Cranial surgery for pituitary tumour

Turnberg Building
Neurosurgery Department
0161 206 4340
You have been referred for an operation for an abnormality within or near the pituitary gland. We find that most patients have similar concerns and this patient information booklet is intended to explain some of the surgical aspects of your treatment and hopefully to put your mind at ease.

There are also useful contact details for further information and advice in this leaflet.

Your surgical and endocrine teams will be happy to explain any further queries and unfamiliar terminology.

Manchester Pituitary team:

The Pituitary surgical service in Manchester is one of the busiest in the country, serving a population of approximately 3.5 million adults and 5 million children.

Pituitary surgery is undertaken on adults at the Salford Royal NHS Foundation Trust (SRFT) and in children at the Royal Manchester Children’s Hospitals (RMCH).

We also accept and treat patients referred from outside of the Manchester region, including overseas patients. New patient referrals from within the UK require a referral letter from the patient’s General Practitioner.

Pituitary surgery in Manchester is undertaken by the Neurorsurgeons: 
Mr Kanna Gnanalingham and Mrs Konstantina Karabatsou.

As part of a multi-disciplinary team (MDT), the pituitary surgeons work closely with the endocrinologists across the Greater Manchester region.

Other key members of the team include the Neuroradiologists, Oncologists, Neuro-ophthalmologists and the Specialist nurses.

All surgical patients are discussed on a regular basis at the Manchester Pituitary MDT meeting, in accordance with NICE guidelines.
What is a Pituitary Tumour?

The pituitary gland is the key hormone producing organ, which is situated at the base of the brain, approximately 5cm behind the tip of the nose (Figure 1a).

The pituitary gland produces 8 different hormones that control a number of functions throughout the body including general well being, ability to cope with stresses of life such as infection, body growth, sexual function, thirst, metabolism as well as energy levels.

Pituitary tumours (Figure 1b) are relatively common. Indeed, studies suggest that between 10-20% of the general population may possess a pituitary abnormality. However, most of these remain very small and do not cause any problems and only a small proportion cause symptoms requiring medical treatment. Pituitary adenomas account for approximately 90% of all pituitary tumours. The vast majority (99% or more) of pituitary tumours are benign and not cancers.

Most pituitary tumours cause symptoms due to pressure on nerves that control your vision (eg loss of peripheral vision) and/or due to changes in hormone levels produced by the pituitary gland. They are slow growing and the patients generally do well with treatment.

What are the treatment options?

Treatment options for pituitary tumours include surgery, medications and/or radiotherapy. The choice of treatment will be dependant on a number factors including your tumour type, tumour size, severity of symptoms, your age, general well being and your preferences.

As most pituitary tumours are benign and slow growing, there is also the option of waiting (ie conservative approach), with regular clinical review and MR scans to check for any increase in size of the lesion.

Your surgical and endocrine teams will discuss the advantages and disadvantages of each option and help to decide the best treatment plan in your case.
**Why do I need cranial surgery?**

In patients with pituitary tumours, very occasionally an operation through the skull (ie cranial surgery) is necessary (Figure 2b). This is usually because an operation through the nose was unable or unlikely to adequately remove most of the tumour in the first instance.

In addition a variety of other lesions can be encountered around the pituitary gland, which may also be operated by cranial surgery.

With respect to surgery, there are a number of different ways in which your surgeon can reach the pituitary tumour. The vast majority (ie more than 90%) of patients with pituitary tumours who require surgery are operated through the nose, the so called trans-sphenoidal surgery (Figure 2a) (see separate patient information leaflet).

You may therefore undergo cranial surgery for the following conditions found around the pituitary area, including:

- Very large pituitary adenoma remnant (Figure 3a)
- Large craniopharyngiomas (Figure 3b; developmental abnormalities)
- Meningiomas of anterior skull base (Figure 3c)
- Infection around the Pituitary
- Tumour spread from elsewhere in the body (ie Metastasis)
- Meningoencephaloceles (developmental abnormalities)
What are the benefits of surgery?

The aim of surgery is to remove as much of the tumour as safely as possible. This will also allow the precise histological diagnosis of the lesion.

Tumour removal will relieve any pressure on nearby brain and important nerves, including those that enable for you to see. Visual improvement may be apparent after surgery. However, the extent and speed of this visual improvement depends on a number of factors including how poor your vision is before surgery. Your surgeon will be able to advice further on this.

What happens before surgery?

You will be seen by your surgical team at Salford Royal NHS Foundation Trust (SRFT), who will go through the nature of surgery in detail. Your surgeon will also usually arrange a special image guidance scan to take place at SRFT that helps your surgeon plan and undertake the operation safely.

