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# Patient's Guide to Mohs Micrographic Surgery

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## **INTRODUCTION**

Mohs micrographic surgery is a specialized procedure for the removal of skin cancer. It is named after the originator of the technique, Dr. Frederick Mohs. This booklet was written to help you understand what Mohs micrographic surgery is and why it is recommended for the treatment of skin cancer.

Dr. Zain Husain is board certified dermatologist by the American Board of Dermatology and a Fellow of the American College of Mohs Micrographic Surgery and Cutaneous Oncology. He is one of a very small number of specially trained dermatologists who perform this type of surgery in this region.

Patients who undergo this procedure do so in relative comfort and do not require a hospital visit. We encourage patients to be as informed as possible about the surgical procedure they are considering. If you have any additional questions after reading this booklet, please call our office at 732-702-1212.

## **WHAT IS SKIN CANCER?**

Skin cancer, by far the most common malignant tumor in humans, is an abnormal growth of cells that expand in an unpredictable pattern on the skin. The most common types of skin cancer are basal cell carcinoma, squamous cell carcinoma and malignant melanoma – each named for the particular skin cell from which it arises. Basal cell and squamous cell carcinomas are commonly treated by Mohs micrographic surgery in our office.

Both basal cell carcinoma and squamous cell carcinoma begin as a single point in the upper layers of the skin and slowly enlarge, spreading along the surface and downward. These extensions cannot always be directly seen. The tumor often extends far beneath the surface of the skin. If not completely removed, both types of skin cancer may invade and destroy structures in their path.

Although these skin cancers are locally destructive, they do not tend to metastasize (spread) to distant parts of the body. Metastasis is extremely rare in basal cell carcinoma and usually occurs only with long-standing, large tumors. Squamous cell carcinoma is slightly more dangerous, and patients must be observed for any spread of the tumor.

## **WHAT CAUSES SKIN CANCER?**

Excessive exposure to sunlight is the single most important factor associated with the development of skin cancer. In addition, the tendency to develop these cancers appears hereditary in certain ethnic groups, especially those with fair complexions and poor tanning abilities. Fair-skinned people develop skin cancers more frequently than dark-skinned people and the more sun exposure they receive, the more likely they are to develop a skin cancer.

#### HOW IS SKIN CANCER TREATED?

There are several methods for treatment including excision (surgical removal), curettage and electrodesiccation (scraping and burning), X-ray therapy, cryosurgery (freezing), topical chemotherapy and Mohs micrographic surgery. The method chosen depends on the location of the cancer, its size, type and previous treatment. Your doctor will base his/her recommendations on these factors.

#### WHAT IS MOHS SURGERY?

Approximately 40 years ago, Dr. Frederick Mohs of Madison, Wisconsin, developed a unique form of treatment for skin cancer called chemosurgery. Dr. Mohs applied a caustic chemical to “fix” (harden) the area involving the tumor so that it could be removed and traced to all of its edges. Since then, the procedure has been refined. Today, almost all cases are treated by the “fresh tissue” technique which omits the use of this caustic chemical and allows dermatologists to remove all of the tumor layers in one day. Mohs micrographic surgery is a technique that allows dermatologic surgeons to selectively remove areas involved with the skin cancer, while at the same time preserving the greatest amount of normal tissue as is possible. If surgical repair of the defect is necessary, it can be done with the knowledge that the chance of recurrence of the cancer has been minimized. A Mohs surgeon is a person who is highly qualified in removing the skin cancer surgically, in analyzing the tissue microscopically, and in reconstructing the defect.

#### HOW SHOULD I PREPARE FOR SURGERY?

Eat your usual breakfast. If you normally skip breakfast, please have a morning snack on the day of surgery. You are more than welcome to bring plenty of additional snacks or lunch as you may become hungry throughout the morning. The procedure could last between 3–6 hours or even longer if the skin cancer is extensive. It is also a good idea to bring something to read or do. The majority of the time during the procedure is spent waiting for the removed tissue to be processed so you will have ample free time.

