NHS
Lancashire Teaching Hospitals
NHS Foundation Trust

Information for patients and carers

Mohs Micrographic Surgery (MMS)

Lancashire Plastic Surgery Mohs Unit

Introduction

The aim of this leaflet is to provide you with information regarding Mohs Micrographic Surgery (MMS). It describes what MMS is and how it is done. You will also find information on the benefits and potential complications here. We have tried to provide answers to commonly asked questions, however, if you are unable to find the answer to your question, please get in contact with our team – details are given at the end of the booklet.

What is Mohs Micrographic Surgery (MMS)?

Mohs Micrographic Surgery (MMS) is often shortened to 'Mohs Surgery'. It is named after Dr Frederic Mohs who invented the procedure whilst a medical student in the 1930s.

Mohs surgery is a specialised process for ensuring complete tumour clearance whilst minimising the amount of normal surrounding tissue removal. It is commonly used to treat Basal Cell Carcinoma (BCC) but can be used to treat other skin cancers. Its greatest value is where tumours are close to important structures; where tumours are difficult to see fully; or in recurrent / incompletely removed tumours.

Mohs surgery involves 'real-time' analysis of the whole surface of the tumour, so results are available whilst you wait. Any remaining tumour can then be removed whilst you remain at the hospital and your wound can be reconstructed and repaired.

How is Mohs Surgery different to standard surgery?

The main difference between Mohs surgery and standard (conventional) surgery is that the histology results are available whilst you are still at the hospital, and any remaining tumour can be completely removed in most cases. Also, Mohs surgery aims to preserve as much normal skin and tissue as possible. Lastly, Mohs surgery has the highest cure rate (up to 99%) and lowest recurrence rate for tumour removal compared to conventional excision (around 90%). It is classed as the 'gold-standard' treatment for removal of BCCs and some other skin cancers.

Who performs Mohs Surgery?

Mohs surgery can only be performed by a surgeon who has undertaken additional specialist training in Mohs Micrographic Surgery. In our Trust, Mohs surgery is performed by members of our Plastic Surgery team. As such, we aim to perform your complete tumour resection and final reconstruction within the same sitting. We are one of only a few Plastic Surgery-led Mohs services in the UK. We have a dedicated specialist team who will work together on the day of your surgery to ensure you receive the best possible care.

The Lancashire Plastic Surgery Mohs Team

- Consultant Plastic & Reconstructive Mohs Surgeon
- Consultant Histopathologist
- Senior Biomedical Scientist
- Senior Theatre staff
- Ward and recovery staff
- Dressing clinic nurses
- Skin Cancer Specialist Nurses

What are the benefits of Mohs Surgery?

- It is associated with the highest tumour clearance rates, and lowest recurrence rates
- It preserves surrounding normal tissue which otherwise may be removed with conventional surgery
- It permits 'real-time' histology analysis, so tumour clearance can be confirmed on the day of surgery
- It allows reconstruction to be performed in the same hospital visit with confidence that no tumour remains

What are the disadvantages of Mohs Surgery?

- It is time-consuming and can take all day
- It involves multiple trips to theatre in the same day
- It is highly specialised and in high demand, as such the waiting list for surgery can be lengthy
- Even with Mohs techniques, there are some cases where tumour clearance cannot be achieved

Are there alternatives available?

Yes. Most skin cancers can be treated 'conventionally' with standard excision techniques. This involves a similar process, but the histology results are not available until several weeks after surgery.

Where do I go on the day of surgery?

On the day of surgery you will be admitted to Rawcliffe Ward at Chorley District Hospital. Here you will be greeted by the reception and nursing

staff. You will be asked a series of routine questions, have some standard observations taken, for example blood pressure, oxygen levels and temperature, and then be shown to a comfortable chair / bed space.
You will be seen by the Mohs Plastic Surgeon who will confirm the site of your surgery and discuss the procedure with you in some detail. It is common for the surgeon to present you with a range of possible outcomes from the surgery, including the reconstructions which may be needed. This is because the size of the wound needing repair can be unpredictable in some cases. The surgeon will ask you to sign a consent form for the surgical procedure, and also for the use of photography to form part of your medical record.

What does the Mohs surgery process involve?

Once it is time for your procedure, you will be escorted to the Mohs theatre. Mohs surgery is nearly always performed under local anaesthetic and is carried out in stages.

