other types of tachycardias, it may be lower.

Procedure Time

The entire procedure (diagnostic and therapeutic portions) generally takes 1-3 hours; however, in very rare cases when the abnormal circuit/focus is difficult to find or reach with the ablation catheter, it may take longer, sometimes 5 hours. During the procedure the patient remains sedated and critical vital signs are continuously monitored. At the end of the procedure all the catheters and monitoring equipment are removed and the patient is taken to a regular hospital room where monitoring of vital signs and heart rhythm is continued.

What care should I take after the procedure?

After an ablation procedure the patient must lie in bed for 4-6 hours with the right leg remaining straight to avoid any bleeding from the groin. After that the patient can begin moving about, and generally is ready to go home that same day assuming no complications. When an ablation procedure is completed late in the day, the patient is kept overnight and discharged home the following morning.

What are the Benefits and Risks of Electrophysiology Procedures?

Patients need to weigh the small risks of the procedure against the potential benefits with the guidance of their doctor. The risks of the ablation procedure are very small, although it is not a risk-free procedure. The most serious reported

complications in medical literature includes death, stroke, heart attack, cardiac perforation requiring emergency surgery, heart valve damage, artery damage, blood clots, bleeding, or infection are rare. Some patients have a risk of complete heart block (electrical block) requiring implantation of a permanent pacemaker, although, the risk is still very low. Lot of care is taken during the procedure and these procedures are now extremely safe, if carried out by experienced personnel.

For further information or queries contact
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