**Take ALL of your regular medications unless directed otherwise by your surgeon or your regular physician.** This includes blood thinners such as coumadin (warfarin), plavix and aspirin. This also includes blood pressure medications. A common mistake is to forgo taking one’s blood pressure medication. This can result in high blood pressure at the time of surgery which will us force us to postpone or cancel your surgery.

If you take a baby aspirin everyday as a prophylaxis for blood clots, stroke or heart attacks **but have never had a blood clot, stroke or heart attack, please stop it 3-4 days before surgery.**

Wear comfortable, loose-fitting clothing that will allow the doctors easy access to the site being treated. Avoid any pull-over clothing. If necessary, we may give you a hospital gown to wear during your surgery. You may also want to bring a sweater because we keep our rooms cool to maintain special equipment.

**Please leave your whole day available for surgery. Surgery time may take up to six to eight hours.** This includes the time that is necessary to properly administer local anesthesia, for our laboratory to process your tissue (1-2 hours for each Mohs layer), reconstruction of the skin and bandaging afterwards. On the day of surgery, we encourage you to bring a friend or relative with you to keep you company between each stage of the procedure. If the surgery is near the eye, we would like someone present to drive you home. Lastly, please inform us in advance if you have an implantable cardiac defibrillator (ICD). The presence of an ICD will not preclude us from doing Mohs surgery; however, we will need to use an alternative form of electro-surgery that does not interfere with the ICD when managing any bleeding.

#### **WILL I NEED ANTIBIOTICS PRIOR TO MY SURGERY?**

Depending on your health history, you may require a dose of an antibiotic 30-60 minutes prior to your surgery. This is called antibiotic prophylaxis. Antibiotic prophylaxis is used in patients with heart valve disease and related conditions to reduce the risk of bacterial heart valve infection following minor surgery. Antibiotic prophylaxis is also used in certain patients with prosthetic joints (i.e. hip or knee replacement) to reduce the risk of bacterial prosthetic joint infection following minor surgery. If you have any of the conditions below, you may require antibiotics prior to your surgery:

- Prosthetic cardiac valve
- History of previous endocarditis
- Heart transplant recipients with valvulopathy
- Congenital heart disease
- Prosthetic joint placed within the last two years
- History of previous prosthetic joint infection
- History of previous prosthetic joint infection and an immunocompromising condition such as HIV/AIDs, type 1 diabetes mellitus
- History of previous prosthetic joint infection and currently taking immunocompromising medications (i.e. prednisone, methotrexate, etc)

Please let us know if you have any of the above conditions and of any antibiotic medication allergies so we can prepare for you to have the appropriate medicine prior to your surgery.

#### **HOW IS THE SURGERY PERFORMED?**

Mohs micrographic surgery is performed in a procedure room under sterile conditions with local anesthesia. Once anesthesia is complete, the visible portion of the tumor is removed by excision or

scraping with a circular instrument called a curette. Following the removal of most of the tumor, a thin layer, encompassing the complete undersurface of the tumor, is excised. That layer is then cut into small pieces and a map is drawn to identify the location of each piece. The edges of each piece are marked with dyes to aid in orientation on our map. Each piece is then frozen and then cut, stained and examined under the microscope. Any areas in which the tumor is found are marked on the map. Regions with remaining tumor tissue are then re-excised. This procedure is repeated until no more tumor is found and the cancer is entirely removed. After each layer of tissue is obtained, bleeding vessels are cauterized or ligated with a suture. A pressure dressing is applied.

#### **HOW LONG DOES IT TAKE?**

It takes five to ten minutes to remove each layer of tissue and one to two hours to process and examine it. Once the layer has been taken and you have been bandaged, you are free to wait in the procedure room or waiting room while we process the tissue. During this time, you are free to do what you like (i.e. read, eat, converse with a friend, etc.); however, we ask that you remain in the office.

