Treatments

Finding the cause of the rhythm problem provides the basis for selecting the best treatment plan. Generally, the effective and least invasive treatment is chosen.

Treatment for heart rhythm disorders falls into the following categories:

Lifestyle changes- as arrhythmia can be a part of heart diseases like heart attacks, lifestyle modifications play a big role to prevent such arrhythmia. Also,in arrhythmia which occurs on exertion and those associated with genetic diseases, avoiding exertion and lifestyle changes are paramount. Preventing prolonged standing and taking adequate water can be helpful in preventing the commonest type of fainting.

Medications- preventing heart attack by treatment of diabetes, hypertension, blood lipids can prevent arrhythmias that occur as a sequel to heart attack. Medications play an important role in preventing and treating supraventricular and ventricular arrhythmias. Atrial fibrillation can be prevented by effective medications. Also, medications are important to prevent clot formation in the heart as a result of a AF.

Therapeutic procedures-

a) Cardioversion- Where a controlled shock is given to convert an arrhythmia. This is done under sedation and often used as an emergency procedure for a dangerous arrhythmia. Also, it can be used to convert AF to control symptoms.
b) Catheter Ablation

Catheter Ablation

What Is Catheter Ablation?

Catheter ablation is a procedure where multiple flexible, thin catheters are positioned inside the heart in the area of heart tissue which creates or the reason behind the tachyarrhythmia. Once identified radiofrequency energy is delivered through this catheters and tissue is destroyed, thereby curing the patient from the arrhythmia. Catheter ablation alone does not always restore a normal heart rate and rhythm. You may need other treatments as well. Also, some people who have the procedure may need to have it done again. This can happen if the first procedure does not fully correct the problem.

Who will need the ablation?

Cardiac ablation may be an option in any of these cases:

1. If the arrhythmia cannot be controlled with lifestyle changes or medication.
2. If the patient cannot tolerate or don’t want to take the drugs used to treat the arrhythmia.

3. Patients with supraventricular tachycardia (SVT) — a rapid heartbeat that begins in the upper chambers of the heart and ablation carries high success rate with minimum risk
4. In patients with ventricular tachycardia (VT), an arrhythmia that begins in the lower chambers, ablation can done in patients with ICD (a shocking device which is positioned inside the patient's body to treat patient from sudden cardiac death),who have repeated ICD shocks.

Before Catheter Ablation

Before the catheter ablation, the patient will be fully evaluated for any coexisting conditions, with full review of patient's medical history and patient has to undergo some preprocedural investigations as a part of routine evaluation. Some drugs may interfere with the procedures that should be stopped at least 4-5 days, before the procedure as instructed by the doctor. If you are pregnant or you are not sure, you must inform your doctor before having catheter ablation as this procedure involves radiation, which can harm the foetus. Once the procedure is planned, the doctor will instruct you regarding, how long you should fasting and what you should have before the procedure etc.Usually you will need one day stay for simple ablations and more than a day for complicated procedure. This will be decided by your doctor after assessing you and your problem.

During Catheter Ablation

This procedure is performed in the hospital which has an electrophysiology unit. This procedure is performed by the doctors who are trained in this field of cardiac electrophysiology. The procedure involves inserting catheters — narrow, flexible tubes — into a blood vessel, often through a site in the groin or neck, and threading them through the vein until they reach the heart. The patient will be given drugs to make the patient sleep and drugs to alleviate the pain. A topical anaesthetic will be given to make the skin numb before the catheters are inserted. Using electrodes on the tip of the catheters, the doctor first conducts a study to pinpoint the location of the short-circuit causing the tachyarrhythmia. Once the precise location is confirmed, the "short-circuit" is destroyed to prevent it from sending faulty signals to the rest of the heart. This is done by sending energy through the catheters to destroy a small amount of tissue at the site. The energy may be either hot (radiofrequency energy), which cauterizes the tissue, or extremely cold, which freezes or "cryoablates" it. Most people may experience only brief moments of discomfort, rather than pain, during the procedure. Patient will need to lie still for four to six hours afterward to make sure that catheter incision site heals properly. Some patients may feel burning sensation when the doctor injects medicine into the area where he or she will insert the catheter and discomfort or burning in your chest when the doctor applies the energy. The patient may feel a faster heartbeat when the doctor stimulates the heart to find out where abnormal heartbeats are starting. The procedure lasts for 2-6 hrs depending on the case. Cardiac catheter ablation is an effective treatment for many types of arrhythmias. It is successful in 90 to 98 percent of cases, eliminating the need for open-heart surgery or long-term drug therapy.