The first stage removes the visible tumour and a very thin border of tissue. This specimen is taken by the surgeon to our bespoke Mohs Lab next door to the theatre where it is processed.

Your wound will be dressed and you will await your results in our waiting area near the theatre. During this time it is helpful to have a snack and something to drink. The processing time will vary depending on the size of the tumour and the number of patients undergoing Mohs surgery on that day. As a rough guide, we would expect processing time to be around 1 to 1½ hours.

Whilst you are waiting, the team is working hard to process your tissue specimen. Your tumour is frozen into a ‘block’, sliced very thinly, and stained with special dyes. These slices are then placed onto glass

slides and examined under the microscope for cancer cells. The surgeon and pathologist complete a ‘map’ of your tumour to ensure only the area with remaining cancer is subjected to further surgery.

Once the results are available, the Mohs surgeon will discuss this with you and explain whether further tumour requires removal, or whether your wound can be repaired. If there is tumour present, the process starts again until there is no further tumour remaining. As such, you may return to theatre several times in the day.

It is important for you to know that very rarely we are unable to remove all the tumour present, even with Mohs surgery. This is usually because it is very deep or involving too many important structures. In this situation, we would discuss the management plan with you, which may involve further surgery on a different day, or an alternative treatment.

Once the tumour is fully removed, what happens next?

You will return to the theatre for the last time during the day and your wound will be repaired. This repair will depend on the size and complexity of the wound that is left.

Some wounds can be repaired with simple stitches, or even left to heal by themselves with dressings. Many wounds require reconstruction with a skin graft (a patch of skin from somewhere else on your body) or skin flap (nearby skin along with its blood supply) to cover the wound. Sometimes a combination of techniques is used.

Occasionally your wound will require a ‘staged’ reconstruction, which means it must be performed in two or more phases. If this is the case, your first stage will be performed on the day of your Mohs surgery, and the second stage a few weeks later.

Once you have had your reconstruction you will return to Rawcliffe Ward and be discharged home.

Will anything else happen?

Photographs of your skin lesion are taken at the beginning of the procedure. Further images are often taken at each stage and again at the end, after repair. These photographs are kept securely on the hospital's medical illustration system as part of your medical documentation and are used for audit and teaching purposes. Should the team wish to use your images for any other purpose, such as publication, separate permission will be requested from you.

How long does this all take?

Mohs surgery requires a minimum of 2 procedures carried out in the same day, however, most patients will require 3 or more. The length of time in the hospital will depend on the size of the tumour, the number of stages, and the complexity of the reconstruction. As such, it is best to plan to be at the hospital for the *whole day*. We would recommend bringing some reading material and snacks / drinks.

What are the potential complications?

Most operations are straightforward. However, as with any surgical procedure, there is a small chance of complications. This list of complications is not intended to put you off having the operation, but you need to be aware of any potential risks before you consent to having surgery. If you have questions or concerns, please discuss these with a member of the surgical team.

Bleeding. Most wounds have a small amount of blood present which can seep from the wound in the first few hours after surgery. This normally resolves by itself and simply requires mild pressure and a padded dressing. There is small a risk that you could experience

bleeding from the site of the operation which may result in a collection of blood beneath the stitch line, called a haematoma. Occasionally you may need another operation to remove this. Symptoms of excessive bleeding include pain and swelling around your wound.

Infection. There is a risk of wound infection, which can occur at any time following surgery. If your wound becomes infected, you may need treatment with antibiotics. After a wound infection, healing may be delayed, and you may need dressings for a longer period than normal.

Scarring. You will have a permanent visible scar on your skin at the site of the Mohs surgery. There will also be a scar at the site of any donor site used for reconstruction, if needed. Scars tend to improve over time, up to 18 months following surgery. In some patients, for genetic reasons, scars can become raised, red and lumpy; unfortunately, this is largely beyond surgical control. The way a scar develops depends as much on how your body heals as it does on your surgeon's skills.

Pain. This procedure is not associated with significant pain. We provide local anaesthetic to the surgical site and keep this 'topped-up' for you during the day. The local anaesthetic injection can sting, but we try to minimise this with specialist equipment and technique. Some mild pain is expected and is usually easily managed with simple painkillers.

Wound breakdown. There is a risk that your wound may break down following surgery. If this happens you will require dressings for a longer time than usual, or you may need further surgery.