Most tumors require the removal of one or two layers, but depending on the extent of the tumor, it is not uncommon to need three or more layers. **It is not possible to tell how many layers will be needed by merely looking at the site on the skin prior to or during the surgery.** The only way to assess the extent of the tumor is through microscopic analysis. Extensive tumors may need more surgery and may require a second visit, but this is a rare occurrence.

On average, most patients will spend between 3-6 hours at the office for the entire procedure.

#### **WILL MOHS MICROGRAPHIC SURGERY CURE ME?**

If you have a basal cell carcinoma, there is about a 99% chance that you will be cured if the site has never been treated. If you have a squamous cell skin cancer, you can be about 95% certain you will be cured if the site has never been treated. However, follow-up visits to detect the rare recurrence are very important.

#### **WHEN WILL MY POST-SURGICAL PLAN BE DEVELOPED?**

Since it is not possible to know the exact size of each wound until it has been completely removed, we cannot determine your postsurgical treatment in advance, although we can tell you what to expect. Many wounds are superficial and can heal on their own with excellent cosmetic results. However, this type of healing can take a few weeks to a few months.

**It is also very important to understand that the wound following Mohs surgery will undoubtedly be larger and deeper than the wound from the original biopsy.** The primary goal of the procedure is to

fully remove all the skin cancer, including its roots. The secondary goal is to remove as little surrounding normal tissue as possible with the hope of keeping the ultimate defect small.

If a wound requires reconstruction, we will discuss it with you following the complete removal of the cancer. Many wounds can be reconstructed right after Mohs surgery whereas with other wounds (especially deeper ones), it is more advantageous to wait 1-2 weeks to allow the base of the wound to partially fill in, prior to proceeding with reconstruction. Again, Dr. Husain is trained not only in Mohs surgery and pathology, but also in reconstruction of defects.

In a small number of select cases, the ultimate wound may be very large or too close to a vital structure such as the eyelid. In these instances, we may coordinate the reconstruction with a specialist such as an Oculoplastic surgeon or Facial plastic surgeon.

#### **WHAT CAN I EXPECT AFTER SURGERY?**

Your surgical wound will likely require wound care following surgery. Immediately after surgery, a large bulky pressure bandage will be placed on the surgical site to keep pressure on the area so that bleeding and bruising are minimized. This bandage may be on for one to two days after. You will have some swelling and redness around the wound. **This is very common and almost always not a concern for infection.** This will gradually disappear over seven to ten days. In larger wounds, some drainage may occur and may have a foul odor for a few days. You should plan on wearing a bandage and avoid strenuous physical activity for one to two weeks following your surgery.

You may experience a sensation of tightness across the area of surgery. Skin cancers frequently involve nerves and months may pass before your skin sensation returns to normal. In some cases, numbness may be permanent. You may also experience itching after your wound has healed. **Complete healing of the surgical scar takes place over twelve to eighteen months.** Especially during the first few months, the site may feel swollen or lumpy and there may be some redness. Gentle massage of the area (starting about one month after surgery) and keeping the area lubricated with Vaseline will speed the healing process.

#### ***BLEEDING***

It is very important to differentiate bleeding from dried blood on the bandage. There will almost always be a small amount of dried blood on the bandage as drainage of blood from the wound or incision line is normal. **Dried blood on the bandage is normal and expected.**

Bleeding is defined as active oozing of blood from the wound or incision line. Bleeding is rare, but if it occurs, apply constant, firm pressure to the site of oozing for 20 minutes. You will receive written instructions regarding after care of the surgical site. If a bulky dressing has been placed on the wound, this should not be removed. Direct pressure should be applied to the padded wound for 20 minutes,

timed by looking at a clock. **Do not** discontinue pressure to see if the bleeding has stopped until 20 minutes have elapsed. If the bleeding continues, continue to press directly with an additional clean gauze pad over the site for another 20 minutes. If bleeding continues, call our office or go to your local ER while maintaining pressure to the area.

