

Department of Neurological Surgery
John Radcliffe Hospital

Thalamotomy and Pallidotomy

Pre-operative information
for people with tremor and/or Parkinson's disease



We have been able to help many people with tremor and/or Parkinson's disease using the surgical procedures thalamotomy and pallidotomy. This information booklet will give you more information about having a thalamotomy or pallidotomy and should answer some of your questions.

If there is anything else you would like to know, please contact the Movement Disorder Team (see the end of the booklet for contact numbers).

Thalamotomy

Tremor can be a symptom of a number of different disorders, some of which are hereditary (passed from parents to children). Sometimes tremor can occur as a result of a head injury or stroke but sometimes the cause is not known. Tremor may also be one of the symptoms of Parkinson's disease (PD).

Thalamotomy is a surgical procedure used to treat tremor. It involves destroying a tiny area in a part of the brain called the thalamus. The area which has been destroyed is called a 'lesion'.

The disadvantage of this procedure is that it can only be performed on one side of the brain and is therefore not as useful for people with tremor in both hands.

Pallidotomy

Pallidotomy is a surgical procedure which involves destroying a tiny area in a part of the brain called the Globus Pallidus interna (GPi or pallidum).

Some people with Parkinson's disease (PD) are offered a pallidotomy to help improve some of their symptoms. Pallidotomy can help particularly with rigidity (stiffness) and dyskinesias (involuntary movements) caused by some PD medications. It may also help to improve tremor and the severity of your 'off state' (when your medication has worn off), but this doesn't happen with all people. This procedure is usually only performed on one side of the brain to improve symptoms on the opposite side of the body but, despite this, it can sometimes help both sides of your body.

Assessment

You will be seen in clinic first of all by members of the Movement Disorder Team, including a consultant neurologist or neurosurgeon. They will discuss your symptoms with you and any treatment that you have tried in the past. They will carry out a physical examination on you to assess your tremor or PD symptoms.

If the team recommends surgery then they will talk to you about what the surgery involves. They will give you the opportunity to ask further questions about the surgery and your care afterwards.

You will be asked whether you wish to go ahead with the surgical treatment, but you can choose to go away and think about whether you feel it would be right for you. You will not be put under pressure to make a decision on the day of your appointment.

Your admission to hospital for further assessment

Assessing your tremor or PD symptoms includes making video recordings whilst you are doing various activities. This helps us to see your symptoms in different situations. If you have tremor that is not due to PD, we will measure your tremor using a special recording device on your wrist (like a wrist-watch).

You will also need to have a Magnetic Resonance Imaging (MRI) brain scan. This scan helps the surgeon to see the area that will be targeted during the operation. To get the best picture on this scan we may need to sedate you to make you relaxed and help to control your tremor. We will discuss with you whether you feel that you would be able to keep completely still for the scan without sedation.

This MRI may be carried out during your main assessment or it may require a separate appointment. Some people need a general anaesthetic for the scan (an anaesthetic to make you sleep). If you need this we will arrange a separate date for you to be admitted to hospital for your MRI scan to be done as a day case procedure. This means that you would need to be in the hospital early in the morning but would be able to go home later on the same day. You will be told the approximate time of the scan and when you would need to stop eating and drinking beforehand in preparation.

A neuropsychological assessment is also part of the assessments carried out before surgery. This looks at memory, mood and the way you think.

The assessment is an opportunity for the team to have a look at your symptoms to see whether a thalamotomy or pallidotomy would help you. If, after the assessment, we feel that surgery would not be appropriate, it will not be offered. If this is the outcome for you, you will have an opportunity to discuss this decision with the team if you would like to do so.

We may be able to give you the results of the assessments and the decision as to whether or not surgery is appropriate for you before you go home. If not, we will contact you when you are back at home. You will be able to discuss the results with one of the consultants if you wish; this may need to be at another clinic appointment.

Consent

Our aim is to make sure that you have enough information to help you make an informed decision about whether to go ahead with surgery or not. You should have the opportunity to talk with different members of the Movement Disorder Team about any concerns or queries that you may have. If you decide to go ahead with surgery, having been told that you are suitable for a thalamotomy or pallidotomy, a surgeon who understands all the possible risks and benefits will explain the operation to you. If you are happy with the explanation you will then be asked to sign a consent form before the operation takes place. The main risks and benefits are described later in this information leaflet.

Precautions

It is important that you stop taking certain drugs before surgery, especially ones that thin your blood. It is very important that you contact the hospital at least two weeks before your admission if you are taking:

- aspirin
- warfarin
- clopidogrel
- any other drugs which thin the blood
- some types of painkillers, such as ibuprofen and diclofenac (Voltorol).

If you are taking warfarin we may need to admit you earlier before your operation.

It is very important that you tell us about any new symptoms or medical diagnoses that develop whilst you are waiting for surgery, as these may mean we have to change the surgical plan.

As each person is different, it is important that you phone the hospital team so that we can discuss a plan for you.

Your admission for surgery

Whilst we make every effort to ensure your admission can go ahead as planned, the John Radcliffe Hospital is a regional centre for Neurosurgery and takes emergency cases. This may mean your admission is postponed.

People are normally admitted to hospital on a Tuesday or Wednesday. Your main operation will be done on the Wednesday or Thursday and usually takes place first thing in the morning. You will be in hospital for around 5-7 days.

The day of surgery

The nurse will tell you when to get ready for theatre. You will be asked to wear a theatre gown and special stockings to reduce the risk of a blood clot (deep vein thrombosis) developing in your leg.

The anaesthetist will also see you to talk to you about the anaesthetic. Thalamotomy for tremor or pallidotomy for PD has to be done with you awake, so that we can see what effect stimulation is having on your symptoms. When it's time, the nurse will take you down to the anaesthetic room, where you will be prepared for your operation.