At the end of your neurosurgical clinic visit, you will also need to attend a pre-operative clinic, in which you will be assessed from a general health point of view. On occasions, further anaesthetic or medical reviews will also be requested prior to surgery.

Your pituitary hormone blood tests will also be checked before surgery and sometimes hormone treatment, or additional tests, may be needed prior to your operation. This will be over seen by your endocrine team.

Once deemed fit to proceed with surgery, you will usually be admitted on the day of surgery to the Surgical Admission Lounge (SAL) at Salford Royal.

Your surgical team will write to you with further details about this. For any queries about date of admission, please liaise with your surgeon’s secretary (see contact details at end).

What should I do about my medications?

You should continue your normal medication unless you are told otherwise in the pre-operative clinic.

Blood thinning medications such as warfarin, clopidogrel or aspirin, will need to be discontinued 5-10 days before surgery to minimise the risk of bleeding during surgery. Follow your surgeon’s advice about stopping these medications before the operation.

Which cranial approach?

In cranial surgery, there are a number of different ways in which your surgeon can reach the pituitary tumour (Figure 4). Depending on the size and location of the pituitary tumour the surgery may be done through an incision behind the hairline (eg fronto-temporal or midline frontal approaches) or over the eyebrow.

Your surgeon will discuss the advantages and disadvantages of each approach in your case.

Figure 4: Various cranial approaches
What does the operation involve?

Surgery is performed under a general anaesthetic. Depending on the nature, size and shape of your tumour, the operation can take between 2 to 6 hours. Your surgeon will be able to advise further.

The skin cut will be made just behind the hairline or over the eyebrow to reveal the surface of the skull. A variable size of skull bone is cut out. Your surgeon will work through this skull opening to carefully reach the pituitary tumour, whilst minimising any damage to normal brain.

The pituitary tumour is removed with the aid of the operating microscope and using specially designed surgical instruments.

In some cases a fine tube may be placed in the middle of tumour cyst and connected to a plastic reservoir that sits under the scalp. This will enable the surgeon to drain the tumour fluid again, without the need for open surgery. This is referred to as placing an ‘Omaya reservoir’ (Figure 5).

At the end of the operation the piece of skull bone is replaced and secured to the rest of the skull with small metallic plates. The cut on the scalp is closed with sutures or metallic clips. There may be a temporary wound drain left in place to drain any excessive accumulation of blood and this is removed after 24 hours.

What complications can happen?

Cranial surgery for pituitary tumours is relatively safe and most patients do well from surgery and go home 4-7 days later.

We will do our best to ensure that your operation is undertaken as safely as possible. However, complications can happen and some of these can be serious. The likely risks of complications are obtained from large studies carried out in both our unit in Manchester and elsewhere in the world. Your surgeon will be able to tell you if the risks in your case are higher or lower.

In most patients with pituitary tumours, cranial surgery carries less than 1 in 1000 risk of very rare but major complications such as death, injury to major blood vessels and blindness.

The risks of less severe complications are around 15-20%, but this will vary between patients.

Figure 5: Aspiration of Omaya reservoir
These complications include infection, meningitis, bleeding, stroke (from damage to brain and nerves), fits, leakage or build up of brain fluid (also known as cerebrospinal fluid, CSF) and the need for surgery for this. Following surgery the normal pituitary gland may also fail to function properly with a small risk of infertility. In many cases, this is temporary, although in some cases this might be permanent, requiring the need for life long replacement of one or more hormones.

There are also risks related to the general anaesthetic and other general medical complications such as chest infections, heart disease and deep venous clots. The anaesthetist and the pre-operative clinic team will be able to advise further with regard to this.

There is a possibility of some tumour being left behind, which may require further surgical, medical and/or radiotherapy treatments. Your surgeon will be able to explain the likelihood of this in your case.

What is my recovery likely to be?

Recovery in hospital

After the operation you will be transferred to the recovery area in theatre and then to the monitored bay of the neurosurgical ward.

Soon after surgery, you may experience some headaches, nausea and pain over the scalp wound. Over the first few days there may be progressive swelling over your wound that may also extend to your forehead, with associated bruising and swelling of your eyes. This is due to blood and tissue fluids accumulating under the wound and will gradually improve after the first few days.

The nurses and your physiotherapist will help you to start walking as soon as possible. They will also carry out regular observations on your vital signs, including your vision.

The medical team will want to know all about how much fluid you are taking in and passing out in your urine and therefore you will be on a strict fluid balance chart. Very occasionally the part of the pituitary gland, which helps control the volume of urine can be disturbed and you may start to produce a lot of urine and be very thirsty. This is called diabetes insipidus (DI) and is usually temporary and is treated by increasing your fluid intake.