#### **PAIN**

Mild to moderate pain is normal for a day or two following surgery, but it generally responds well to over-the-counter pain medications such as Extra Strength Tylenol. Do not use aspirin or anti-arthritis pain medications such as Motrin, Advil or ibuprofen because they can increase your chance of bleeding. If regular pain medications provide insufficient relief, please contact our office. A stronger pain medication can be called into your pharmacy for you to pick up.

#### **HOW WILL MY WOUND HEAL?**

The human body healed itself naturally for thousands of years before the advent of modern medicine and it has great recuperative ability. After the complete removal of the tumor, several options may be considered for managing the wound. Some of them are:

##### **HEALING BY SPONTANEOUS GRANULATION**

Letting the wound heal by itself offers a good chance to observe the healing process and decreases the chance of a recurrent cancer being invisible or hidden. **If at any time during the course of healing, the scar is deemed to be unacceptable, a delayed reconstruction can be performed.** Allowing wounds to heal this way is relatively painless and offers excellent cosmetic results for many body locations.

##### **CLOSING THE WOUND OR PART OF THE WOUND WITH STITCHES**

This often speeds healing and can offer good cosmetic results, especially when the scar can be hidden in a line of facial expression or wrinkling. Sutures generally remain in place for seven days and occasionally up to two weeks, depending on the location. Keep the area dry for the first 24-48 hours. Swimming pools, hot tubs and swimming in the ocean is not recommended when the skin is open.

##### **CLOSING THE WOUND WITH SKIN GRAFTS, FLAP REPAIRS OR OTHER RECONSTRUCTIVE PROCEDURES**

In certain situations, some wounds require more complex reconstruction such as skin grafts (taking skin from another place on the body to repair a defect), flaps (moving adjacent tissue to

Cover wounds) or other reconstructive procedures. Dr. Husain is highly trained in these reconstruction techniques and will readily utilize them if indicated.

#### **CAN I EXAMINE MYSELF FOR OTHER SKIN CANCERS?**

Skin cancers can vary in appearance. Regularly checking your skin can alert you to the development of a cancerous condition. Look for:

Any spot that continues to itch, hurt, crust, scab, erode or bleed.

Any open sore or wound on the skin that does not heal, lasts for more than one month or heals and then reopens on a regular or irregular basis.

Skin growths that change in size, color, texture or outline.

**If you have any of these symptoms, you should make an appointment for a check-up soon with Dr. Husain.**

#### **CAN I PREVENT MYSELF FROM GETTING SKIN CANCER AGAIN?**

Protection from sunlight is very important in preventing skin cancers as well as many of the cosmetic changes of aging. Apply sunscreen every day. Many moisturizers have an SPF of 15. When outside, a stronger sunscreen with at least an SPF of 50 or greater is recommended as well as frequent reapplication when needed. Don't forget that the best sun protection is staying in the shade or wearing protective clothing. There is no such thing as a healthy tan. The skin makes pigment to protect itself from the damaging rays of the sun. Think of a tan as a measure of damage in your skin. Sunbathing is prohibited. **Suntan parlors are absolutely prohibited.**

#### **IMPORTANT REMINDERS:**

Do advise us as soon as possible if you must cancel or change your appointment. The incidence of skin cancer has risen along with the aging population. If you can't keep your appointment, someone else's cancer can be cured.

Do get a good night's sleep prior to surgery.

**Do take your usual medications on schedule unless otherwise directed by your doctor. That includes blood thinners prescribed to treat previous strokes, heart attacks or blood clots, blood pressure medications, and other prescribed medications.**

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Do take any new medications your Mohs surgeon prescribes for you.

Do inform us of any pre-existing medical conditions that may require you to take antibiotics prior to your surgery.

Do inform us of any medication allergies.

Do inform us if you have an implantable cardiac defibrillator.

Do eat breakfast and bring plenty of snacks/lunch.

Do consider bringing someone with you to accompany you during surgery.

You must bring someone to drive you home if the surgery is near the eye.

Do ask any questions you might have.

Do not consume alcohol for 5 days prior to or 48 hours after surgery as this may increase bleeding during or after surgery.