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## **Radiofrequency treatment for trigeminal neuralgia**

### **What is trigeminal neuralgia?**

Trigeminal neuralgia is a condition in which severe attacks of pain occur in one side of the face. The attacks are usually short in duration, but are very severe. They can occur only occasionally, or many times in a day. They can occur without warning, but are typically triggered by eating, talking, sneezing, or even by wind blowing against the face. The pain is usually felt in the upper or lower jaw, in the cheek, the side of the nose, near the ear and often in the teeth. Many people with trigeminal neuralgia have had extensive dental treatment without success.

### **What causes trigeminal neuralgia?**

Trigeminal neuralgia is caused by a blood vessel pressing against the trigeminal nerve in the brain. The trigeminal nerve is one of the main nerves of the head (there is one for each side), being responsible for sensation in the face, mouth, tongue and teeth. As people grow older, blood vessels everywhere in the body become longer. What were straight blood vessels earlier in life become tortuous later in life. Trigeminal neuralgia can occur when an otherwise normal blood vessel, having become tortuous over time, happens to press part of itself against the trigeminal nerve, just at the point where the trigeminal nerve leaves the brain itself.

In rare situations, trigeminal neuralgia can be caused by other conditions. Usually this will have been discovered with investigations done prior to treatment.

### **What is the radiofrequency treatment?**

Radiofrequency treatment is performed using a special needle known as an electrode. The electrode is connected to a machine (radiofrequency generator) and the tip of the needle can be heated to certain temperatures extremely accurately. It is the heat at the tip of the needle which is used to carry out the radiofrequency treatment.

When radiofrequency treatment is used in the treatment of trigeminal neuralgia, the electrode is passed from the cheek through a small hole in the base of the skull into the trigeminal nerve. The nerve is then heated using the radiofrequency machine. In this way, the nerve is deliberately partly damaged. The object of the treatment is to destroy the pain fibres in the nerve (which have little insulation against the heat) without affecting the touch fibres (which have a thick insulation). This can mean that under ideal circumstances the pain is abolished but without permanent numbness.

There is a fine line between producing insufficient damage to the nerve, with no relief from trigeminal neuralgia, and producing too much damage which can lead to unwanted permanent numbness.

## **Who is best suited to radiofrequency treatment?**

Most neurosurgeons agree that the best treatment for trigeminal neuralgia is the major operation known as microvascular decompression. In this operation, an opening is made in the skull and the surgeon identifies the blood vessel pressing on the trigeminal nerve. The blood vessel is moved away from the nerve and a special material is placed between the blood vessel and the nerve. It is a highly effective operation, but does carry some risks of damage to the nerves or even to the brain itself. As with most operations, the risks are greater in older age groups, and it is in people over 70 where radiofrequency treatment is an excellent alternative to microvascular decompression. Radiofrequency treatment can achieve similar results without significant risk.

## **Which is better treatment?**

Neither microvascular decompression nor radiofrequency treatment is better than the other. Microvascular decompression has a much better success rate than radiofrequency treatment, but is not a realistic option for elderly people or for those with significant heart or lung disease. However, radiofrequency treatment does have a relatively high failure rate.

## **How is radiofrequency treatment actually performed?**

While it can be done on a same day basis, it is more likely that you would be admitted the day before and go home the day after the treatment. The treatment is usually performed in the operating theatre, but can be done in the x-ray department too. An anaesthetist will begin by putting a needle in the back of the hand, and you will be positioned on the operating table lying flat on your back, but with the head comfortably supported on a pillow. The procedure itself then consists of three separate phases.

The first phase is where the needle is placed into the trigeminal nerve. This is done with a combination of local anaesthetic in the cheek and intravenous medication that causes a pleasant degree of sedation. An xray is used to confirm that the needle is in the correct position, passing from a point just beside the corner of the mouth up to the base of the skull. Once the needle is in the correct position, the sedation is ceased and you wake up more fully. Usually the first phase takes less than ten minutes.

In the second stage, the needle is connected to the radiofrequency machine. Very mild electrical stimulation is then used, which will cause a strange tingling feeling in the face. You will then be asked to describe where you feel the sensation. If this is in the same area as you normally feel the trigeminal neuralgia, then it means that the needle is in the correct position. If not, the needle is slightly adjusted and the stimulation is repeated until the right response is obtained. This phase is not painful, just rather strange.

Once the needle is in the right place, a full general anaesthetic is used and the machine heats the tip of the needle. After about two minutes, the machine is switched off and the anaesthetic is ceased. You will then wake up in a minute or two, and will be wide awake in half an hour or so. It is likely that you will

remember very little of the first two phases, and certainly you will be unaware of the third phase.

**Will I have any numbness?**

It is quite likely that you will have some numbness after radiofrequency treatment. It is usually only partial numbness, and most times it disappears gradually over several weeks. It is normally felt in the chin, or the tongue, or the cheek or side of the nose.

**What is the success rate?**

The success rate is about 75 percent. Considering that that the risks are low compared with more major surgery, the success rate is reasonably favourable. But you can see that it is far from perfect, with approximately every fourth person having a disappointing result. The chances of the treatment making the trigeminal neuralgia worse are low, but approximately one person in every two hundred can be made worse.

**Can radiofrequency treatment be repeated?**

Yes, it can. A successful treatment usually lasts a year or more, but a repeat treatment is the rule rather than the exception.

A handwritten signature in black ink, appearing to read 'P. D'Urso', with a stylized flourish.

Prof. Paul D'Urso  
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