DI is not the same as Diabetes mellitus, which is related to high blood sugars.

Most patients are able to go home after 4-7 days, without any complications. Most patients will be discharged home on oral pain killers and steroid (hydrocortisone) tablets in addition to your other medications.
Recovery after going home

We advise that you have somebody at home in the first 1-2 weeks when you are discharged as you may be tired and may need extra help with household chores.

If you develop worsening symptoms such as headaches, vomiting, visual blurring and/or persistent discharge from the wound it is important that you contact the ward or your surgeon (see contact details at end). These symptoms may need further assessment (eg blood tests and brain scans) and treatment.

Persistent wound discharge may suggest a wound infection or a CSF leak. If this continues, bacteria can creep into the brain, which can lead to infection of the brain (ie meningitis). Thus, early investigations and aggressive treatment is very important and you may need to be readmitted for this.

Your wound sutures or clips are removed at 5-7 days following surgery. This will usually be carried out by your General practice nurse. You should avoid wetting the wound till then. The surgical team will advice further on this.

On discharge most patients are also reviewed in the endocrine clinic or Medical Investigational Unit (MIU), usually at 2 weeks after surgery. The endocrine nurse specialists will give you more information about the location and timing of these endocrine tests. You will have blood tests that check your pituitary function, including your body’s salt and water control.

A small number of patients can develop delayed problems with salt/water balance at 1-2 weeks after surgery, with a tendency to retain fluid.

This condition is called Syndrome of Inappropriate Antidiuretic Hormone (SIADH) and the patient feels tired, headachy and nauseous. Once confirmed by blood and urine tests the condition usually gradually resolves by restricting the patient’s daily fluid intake.

You will also need to have a repeat visual assessment and a MR scan usually at 6 months post-operatively. The endocrine team will confirm when and at which hospital you will have these tests. This MR scan will clarify if there is any residual tumour and whether you will need further surgery and/or radiotherapy.

You should continue to take your medications including the hydrocortisone tablets until advised otherwise by your endocrine team. You may also need to get a repeat prescription from your GP.

You will also be reviewed by your surgeon in the neurosurgical clinic usually at 2-3 months after your operation. Your surgeon will clarify the frequency of subsequent clinic appointments and brain scans.

We advise that you have somebody at home in the first 1-2 weeks when you are discharged as you may be tired and may need extra help with household chores.

If you develop worsening symptoms such as headaches, vomiting, visual blurring and/or persistent discharge from the wound it is important that you contact the ward or your surgeon (see contact details at end). These symptoms may need further assessment (eg blood tests and brain scans) and treatment.

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**Returning to normal activities**

Most patients make a gradual recovery following trans-cranial pituitary surgery. However, it is common for most patients to feel tired and ‘run down’ especially in the first few weeks after surgery. It is best therefore not to attempt any strenuous activity over this time. It is also best to avoid long distance travel, including travel by air for 6 weeks following surgery.

After cranial surgery, **you should not drive**, until instructed to do so by the Driver and Vehicle Licensing Agency (DVLA). This time period is variable and in part depends on a number of factors including the severity of any visual problems, other neurological problems and the risk of fits. You need to contact the DVLA (contact details are on the back of your driving license) and alert them of your medical condition and the name of the doctors treating you.

After collecting reports from your doctors, an independent medical team at the DVLA will confirm when you can restart driving. You should also inform your insurance company before recommencing driving.

With respect to **return to work** and other activities, a gradual return is advisable at 6-10 weeks following surgery. The speed of return to normal life partly depends on the nature of your employment and whether you suffered any complications after your operation.

Your surgical and endocrine teams will be able to advise further.

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**What can I do to help make the operation a success?**

If you smoke, try to **stop smoking** now. Stopping smoking several weeks or more before an operation may reduce your chance of getting complications and will improve your long-term health. For help and advice on stopping smoking you can liaise with your GP or the pre-operative clinic team.

For information on how exercise can help you can liaise with your GP or the pre-op clinic team.

**Regular exercise** can reduce the risk of heart disease, improve how your lungs work and help you to control your weight. Exercise is also likely to help with your recovery and improve your long-term health.

For information on how exercise can help you can liaise with your GP or the pre-op clinic team.

