

Catheter Ablation for Atrial Fibrillation

Atrial fibrillation (or AF) is the most common electrical disorder of the heart. It causes the heart to beat fast and irregular. It can result in symptoms such as palpitations, shortness of breath and lethargy. It predisposes to stroke and, in some cases, may seriously affect the heart function.

The pulmonary veins, the veins which deliver blood back to the heart from the lungs, are also the source of electrical activity that triggers AF in vast majority of cases. AF ablation is a minimally invasive heart procedure using catheters introduced from the groin (or femoral) vein into the heart. These catheters are used to deliver either heating (called radiofrequency or RF) around the outside of the pulmonary veins, so that this tissue is no longer able to conduct electrical impulses from the pulmonary veins to the rest of the heart. The veins therefore become 'electrically isolated' from the rest of the heart, and the electrical activity which previously triggered AF, is no longer able to do so. There is considerable evidence that AF ablation is more effective than medications in eliminating or reducing the frequency of AF.

Why is it Done?

In some patients, medications (called anti-arrhythmic medication) can control symptoms of AF, however, in many patients, these medications are ineffective, poorly tolerated or long-term therapy is considered undesirable. For these patients, catheter ablation of AF is an effective treatment option. It can control or eliminate symptoms, and potentially avoid the need for long-term anti-arrhythmic medications. The decision to proceed with an AF ablation is a shared process between you and your doctor after a detailed discussion of the potential risks and expected benefits.

Risks

It is not uncommon to experience some minor bruising from the access site in the leg, and some mild irritation in the chest in the first few days following the procedure. This is anticipated.

Serious risks associated with AF ablation are rare. However, they are not zero and some can be serious. These can include:

1. Injury to the groin blood vessel (1:200-400)
2. Stroke or heart attack (1:400-800)
3. Cardiac tamponade (build-up of fluid/blood around the heart) (1:500-1000)
4. Injury to phrenic nerve (1:200)
5. Complication requiring emergency surgery (1:500-1000)
6. Atrio-oesophageal fistula (1:3000-4000) – developing abnormal connection between food pipe and heart.

The incidence of serious complications following AF ablation is low, but around 1-1.5%. For this reason, AF ablation is usually offered to those patients who have failed or are unable or unwilling to take anti-arrhythmic medication, rather than a first line treatment

How you Prepare

Almost all AF ablation are elective or scheduled in advance, giving you time to prepare. AF ablations are performed in the cardiac catheterization (cath) lab of a hospital. Your health care team will give you specific instructions and talk to you about any medications you take. General guidelines include:

- Medications to suppress arrhythmias (called anti-arrhythmic medications), may need to be stopped at least 5-7 days prior to the procedure. Your doctor will advise you if this is needed and exactly which medication(s) to stop and when.
- Don't eat or drink anything after midnight before your procedure.
- Take all your medications to the hospital with you in their original bottles. Ask your doctor about whether or not to take your usual morning medications.
- If you have diabetes, ask your doctor if you should take insulin or other oral medications before your procedure.
- Blood-thinning medication usually need to be continued. Your doctor will advise if these need to be withheld prior.

What you can expect?

Before the Procedure

Before your procedure starts, your health care team will review your medical history, including allergies and medications you take. You'll also empty your bladder and change into a hospital gown. You may have to remove contact lenses, eyeglasses, jewellery and hairpins.

During the Procedure

For the procedure, you lie flat on your back on an X-ray table. X-ray cameras may move over and around your head and chest during the procedure. AF ablation procedures usually require a general anaesthetic which an anaesthetist will administer. Whilst under anaesthesia, a special ultrasound probe is positioned in the food pipe (oesophagus) which provides high resolution, real-time images of the heart. This is important to make sure there are no blood clots in the heart, and to ensure the catheters are correctly guided to the left atrium.

Electrodes on your chest monitor your heart throughout the procedure. An EPS usually involves a number of additional stickers and patches placed on over the chest. A blood pressure cuff tracks your blood pressure and another device, a pulse oximeter, measures the amount of oxygen in your blood.

A small amount of hair may be shaved from your groin where a flexible tube (catheter) will be inserted, and on your chest where electrode sticker must attach. The area is washed and disinfected and then numbed with an injection of local anaesthetic.

A small incision is made at the entry site, and 3 to 4 short plastic tubes (sheath) are inserted into your groin vein under ultrasound guidance. Catheters is inserted through the sheath into your blood vessel and carefully threaded to your heart. These are used to perform the ablation. A specialised computer system allows us to create 3D real-time image of the heart chambers and the position of the catheters. This minimises the need for the use of X-rays.

This is used to guide the delivery of a highly focussed heat energy (called radiofrequency ablation or RFA) around the pulmonary veins. This creates an “electrical buffer zone” around the veins effectively electrically isolating from the rest of the heart chamber. Thus, the abnormal electrical signals from these veins can no longer trigger atrial fibrillation. Patients who have more advanced forms of AF (such as long-standing or persistent AF), may have areas outside of the pulmonary veins that may require additional ablation. Having an AF ablation takes between 2-3 hours (occasionally longer), including the time to administer and recover from the anaesthesia.

After the Procedure

When the EPS is over, the catheters and plastic tubes are removed from your arm or groin and the incision is closed with manual pressure or occasionally a temporary stitch or an air-cushion clamp.

You'll be taken to a recovery area for observation and monitoring. When your condition is stable, you return to your own room, where you're monitored regularly. You'll need to lie flat for a few hours to avoid bleeding. During this time, pressure may be applied to the incision to prevent bleeding and promote healing. You will have to remain in the hospital overnight. If you're feeling up to it, have something to eat.

Ask your health care team when to resume taking medications, bathing or showering, working, and doing other normal activities. Avoid strenuous activities and heavy lifting for several days. This is mostly to avoid bleeding from the vascular access site. It is important to continue you blood thinner (anticoagulation) medication for a minimum of 3 months after the procedure. This should not be stopped unless directed to do so by your specialist doctor. Your doctor will advise you if anticoagulation is needed in the long term after AF ablation.

Your puncture site is likely to remain tender for a while. It may be slightly bruised and have a small bump. It is not uncommon to feel palpitations within the first 3 months from the procedure. For this reason, antiarrhythmic medications may be continued for a period of time after the ablation (up to 3-6 months)

Call your doctor's office if:

- You notice bleeding, new bruising or swelling at the catheter site
- You develop increasing pain or discomfort at the catheter site
- Weakness or numbness in the leg or arm where the catheter was inserted
- You develop chest pain or shortness of breath
- You develop fever and/or swallowing difficulty
- Any other symptom of concern to you

- If you have recurrence of sustained palpitations

If the catheter site is actively bleeding and doesn't stop after you've applied pressure to the site, contact 000 or emergency medical services. If the catheter site suddenly begins to swell, contact 000 or emergency medical services.

Outcomes

The success rates of AF ablation vary depending on the type of AF that you have.

- Paroxysmal AF (the type that comes and goes by itself) has a success rate of around 70-90% (likelihood of being free of AF at 12 months).
- Persistent AF (the type that lasts for more than a week, or until cardioversion is performed) has a success rate of 50-80% (likelihood of being free of AF at 12 months).
- Most patients will be able to come off all anti-arrhythmic medications in the long term, or in some patients previously ineffective medications may become effective again in controlling AF after ablation.
- Some patients may require a repeat procedure to re-isolate the veins in the case of recurrence of AF.