Catheter ablation using advanced 3Dmapping systems:

Previously catheter ablation was done using X Ray imaging to locate the different chambers of the heart and recording the electrical signals from there. This is adequate while dealing with

arrhythmias like most supraventricular tachycardias, while the accurate localisation of culprit tissue is important in dealing with complex arrhythmias like atrial fibrillation and ventricular tachycardia. Now we have 3D mapping systems- two types, one using electrical impedance changes and another utilising magnetic field- locates accurately the tissue responsible and guides our ablation catheter accurately to destroy it. These mapping systems are more and more used in ablations in patient with structurally abnormal and damaged hearts.

After catheter ablation

Immediately after the procedure, the catheters will be removed, and pressure will be applied to the insertion site to minimize or prevent bleeding; a bandage may be applied. It is important to remain still during this time and to not move or bend the leg. Generally, the patient will stay in bed for some hours or overnight after the procedure for observation and go home the next day. Once you can get up and move around, you may feel stiff from lying still for so long. Most people can return to their normal routine within a few days. It is common to have a small bruise or lump (about the size of a walnut) at the site of catheter insertion, but you should contact your doctor immediately if the spot becomes warm, tender, or painful, or if it swells. You should also contact your doctor immediately if you experience fever, dizziness, or any other symptoms. Be certain to carefully follow your doctor's instructions regarding any medications and follow-up appointments.

On discharge:

Before going home, you will be instructed about: the medicines you have to take, the amount of rest you need, lifestyle modification and about the follow-up.

Radiofrequency ablation complications

Like any invasive procedure, radiofrequency ablation carries some risk. However, the risk of these complications is small in most cases. Possible complications include:

1. Problems related to threading the catheters through the blood vessels such as bleeding, infection, blood clots, bruising, and injury to the vessel(s)
2. Injury to the heart as a result of the catheters; this includes a perforation through the muscle or damage to one of the valves within the heart
3. Blood clots that travel to the lungs (pulmonary embolism) or brain (stroke)
4. Heart block, or failure of any electrical impulse to travel from the top parts of the heart to the bottom. This complication, if permanent, requires implantation of a pacemaker.
5. New arrhythmias
6. Exposure to radiation during the procedure, which can take several hours. This can produce a very small increase in the risk of cancer or genetic defects.
7. As with any procedure involving the heart, complications sometimes can be fatal. However, this is rare with catheter ablation.

Electronic Devices:

(a) Implanted cardioverter defibrillators (ICDs) – ICDs continuously monitor the heart rhythm, automatically function as pacemakers for heart rates that are too slow and deliver life-saving shocks if a dangerously fast heart rhythm is detected. These devices are 99 percent effective in stopping life-threatening abnormal heart rhythms and are the most successful option to treat ventricular fibrillation (VF), the major cause of sudden cardiac arrest (SCA).
(b) Pacemakers – Devices that "pace" the heart rate when it is too slow (bradycardia) can take over for the heart's natural pacemaker, the sinoatrial node, when it is not working properly. Pacemakers monitor and regulate the rhythm of the heart and send electrical signals to stimulate the heart if it is beating too slowly. Pacemakers are implanted when there are symptoms of dizziness and fainting due to slow heart rate or temporary stoppage of the heart. They consist of a pulse generator (Battery and electronic circuits) implanted most commonly in the left upper chest wall and leads (wires) are connected to it to deliver the electrical impulses to the heart muscle to make it beat.The implantation is a short surgical procedure under local anaesthesia.
(c) Devices for Heart Failure – A cardiac resynchronization therapy (CRT) device is a special type of pacemaker for certain patients with heart failure. The implanted device paces both the left and right ventricles (lower chambers) of the heart at the same time. This helps to resynchronize muscle contractions and improve the efficiency of the weakened heart.

Newer types of pacemakers:

His bindle and left bundle pacing: Traditionally pacemakers carry the electrical impulse to Right ventricular muscle near the tip of the ventricle and also to the right atrium in order to make the atrium and ventricle beat in unison. Now, there is a technique and tools by which the RV lead or wire can be implanted to electrically stimulate the normal electrical circuit of the heart rather than the RV muscle. This is called His bundle or left bundle pacing. It mimics the normal electrical conduction of the heart and results in better heart muscle function on long run.

Leadless pacemakers:

This is also a new development where the pacemaker (battery and circuits) are placed directly in right ventricle without need of wires or leads. This prevents a surgical procedure and also prevents problems with the leads on long run. As of now, it can only be used for those who does not require atrial pacing (like patients with atrial fibrillation and very slow ventricular rate of heart block).