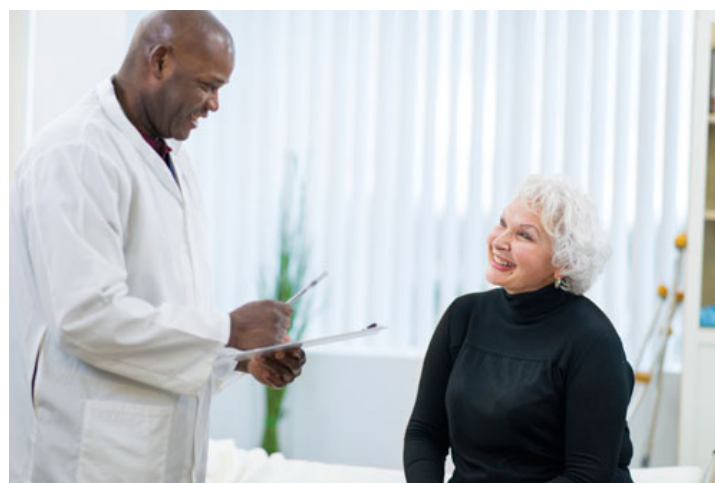




## Varicose Vein Treatment (Endovenous Ablation of Varicose Veins)

Varicose vein treatment, also known as endovenous ablation, uses radiofrequency or laser energy to cauterize and close varicose veins in the legs. It may be used for cosmetic purposes, but it is most commonly used to help ease varicose vein related symptoms such as aching, swelling, skin irritation, discoloration or inflammation. Endovenous ablation is safe, less invasive than conventional surgery, and leaves virtually no scars.



Tell your doctor about any recent illnesses, medical conditions, allergies and medications you're taking, including herbal supplements and aspirin. You may be advised to stop taking aspirin, nonsteroidal anti-inflammatory drugs (NSAIDs), or blood thinners several days prior to your procedure. Leave jewelry at home and wear loose, comfortable clothing. You may be asked to wear a gown. Plan to have someone drive you home afterward.

## What is Varicose Vein Treatment (Endovenous Ablation of Varicose Veins)?

Varicose veins are abnormally large veins commonly seen in the legs. Normally, blood circulates from the heart to the legs via arteries and back to the heart through veins. Veins contain one-way valves which allow blood to return from the legs against gravity. If the valves leak, blood pools in the veins, and they can become enlarged or varicose .

Endovenous ablation is an image-guided, minimally invasive treatment for varicose veins. It uses radiofrequency or laser energy to cauterize (burn) and close the abnormal veins leading to varicose veins.

## What are some common uses of the procedure?

Although this procedure may be used for cosmetic purposes, it is more commonly used to help ease symptoms related to varicose veins in the legs. Leg symptoms can include:

- aching or throbbing pain
- leg heaviness/fatigue
- swelling
- skin irritation or sores (ulcers)
- skin discoloration
- inflammation in the vein (phlebitis)

## How should I prepare?

You should report to your doctor all medications that you are taking, including herbal supplements, and if you have any allergies, especially to local anesthetic medications, general anesthesia or to contrast materials containing iodine (sometimes referred to as "dye" or "x-ray dye"). Your physician may advise you to stop taking aspirin, nonsteroidal anti-inflammatory drugs (NSAIDs) or blood thinners for a specified period of time before your procedure.

You should wear comfortable, loose-fitting clothing. You will need to remove all clothing and jewelry in the area to be examined.

You should plan to have a relative or friend drive you home after your procedure.

You may be asked to wear a gown during the procedure.

## What does the equipment look like?

In this procedure, an ultrasound machine, vascular catheter, radiofrequency electrode or laser fiber, and console are used.

Ultrasound scanners consist of a console containing a computer and electronics, a video display screen and a transducer that is used to do the scanning. The transducer is a small hand-held device that resembles a microphone, attached to the scanner by a cord. Some exams may use different transducers (with different capabilities) during a single exam. The transducer sends out high-frequency sound waves (that the human ear cannot hear) into the body and then listens for the returning echoes from the tissues in the body. The principles are similar to sonar used by boats and submarines.

The ultrasound image is immediately visible on a video display screen that looks like a computer or television monitor. The image is created based on the amplitude (loudness), frequency (pitch) and time it takes for the ultrasound signal to return from the area within the patient that is being examined to the transducer (the device placed on the patient's skin to send and receive the returning sound waves), as well as the type of body structure and composition of body tissue through which the sound travels. A small amount of gel is put on the skin to allow the sound waves to travel from the transducer to the examined area within the body and then back again. Ultrasound is an excellent modality for some areas of the body while other areas, especially air-filled lungs, are poorly suited for ultrasound.

A catheter is a long, thin plastic tube that is considerably smaller than a "pencil lead", or approximately 1/8 inch in diameter.

Laser fibers or radiofrequency electrodes carry laser or electrical energy from their respective power generators into the body.