Recurrence. Tumour recurrence after Mohs surgery is uncommon and is lower than standard surgery. However, this does occur in less than 1% of cases.

Unpredictable defect. Some tumours are easy to see with the naked eye, but others are not. As such, Mohs surgery can detect and remove tumour that is not visible clinically. This can sometimes lead to a defect (wound) that is bigger or more extensive than expected.

Altered sensation / weakness. A degree of altered skin sensation in the region of any surgery is common, and this is not specific to Mohs surgery. Scars can become numb, or sometimes 'extra' sensitive. If the tumour removed is close-to, or involving, a nerve, then the skin or muscles it supplies will be affected. This can produce a patch of numbness, or some weakness of local muscles. Your surgeon will discuss this with you if this is likely in your case.

Unable to clear tumour. This is a very uncommon scenario in Mohs surgery. This occurs mainly when tumour is close to vital structures such as bone, blood vessels, or major nerves.

Contour defect / asymmetry. Whilst every effort is made to ensure a good cosmetic result following reconstruction, it is fairly common that there will be a degree of asymmetry or contour difference. This can be due to redistribution of tension in the tissues; excess or paucity of tissue; differences in colour or thickness of skin grafts / flaps, or a combination of these. In most cases results improve over time once scars have fully matured, with the final result sometimes taking over a year from surgery to become apparent.

Complications around the eyelid. Surgery around the eyelid can lead to some specific issues. These include watery eyes, dry eyes, pulling of the eyelid, difficulty fully closing the eyes, abnormal eyelash growth. If your surgery is around the eyelid, your surgeon will discuss these with you in more detail.

Staged surgery / revision procedure. Some wounds require more than one operation to complete the full reconstruction. This is usually known in advance and will be discussed with you. Occasionally a revision procedure may be needed at a later date to help improve scarring or contour.

Anaesthetic risks. The vast majority of Mohs surgery is completed with local anaesthetic injections. As such the risk of anaesthetic complication is low. If you require many Mohs stages, you may approach the maximum permitted dose of local anaesthetic, and if this happens, we

are usually able to offer an alternative. Some operations are performed under general anaesthesia, and if this is the case, the anaesthetist will discuss this with you.

What happens after the surgery?

As most of our Mohs surgery is performed under local anaesthetic, you are usually able to go home soon after your procedure has finished. Follow-up appointments for wound review and outpatients clinic will be arranged for you at the time of discharge from hospital.

If a general anaesthetic or sedation is required, your surgeon will discuss this with you in advance, and you may be required to stay in hospital overnight.

What are the next steps?

Your aftercare will depend upon the reconstruction used in your surgery. Simple wounds can often be managed individually by patients or in the community by GP practice nurses or local walk-in centres.

Skin graft or local flap reconstructions often need review by our specialist team of dressings clinic nurses, around a week post-surgery. Some of the more complex reconstructions may require an early review by the surgeon and then dressing clinic follow-up afterwards. This information will be given to you before you leave hospital, so you know exactly what your individual treatment plan involves. You will normally have an outpatient appointment arranged to see the surgeon or specialist nurse 2-3 months after surgery.

Contact details

If you have any questions or concerns at any time, please contact your skin cancer nurse specialist on 01772 522062 or 07525387668. A voicemail service is available for non-urgent messages and the specialist nurse will aim to return your call within one working day. You can also email skincancerCNSteam@lthtr.nhs.uk

Please note that this is not an emergency service and does not operate out of office hours. You should contact your GP or the Plastic Surgery department if you require assistance out of hours.

Sources of further information

www.lancsteachinghospitals.nhs.uk
www.nhs.uk
www.accessable.co.uk
www.patient.co.uk

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www.lancsteachinghospitals.nhs.uk/patient-information-leaflets

Lancashire Teaching Hospitals is a smoke-free site. Smoking is not permitted anywhere on any of our premises, either inside or outside the buildings. Our staff will ask you about your smoking status when you come to hospital and will offer you support and advice about stopping smoking this will include Nicotine Replacement Therapy to help manage

your symptoms of withdrawal and the opportunity to speak to a nurse or advisor from the specialist Tobacco and Alcohol Care Team.

If you want to stop smoking, you can also contact Smokefree Lancashire on Freephone **08081962638**

Please ask a member of staff if you would like help in understanding this information.
This information can be made available in large print, audio, Braille and in other languages.

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