Atrial Flutter Ablation

Patient Information

The Heart

The heart is a pump responsible for maintaining blood supply to the body. It has four chambers. The two upper chambers (the right atrium and left atrium) are the chambers which receive blood as it returns from the body via the veins. The lower chambers (the right and left ventricle) are the chambers responsible for pumping the blood out to the body via the arteries. Like any pump, the heart has an electrical system that controls how it functions.

Normal heart rhythm.

In order for the heart to do its work (pumping blood throughout the body), it needs a sort of spark plug or electrical impulse to generate a heartbeat. Normally this electrical impulse begins in the upper right chamber of the heart (in the right atrium) in a place called the sino-atrial (SA) node. The SA node is the natural pacemaker of the heart. The SA node gives off electrical impulses to generate a heartbeat in the range of 60 to 100 times per minute. If you are exercising, doing strenuous work or you are under a lot of stress, your heart rate may be faster. When you rest or sleep your heart rate will slow down. If you take certain medications, your heart rate may be slower. All of this is appropriate.

From the SA node, the electrical impulse is relayed along the heart’s conduction system. It spreads throughout both the right and left atria causing them to contract evenly.

When the impulse spreads over the right atrium it reaches the atrio-ventricular (AV) node. This is a very important structure in the heart because it is the only electrical connection between the top chambers and the bottom chambers. It is therefore the only way in which an electrical impulse can reach the pumping chambers (the ventricles). The impulse spreads through the AV node and down into the lower chambers or ventricles of the heart. This causes them to contract and pump blood to the lungs and body.

How do abnormal heart rhythms occur?

In some hearts, an abnormal heart rhythm develops when an electrical impulse either starts from a different location, other than the SA node, or follows a route (or pathway) that is not normally present. This is what happens in atrial flutter. A short-circuit develops in the right atrium as show in the diagram below.

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"Typical flutter is an abnormal rhythm of the right atrium"

"It is a simple circuit that rotates around the right atrium at over 300 beats per minute"

The typical atrial flutter circuit is shown by the orange arrows.
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Atrial Flutter is due to a short circuit in one of the upper chambers of your heart termed the right atrium. This rapid short circuit has several consequences:

1. The short circuit drives the pumping chambers very rapidly and sometimes erratically. This produces palpitations, shortness of breath, and tiredness. In some people it can also cause dizziness and chest pain.
2. The short circuit results in ineffective pumping of the upper chambers. This leads to slow blood flow in both of these upper chambers (the left and right atrium). This can rarely cause blood clots and possibly stroke. One of the major reasons to cure atrial flutter is to prevent this risk of stroke.
What treatments are available for atrial flutter?

1. Atrial flutter can be treated with medication. In some people these medicines can be very effective. In others however, the medications are ineffective and may produce side effects. If you elect to take medication, your doctor will discuss the different options and the possible side effects of these medications.

2. DC Shock. When the heart is in flutter it can be reverted to the normal rhythm with a “shock on the chest”. You receive a short general anaesthetic and the shock reverts the rhythm to normal in almost all cases. With this approach the possibility of the flutter returning remains present (approximately 50% of patients will have another episode of atrial flutter over the next year). In addition, most patients will also require a medicine to try to prevent the flutter coming back.

3. Blood Thinning medication. Because of the risk that atrial flutter may return with the above treatments, most patients with atrial flutter will require blood thinning medication to prevent blood clots forming. At your doctors discretion this may either be with aspirin or warfarin.

4. Radiofrequency ablation. This procedure carries a success rate of approximately 95% for curing the atrial flutter. The risk of the flutter returning at some time in the future is approximately 10%.

Radiofrequency Ablation

What is involved in a radiofrequency ablation procedure?

You will be transferred to the Electrophysiology Laboratory (EP lab) from your ward. Usually before leaving your ward you will be given a light sedative and your groin will be shaved.
The EP lab has a patient table, X-Ray tube, ECG monitors and various equipment. The staff in the lab will all be dressed in hospital theatre clothes and during the procedure will be wearing hats and masks.

Many ECG monitoring electrodes will be attached to your chest area and patches to your chest and back. These patches may momentarily feel cool on your skin.

A nurse or doctor will insert an intravenous line usually into the back of your hand. This is needed as a reliable way to give you medications during the study without further injections. You will also be given further sedation if and as required. You will also have a blood-pressure cuff attached to your arm that will automatically inflate at various times throughout the procedure.

The procedure may be performed either under local anaesthetic with sedative medication to make you feel relaxed and comfortable or under general anaesthetic with you completely asleep. You will be able to discuss the approach with your doctor and the anaesthetist.

The oxygen level of your blood will also be measured during the procedure and a small plastic device will be fitted on your finger for this purpose. Your groin area and possibly your neck or arm will be washed with an antiseptic cleansing liquid and you will be covered with sterile sheets leaving these areas exposed.

The doctor will inject local anaesthetic to the area where the catheters are to be placed. After that, you may feel pressure as the doctor inserts the catheters but let the staff know if there is any discomfort so some more local anaesthetic can be given. Once the catheters are in place you may feel your heart speeding up. This is due to the electrical stimulation of the heart by the catheters. If your heart is in a normal rhythm at the time of the procedure, your doctor may possibly want to induce atrial flutter. This allows the doctor to determine the exact location of the flutter in order to allow its cure.