The operation

On the day of surgery you will first be taken to the anaesthetic room in theatres. Local anaesthetic will be injected into your scalp at four sites. These will be where pins will temporarily fix the stereotactic (head) frame to your skull. This may occasionally be done on the ward, before you are brought to theatres. People have described this as feeling like four "bee stings" until the skin goes numb.

When your skin is numb the four pins will be inserted. They are designed to pierce the skin and screw a few millimetres into the bone. You will then have the stereotactic frame fitted to the pins.

Wearing the frame has been likened to "wearing a hat several sizes too small". A mild sedative (to make you feel sleepy) can be given during this procedure to help with any discomfort.

You will then have a CT (Computerised Tomography) scan which will help us to work out where the electrodes will need to go in relation to the metal frame. The frame must stay on for the surgery. It is used to hold your head in one place during the operation and will allow the surgeon to pass the wires accurately

to the correct position in your brain. It will be removed as soon as the operation is over.

The surgeon will inject some more local anaesthetic into your scalp to numb the skin further. They will then drill a small hole (about 3mm wide) into your skull, on one side of the top of your head. This will allow the surgeon to put the electrode into your brain at the calculated site.

We will then test the site to see if we can control your tremor or PD symptoms without causing you to have any side effects, such as slurred speech or pins and needles in your hand or arm. If we manage to do this successfully, the surgeon will pass a small electric current through the wire to heat it up and destroy a tiny area around it. If we are unable to control your tremor or PD symptoms without causing side effects we may have to remove the electrode and stop the operation.

After the procedure the frame is removed from your head. When the pins are unscrewed, the four holes may leak a little blood or fluid, but won't usually need stitches. The whole procedure will take approximately 2 hours but this does vary from patient to patient. An MRI scan will be done the next day to confirm the position of the lesion in your brain.

After the operation

After the operation you will be taken to the recovery room for a short while. There may be a drip in the back of your hand for giving drugs or fluids. You will then be taken back to the ward where we will monitor your pulse, blood pressure and wound regularly. We will offer you regular pain relief. It is important that you tell a nurse if you are feeling sick or if you have pain so we can help make you comfortable. It is also important that you change your position in bed at least once every 2-3 hours to avoid prolonged pressure on individual parts of your body; the nurses will help you if necessary.

When your condition is stable you will be allowed to get out of bed. Be careful not to do too much. The next few days should be seen as an important part of your recovery process.

Going home

You should be ready for discharge from hospital 2-3 days after your operation. You will be in hospital for about 5-7 days in total.

We advise you to take 4-6 weeks off work. You will also need to contact the DVLA as it is likely that they will ask you not to drive for a period of 6 months after your surgery.

You will only have 1 or 2 stitches, which can be removed approximately 5-7 days after the operation. We will give you a separate leaflet written by The Movement Disorder Team that contains more information about this and other advice about going home.

By the time you leave hospital we would expect you to be able to care for yourself as you did before the surgery but it may be sensible to make arrangements for help with shopping, housework, gardening and caring for small children.

Follow-up

We will see you approximately 6 weeks after your surgery. The arrangements for long term follow-up will be discussed at this appointment.

Risks and complications

As with all types of surgery, thalamotomies and pallidotomies involve some degree of risk and the chance of complications.

- The most serious complication is a 0.5% (1 in 200) chance of stroke from this procedure. A stroke is a bleed into the brain. This can result in weakness down one side of the body, speech difficulties or damage to sight. How much a stroke affects a person depends on the position of the bleed and how severe it is.
- The surgery may not provide the improvement in symptoms that had been hoped for.
- There is a very small risk of infection in the wounds.
- There is a small risk of the surgery causing epilepsy. This risk is less than 1% (less than 1 in 100).
- The risk of death resulting from the operation is very small, at around 0.2% (1 in 500).
- As the lesion that is made during the operation is permanent, if there are any unwanted effects such as slurred speech or pins and needles or weakness, they may also be permanent. However, these unwanted effects often lessen over the weeks or months following the operation.

Benefits

Surgery on the thalamus can significantly improve the quality of life for people with tremor. The aim of a thalamotomy is to help to reduce the severity of your tremor. It will not provide a cure for the underlying cause. How much improvement people get is different from one person to another. The procedures will not improve any ataxia (uncoordinated movements) you have in addition to the tremor. We may be able to improve your tremor so that the violence of the movement doesn't interfere with activities, but your control of fine movement may not improve.

On average people achieve around an 80-90% improvement in their tremor, although some people will experience less than this. It is never possible to be absolutely certain before the operation of the amount of tremor reduction that will be achieved.

Surgery on the pallidum can significantly improve the quality of life for people with Parkinson's disease by reducing stiffness and dyskinesias as well as sometimes also improving the severity of tremor and the off medication state. If you would like to speak to someone who has had either of these treatments, please let us know. We will be happy to put you in contact.

If you have any questions that you would like to ask, please do not hesitate to contact the Oxford Movement Disorder Team. Please see the end of the booklet for contact numbers.

How to contact us

Consultant's secretaries: 01865 234 605

01865 231 782

01865 572 466

Consultant Neuropsychologist: 01865 234 264

Movement Disorder Team Nurses: 01865 231 873

01865 231 875

01865 231 876

**Functional Neurosurgery
Service Administrator:** 01865 572 466

**Neuroscience inpatients
ward reception:** 01865 231 526

If you have a specific requirement, need an interpreter, a document in Easy Read, another language, large print, Braille or audio version, please call **01865 221 473** or email **PALSJR@ouh.nhs.uk**

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