## How does the procedure work?

Ultrasound is used to visualize the varicose vein. A laser fiber or radiofrequency electrode is advanced to the desired location within the vein through an IV. Local anesthesia is injected to collapse the vein around the laser and act as insulation for the heat of the radiofrequency or laser energy. Laser or radiofrequency energy is then applied, heating the vessel and causing it to close. Following the procedure, the faulty vein will shrink and "scar down."

## How is the procedure performed?

Image-guided, minimally invasive procedures such as endovenous ablation are performed by a specially trained interventional radiologist.

This procedure is often done on an outpatient basis. However, some patients may require admission following the procedure. Please consult with your physician as to whether or not you will be admitted.

Your physician may use a topical anesthetic cream over the abnormal vein area before the procedure in order to reduce discomfort.

The leg being treated will be cleaned, sterilized and covered with a surgical drape.

Your physician will numb the area where the catheter will enter into the abnormal vein with a local anesthetic and use the ultrasound transducer or wand to study the vein and track its path.

A very small skin incision is made at the site.

Using ultrasound guidance, a catheter or vascular access sheath is inserted through the skin and positioned within the abnormal vein. The laser fiber or radiofrequency electrode is inserted through the catheter and the tip of the fiber or electrode is exposed by pulling the catheter back slightly.

Local anesthetic is injected around the abnormal vein with ultrasound guidance. Laser or radiofrequency energy is applied as the catheter is slowly withdrawn.

Pressure will be applied to prevent any bleeding and the opening in the skin is covered with a bandage. No sutures are needed.

This procedure is usually completed within an hour.

## What will I experience during the procedure?

You will be asked to wear protective glasses if and when lasers are in use.

An area of your leg will be cleaned and numbed.

You will feel a slight pin prick when the local anesthetic is injected at the vein access site and during injection of the local anesthetic along the length of the vein.

This area will become numb within a short time.

You may feel slight pressure when the catheter is inserted, but no serious discomfort.

Injection of local anesthetic around the abnormal vein is the most bothersome part of the procedure because it usually requires multiple injections along the vein. Actual closure of the vein with laser or radiofrequency is usually not painful. Occasionally, some people report a smell or taste of something burning during the vein closure.

Following the procedure, you will need to wear a gradient compression stocking to help reduce bruising, tenderness, and minimize the rare possibility that blood clots may form.

You may resume your normal activity immediately, with the exception of air travel or prolonged sitting (such as a long car trip). You should remain active and not spend too much time in bed during the recovery period since this increases the chance of complications. However, strenuous physical activity should usually be avoided for some period of time following the procedure.

## Who interprets the results and how do I get them?

A follow up ultrasound examination is essential in order to assess the treated vein and to check for adverse outcomes. Within one week, the target vein should be successfully closed. Additional procedures (such as sclerotherapy or phlebectomy) may be necessary to treat associated veins.

## What are the benefits vs. risks?

### Benefits

- No surgical incision is needed—only a small nick in the skin that does not have to be stitched.
- When compared with traditional vein stripping techniques, endovenous ablation is more effective, has fewer complications, and is associated with much less pain during recovery.
- Endovenous ablation is generally complication-free and safe.
- This procedure leaves virtually no scars because catheter placement requires skin openings of only a few millimeters, not large incisions.
- Endovenous ablation offers a less invasive alternative to standard surgery.
- Most of the veins treated are effectively invisible even to ultrasound 12 months after the procedure.
- Most patients report symptom relief and are able to return to normal daily activities immediately,

with little or no pain.

## Risks

- Any procedure where the skin is penetrated carries a risk of infection. The chance of infection requiring antibiotic treatment appears to be less than one in 1,000.
- Any procedure that involves placement of a catheter inside a blood vessel carries certain risks. These risks include damage to the blood vessel, bruising or bleeding at the puncture site, and infection. However precaution is taken to mitigate these risks.
- Some post-procedure bruising and tenderness may occur, but may be eased by wearing a compression stocking.
- Some instances of thermal (heat) damage to nerves have been reported. This is rare and generally goes away in a short time.
- Thrombophlebitis (inflammation of the vein) is not uncommon and may cause pain and redness over the treated area, but generally responds well to nonsteroidal anti-inflammatory drugs (NSAIDs) as well as ice over the area.
- Blood clots that formed in the veins can travel to the lungs (pulmonary embolism); however, this is an extremely rare occurrence.

## What are the limitations of Endovenous Ablation of Varicose Veins?

Ablation catheters cannot be easily passed through a vessel with many turns and bends (tortuous vein). Consequently, endovenous ablation is typically used to treat dominant superficial veins that lead to varicose veins, such as the great saphenous vein, which extends from the groin and inside of the thigh to the ankle. It is also commonly used for other dominant superficial veins such as the small saphenous vein and accessory saphenous veins.

Endovenous ablation is successful at closing the abnormal target vein almost 100 percent of the time, but small dilated branches that persist in the skin (varicose veins) often require additional treatment with phlebectomy (minor surgical procedure to extract them) or sclerotherapy (injection of a liquid medication to seal them off). Subsequent treatments are usually scheduled after an ablation procedure, but phlebectomy can also be performed at the same time as endovenous ablation when appropriate.

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