**www.gosmokefree.co.uk**

**www.eidoactive.co.uk**

**www.eatwell.gov.uk**
Things NOT to do after discharge from hospital:

- No flying for at least 6 weeks
- No driving of vehicles until instructed to do so by the DVLA or your doctors
- No strenuous household activities for 4-6 weeks (e.g., cleaning, gardening, etc.)
- No strenuous exercise for 4-6 weeks
- Stay away from anyone with a cold/cough/chest infection for 6 weeks
- Avoid pets that tend to lick for 6 weeks
- Do not stop hydrocortisone until instructed to do so

Symptoms you should alert us to:

- Worsening headaches or a sudden severe headache
- Any persistent clear fluid dripping from the nose
- High temperature, neck stiffness and intolerance of bright lights
- Deterioration in vision
- Feeling nauseous and being generally unwell

On discharge after surgery best way to contact us:

- Telephone the Neurosurgical ward you were discharged from
- Telephone the Neurosurgical Consultant’s secretary
- Telephone your endocrine team

Summary

Pituitary tumours are relatively common benign tumours of the brain. The vast majority of these are operated through the nose. Cranial surgery is only necessary for a small number of patients with very large pituitary tumours and other lesions around the pituitary gland. Cranial surgery is usually safe and effective. Patients with pituitary tumours generally do well with treatment and lead near normal lives. All patients with pituitary disease are assessed and treated by a multi-disciplinary team.
Useful contact details:

For any queries please contact the relevant consultants or your designated endocrine nurse specialists at the numbers below.

Mr Kanna Gnanalingham
Consultant in Neurosurgery
Greater Manchester Neuroscience Centre
Salford Royal NHS Foundation Trust,
Stott Lane, Salford M6 8HD, UK
Secretary: Kate Roszkowska
kate.roszkowska@srtf.nhs.uk
0161 206 4340
Fax: 0161 206 4606

Mrs Konstantina Karabatsou
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Greater Manchester Neuroscience Centre
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Secretary: Angela Royle
angela.j.royle@srtf.nhs.uk
0161 206 8338
Fax: 0161 206 4606

Drs Tara Kearney & Annice Mukherjee
Consultant in Endocrinology
Department of Endocrinology
Salford Royal NHS Foundation Trust,
Stott Lane, Salford M6 8HD, UK
Secretary to Dr Kearney: Lorenza Ashburner
lorena.ashburner@srtf.nhs.uk
0161 206 5693
Secretary to Dr Mukherjee: Carol Cartwright
carol.cartwright@srtf.nhs.uk
0161 206 5153

Endocrine Specialist Nurses, Salford Royal
Sisters Shashana Shalet (Pituitary key worker) & Kathryn Kinsella
Department of Endocrinology
Salford Royal NHS Foundation Trust,
Stott Lane, Salford M6 8HD, UK
0161 206 7036/7038/4625
Fax: 0161 206 5989

Endocrine Specialist Nurse, MRI
Sister Chris Gibson (Pituitary key worker) & Nicci Komlosy
Department of Endocrinology
Manchester Royal Infirmary (MRI)
0161 276 8610
Fax: 0161 276 4977

Endocrine Specialist Nurses, The Christie Hospital
Department of Endocrinology
The Christie Hospital
0161 446 3479
Fax: 0161 436 3772

Endocrine Specialist Nurse, The Pennine Acute Trust
Department of Endocrinology
The Pennine Acute Trust
0161 778 5462

Other contact numbers at Salford Royal NHS Foundation Trust

Ward H7 0161 206 4610 / 5679
Ward B7 0161 206 4571 / 4572
Ward B8 0161 206 1290 / 1297
NHDU 0161 206 5055
(Neuro High Dependency)
MIU 0161 206 4884 / 5688
(Medical Investigational Unit)
CT scanner 0161 206 2115
MR scanner 0161 206 2091
Ophthalmology services at SRFT 0161 212 4018

Useful web links:

Pituitary Foundation
(UK based website)
www.pituitary.org.uk
0845 450 0375

(Please note that charges will apply for telephone calls)
For further information on this leaflet, it’s references and sources used, please contact 0161 206 4340.

Copies of this information are available in other languages and formats upon request.

In accordance with the Equality Act we will make ‘reasonable adjustments’ to enable individuals with disabilities, to access this treatment / service.

If you need this interpreting please telephone

Polish
Jeżeli potrzebne jest Państwu to tłumaczenie, proszę zadzwonić pod numer.

Urdu
اگرآ اپ کواس ترجمانی کی ضرورت بہ تو مہربانی کر کے فون کریں.

Arabic
إذا كنت بحاجة إلى تفسير أو ترجمة هذا الرجاء الاتصال

Chinese
如果需要翻译，请拨打电话

Farsi
اگر به ترجمه این نیاز دارید ، لطفا تلفن کنید 01612060224

Email: InterpretationandTrans@srft.nhs.uk

Salford Royal operates a smoke-free policy.

For advice on stopping smoking contact the Hospital Specialist Stop Smoking Service on 0161 206 1779

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www.srft.nhs.uk/for-members

If you have any suggestions as to how this document could be improved in the future then please visit:
http://www.srft.nhs.uk/for-patients