

THE KNOW HOW OF CARDIAC ELECTROPHYSIOLOGICAL STUDY

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The History

Many patients do not have a strong idea as to why they are having an Electrophysiological (EP) study done. Some patients may say “I have WPW”. Most of the time, however, the patient will not present with such specific information.

“Why are you having this test?” / What type of symptoms have you been having” – Many patients who come to the catheterization lab are not certain of exactly what is going on, but most of them can tell you very clearly what type of problems they have been having. The patients may complain of “palpitations, dizziness, light headedness, racing heart rate, nervousness, thumping in my chest, almost fainted and feeling weak or tired”.

“How often this happen?” – Someone who has one or two episodes every few months or more is probably an SVT patient.

“Have you ever passed out from this?” – For suspected SVT, syncope or near syncope may indicate that the arrhythmia may conduct very fast.

“How old were you when this first happened?” – Patient in their teens or early twenties points towards bypass tracts (e.g. WPW).

“How long these episodes last?” – Generally speaking ventricular arrhythmias are of shorter duration. SVT due to bypass tracts is often faster than Atrio – ventricular nodal reentry (AVNRT) and is not tolerated well.

Inside Cath lab

The patient is brought in fasting non sedated state into the Cath lab. As Sedation may make it difficult to reproduce the patient’s arrhythmia, so it is given only when the physician specifically requests it. It should be noted that there will be patients that come into lab in an extreme state of anxiety. They may be afraid almost to the point of panicking. So intensive pre procedural counseling is required and confidence building measures should be taken. They should be reassured and be told that they would be fully awake during the procedure and it can take hours and they have to remain calm. They should also be informed that during the procedure, generation of arrhythmia is inevitable and is extremely important during the study. It can occur inadvertently during catheter manipulation and also during programmed stimulation and may cause sudden thumping of the chest.

Once the patient is on the table, they will be hooked up to twelve lead surface ECG. An electrode back patch is placed behind the back of the patient. The patient's right, left groin and right neck are cleansed with antiseptic solution and draped. Local anaesthesia (Lignocaine) is infiltrated in an around the above mentioned areas prior to the catheter insertion. Vascular sheaths are inserted as done during coronary angiogram. About five electrophysiology catheters are inserted via the venous (and sometimes the arterial system). The catheters defer from the coronary catheters as they are not hollow. The ablation catheter is slightly larger than the rest. The basic positions of the catheters inside heart are; Right atrium, His bundle region, Right ventricular apex and Coronary sinus. The catheters have multiple poles (Temporary pacing leads have two). Commonly used are quadripolar catheters (four poles) and for coronary sinus, decapolar (10 poles) are used. The catheters are connected via interphase cables to one or more (commonly two) junction boxes which serve as a junction point between the catheters and the EP machine. The EP machine consists of three parts; namely: Stimulator, Ablator and a Computer.

During the entire procedure the patient will have to lie still on the cath lab table. The electrophysiologist will be doing his part. He will measure various intracardiac intervals, induce and terminate arrhythmias. Study the mechanism and onset of arrhythmias generated. Finally localize the bypass tract or slow pathway of AV node using both surface ECGs, intracardiac ECG signals and multiple fluoroscopic views and ablate using radiofrequency waves. The entire procedure is almost painless and carries less of a risk when compared to Percutaneous Coronary Interventions. During application of radiofrequency burn some patient may feel slight pain.

Cardiac electrophysiological study and radiofrequency ablation is one of the most rewarding procedures in the Field of Interventional cardiology with success rates close to 100% in most forms of Supraventricular Tachycardias.