**What is radiofrequency ablation (RFA)?**

Radiofrequency is a low power, high frequency energy that causes a tiny region of the heart near the tip of the catheter to increase in temperature, thus ablating a small area of tissue.

Radiofrequency energy has been used for decades by surgeons to cut tissue or to stop bleeding. For the treatment of palpitations, a much lower power of radio-frequency is used.

The electrical catheters are usually inserted into the heart via a vein in the groin area. Occasionally a vein in the side of the neck is also used.

“**Atrial flutter can be treated with a simple ablation procedure.**”

“**An ablation catheter is passed up from a vein at the top of the leg to the right atrium. The ablation catheter is used to cauterise tissue (red dots) and create a line of scar tissue that forms a ‘road-block’ so that the flutter circuit cannot form.”**
The electrical catheters are positioned using X-Rays to guide the placement and also by using electrical recordings from inside the heart.

The short-circuit is then localised electrically and a small burn created at the weak-link in the short circuit.

The atrial flutter ablation procedure may take approximately 2-3 hours on average.

**What happens prior to your procedure?**

You will receive a letter from the hospital bookings clerk or from the Doctors secretary outlining the date of your procedure and date and time of your admission to the hospital.

In some cases a letter asking you to cease taking your medication is enclosed. This generally refers only to the medication you are taking for your abnormal heart rhythm. Your doctor will specify which medications he wants you to stop. These are usually stopped 5 days prior to your procedure. If you are taking anti-coagulation (blood thinning) medication eg warfarin then you will need to stop this for one week prior to your procedure. Your doctor may arrange for you to have daily heparin injections after you stop the warfarin.

Patients having the procedure at the Royal Melbourne Hospital will be required to attend our Pre-admission clinic on the day prior to your procedure.

Some country patients may need to make arrangements to stay overnight with family or friends.

At the pre-admission clinic you will see a doctor who will record your medical history. You will also require an ECG and blood test. The doctor will also confirm the time you should be at the hospital for admission the following day.

You will be required to fast for at least six hours before the study. If your procedure is in the afternoon you may have a light breakfast. If your procedure is in the morning,

**DO NOT EAT OR DRINK AFTER MIDNIGHT, except for sips of water to help you swallow your pills.**
What are the risks of an atrial flutter ablation procedure?
The Radiofrequency ablation procedure is a very low-risk procedure and should a complication arise, it will be dealt with at once. The worldwide complication rate for Electrophysiology studies and radiofrequency ablation procedures is less than 0.5%.

Although most people undergoing radiofrequency ablation procedures do not experience any complications, you should be aware of the following risks.

- **Local bleeding, blood clot or haematoma** (blood collection) - this may occur at the catheter insertion site.
- **Rapid abnormal heart rhythm** - this may actually cause you to pass out for a very short period of time and in some cases a small electric shock may be required to restore your normal rhythm.
- **Perforation or damage** - very slight chance that this may occur to either a heart chamber or to the wall of one of the arteries.
- **Heartblock** - depending on the location and type of your atrial flutter, there is a very small chance of damage occurring to the heart’s normal electrical system. This may be temporary, but permanent damage would result in a pacemaker being inserted at the time of the procedure.
- **Major complications** - stroke, heart attack, death are very rare.

What Special Precautions will be taken?
As discussed above, atrial flutter carries a very small risk of stroke due to the risk of blood clot formation in the left atrium. This is one of the reasons to cure the rhythm disturbance. This risk increases slightly at the time that the heart reverts from the atrial flutter to the normal rhythm. This increased risk is present whether the rhythm is reverted with medication, with a DC shock on the chest or with a radiofrequency ablation procedure. In order to prevent this occurring the following precautions will be taken:

I. At the time of the procedure you will have a special ultrasound study of your heart termed a transoesophageal echo. This involves passing a small probe into the oesophagus (the swallowing tube). This gives clear pictures of the heart and ensures that no blood clots are present. This study will be performed while you are asleep.

II. During the procedure you will be given blood thinning medication.

III. After the procedure you will be started back on blood thinning medication (warfarin) for 6 weeks. The warfarin may take approximately 1 week to reach the required levels and during this time you will also be receiving daily injections of heparin. These can usually be given by your local doctor.

Radio-frequency ablation is an effective and safe way to cure patients suffering from atrial flutter.

Please do not hesitate to discuss any aspect of the procedure including potential complications with your doctor prior to your procedure.

What to expect after your procedure.

- After your procedure you will be transferred back to your ward where you will have to lie flat for 4-6 hours. During this time, it is important to keep your legs straight and your head relaxed on the pillow.
- Most patients stay in hospital overnight and their heart rhythm may be monitored during this time.
- The majority of patients have approximately 1 week away from work.

Special note:- If there is any chance you may be pregnant, please notify your doctor before your procedure.

If there are any questions about your ablation procedure please contact Karen Halloran our Arrhythmia Nurse Consultant via The Department of Cardiology on 93427133