



CATHETER ABLATION for SUPRAVENTRICULAR TACHYCARDIA

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What is Supraventricular Tachycardia?

Supraventricular tachycardia (SVT) is a very common type of heart racing affecting up to 1 in 400 people in the population. The heart racing is due to an abnormal electrical circuit travelling very rapidly around and around in your heart at between 150-250 beats per minute. These circuits generally travel between the normal tissue conducting "wire" or pathway in your heart and one or more abnormal tissue fibres (similar to an electrical short circuit).

Generally individuals with this type of heart racing, or tachycardia, have been born with these extra tissue fibres (or pathways) even though the racing may not become evident until the teen years or even later. Several different types of these pathways exist and the electrocardiogram (ECG) obtained at a time when your heart is racing, as well as the ECG obtained at normal times, may give us hints as to the type of abnormal electrical pathway(s) you have.

Interestingly, most individuals who have these abnormal electrical pathways within their hearts have otherwise normal hearts. This is fortunate since curing this "electrical" problem results in normal heart function.

The most common types of abnormal electrical pathways leading to these electrical circuits and tachycardia include:

1. **Wolff-Parkinson-White syndrome.** An extra pathway of tissue fibres bridges the upper (the atria) and the lower chambers of the heart (the ventricles), either on the left side or the right side of the heart.

2. **AV node re-entry.** An extra pathway may exist in close proximity to your normal conducting "wire" (the atrio-ventricular node) such that an electrical circuit may race around between the normal "wire" and the extra fibre.

Why Catheter Ablation?

Catheter ablation for both **WPW** and **AV node re-entry** tachycardia is being used now as the treatment of choice in individuals with frequent arrhythmias, particularly for those in whom either drugs don't work or are poorly tolerated.

The advent of catheter ablation as treatment for arrhythmias is of importance for two reasons:

- First, the procedure has a very high **cure** rate (approximately 95%) with a low risk of complications.
- Second, many individuals with supraventricular tachycardia require "lifelong" anti-arrhythmic drug therapy to control the arrhythmias.

It is not clear to us whether long-term use of medications to treat these arrhythmias is safe. Most of the drugs used have been proven safe and effective but our experience has generally been in an older population of patients with severe heart problems such as heart attacks, angina and heart failure.



Catheter Ablation

In order to cure the arrhythmias special **catheters** (small, flexible wires with metal tips) have been designed which allow us to temporarily position these in the heart and locate the abnormal tissue responsible for the rhythm abnormality. If the abnormal heart tissue can be destroyed the arrhythmia is generally cured. The form of energy

which is delivered from the tip of the catheter destroying a tiny surrounding region of heart tissue (the area destroyed by the ablation is approximately the size of a kernel of corn), is **called radiofrequency energy**. Radiofrequency energy delivered from the tip of the catheter is similar to that used by surgeons with their electronic scalpel (cautery). Therefore the technique is called **radiofrequency catheter ablation**.

Ablation Procedure

You will be taken to the Electrophysiology laboratory (EP Lab). Generally patients are admitted to the hospital the morning of the procedure.

All medications for your heart rhythm must be stopped 4 days prior to the procedure.

Since x-ray is required for the procedure you must alert your physician if you think you may be pregnant.

In the EP Lab you will be sedated and kept comfortable. In some individuals, if markedly anxious, a general anesthetic is used. Generally though, light sedation with local anesthesia is more than sufficient, (i.e., you will be awake but sleepy). Local anesthetic is placed in the skin using a small needle in the right groin. Other than a slight sting from the freezing needle (similar to the freezing you may have received at the dentist's office) there is very little discomfort. After the local anesthetic has taken effect, intravenous sheaths are placed in the large vein in the groin at the top of the leg (occasionally a sheath will be placed in the adjacent artery on the leg and rarely in the vein just below the collar bone). Through these sheaths, using x-ray guidance, the flexible EP catheters are advanced up the vein to the heart. There is very little sensation associated with the placement of these catheters.

The ablation catheter is moved to look for electrical signals that tell us we are close to your abnormal fibre. Radiofrequency energy will be delivered through the catheter and into the heart muscle surrounding the abnormal fibre. Occasionally multiple applications of electrical current may be required to destroy the abnormal fibre.

At the end of the procedure all of the catheters and sheaths will be removed. You will stay in bed for 3 to 5 hours to prevent bleeding at sites where the catheters were inserted in your groin. An echocardiogram is sometimes done before you are discharged to ensure that your heart is functioning normally.

Discharge home usually is arranged later the same day (although you may be asked to stay in hospital overnight). You may be instructed to take aspirin 1 tablet a day for 2 months after the procedure.

The chances of successfully ablating the abnormal fibres and curing the tachycardia are over 90%. Afterwards, there is less than a 5% chance the fibre has been only "stunned" and may recover. If the abnormal fibre recovers, you and your physician may choose to perform a second ablation procedure.

Possible Risks

The following is a list of possible risks of an ablation procedure:

1. The application of the radiofrequency current close to the normal conduction system of the heart could produce heart block and necessitate implantation of a permanent pacemaker (1% risk). This risk only applies if the abnormal pathway is close to your normal electrical conduction system, (i.e., within a centimetre or less).
2. A blood clot may form on the catheter that carries the radiofrequency current of the heart at the site of the ablation. The clot may become dislodged and obstruct a blood vessel which might produce a stroke, heart attack or injure another organ (approx. 1:1000 risk).
3. A catheter could damage the heart valve, coronary artery, or cause a heart attack. The risk is very rare.
4. Other rare complications (reported in the literature) include: cardiac perforation, hemo or pneumothorax (blood or air in the chest wall requiring tube drainage), damage to the femoral artery (1:100) & damage to the phrenic nerve (the nerve supplying the diaphragm).