

Catheter Ablation for Ventricular Tachycardia

Catheter ablation for ventricular tachycardia (or VT) is a procedure aimed at eliminating or significantly reducing arrhythmias arising from the large chambers of the heart (the ventricles). There are broadly speaking two broad categories of VT ablation:

1. VT ablation in the absence of known heart disease (ie hearts that are otherwise normal)
2. VT ablation in the setting of known heart disease (such as ischaemic heart disease or dilated cardiomyopathy)

Why is it done?

VT ablation is performed to eliminate or significantly reduce the burden of ventricular tachycardia, and additionally to reduce the reliance upon anti-arrhythmic medications to control the arrhythmia. In patients with known heart disease, VT can be life-threatening and cause cardiac arrest (a failure of heart pumping leading to collapse) or can cause repeated shocks from implantable cardiac defibrillators (ICDs) which can cause significant discomfort to patients. In patients without structural heart disease, VT often causes dramatic palpitations which may also be associated with dizziness or collapse. Rarely in these patients, VT can also be life-threatening or precipitate a cardiac arrest.

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 VT ablation are not common 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 (1:200-400)
3. Cardiac tamponade (build-up of fluid/blood around the heart) (1:200-500)
4. Complication requiring emergency surgery (1:500-1000)
5. Refractory cardiac arrest (1:500-1000)
6. Death – (1:500-1000)

The incidence of overall serious complications following VT ablation is low, but around 2-3%. For this reason, VT ablation is usually offered to those patients who have failed or unable to take anti-arrhythmic medication, rather than a first-line treatment.

How you prepare

Most VT ablations are elective or scheduled in advance, giving you time to prepare. Occasionally they are done in an emergency setting.

VT 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. VT 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. Additional access to the adjacent artery is also often required. Catheters are 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) in the ventricle. The aim of the procedure is to target areas within the scar that may form

electrical circuits that allow the VT to propagate. Additional ablation around sited thought critical to maintaining the VT is also performed.

Having an VT ablation takes between 2-4 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 your 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
- Any other symptom of concern to you
- If you have recurrence of sustained palpitations, or collapse
- If your implantable cardiac defibrillator delivers a shock

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 VT ablation vary depending on the type of VT that you have.

- For VT in the absence of known heart disease success rates vary between 50-90% depending on the location of the source of the VT.

- For VT in the setting of known heart disease, the success rates will vary depending on the severity of the heart disease, the underlying heart condition and the degree of heart failure.
- Some patients may require a repeat procedure in the setting of recurrent VT.