

DERMATOLOGY

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MOHS MICROGRAPHIC SURGERY: AN OVERVIEW

SKIN CANCER:

Skin cancer is far and away the most common malignant tumor found in humans. The most frequent types of skin cancer are basal cell carcinoma, squamous cell carcinoma, and melanoma. Both basal cell carcinoma and squamous cell carcinoma begin as a single point in the upper layers of the skin and slowly enlarge, spreading both along the surface and downward. These extensions cannot always be directly seen as the tumor(s) often extends far beyond what is visibly seen on the surface of the skin. If not completely removed both of these 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 of basal cell carcinoma is extremely rare and usually occurs only in the setting of the long-standing large tumors where the patient's immune system is compromised. Squamous cell carcinoma is slightly more dangerous and patients must be observed for any advanced spreading of the tumor. Such spreading is infrequent. Melanoma is a very different and more dangerous kind of skin cancer and is only occasionally treated with Mohs Micrographic Surgery.

Excessive exposure to sunlight is the single most important factor associated with the development of skin cancers. In addition, the tendency to develop these cancers appears to be 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. Other factors, including exposure to radiation, trauma, and exposure to certain chemicals may also be involved in the development of skin cancers. The vast majority of skin cancers are present for more than a year before being diagnosed and their growth is rather slow.

Skin cancers may be more aggressive in certain instances:

- Patients whose immune system is compromised.
- Patients with medical history of leukemia or lymphoma.
- Cancers in certain locations such as the ear, lips, lower nose, or around the eyes.

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There are five standard methods for the treatment of skin cancers. The two non-surgical treatments are cryotherapy (deep freezing), and radiation therapy. The three surgical methods include excision with or without an immediate frozen section check of the edges, physical destruction (curettage with electrodesiccation), and Mohs Micrographic surgery. Newer methods under investigation include photodynamic therapy and immunochemotherapy.

In the past, Mohs Microscopic Surgery was occasionally called chemosurgery or Mohs chemosurgery. Originally, chemicals were applied to the skin during the surgery, hence the name chemosurgery. Chemicals are rarely used today, but the name chemosurgery continues to be associated with the procedure.

After the removal of the visible portion of the tumor by curettage (debulking), there are two basic steps to each Mohs Microscopic Surgery stage:

1. A thin layer of tissue is surgically excised from the base of the site. This layer is generally 1-2 mm larger than the clinical tumor. Next, this tissue is processed in a unique manner and examined underneath a microscope. On the microscope slide, the surgeon examines the entire bottom surface and outside edges of the tissue (this differs from the “frozen sections” prepared in a hospital setting, which in fact, represent only a tiny sampling of the tumor margins). This tissue has been marked to orient top to bottom and left to right.
2. If any tumor is seen during the microscopic examination, its location is established and a thin layer of additional tissue is excised from the involved area. The microscopic examination is then repeated. The entire process is repeated until it is tumor free.

Mohs Micrographic Surgery allows for the selective removal of the skin cancer with the preservation of as much of the surrounding normal tissue as possible. Because of this complete systemic microscopic search for the “roots” of the skin cancer, Mohs Micrographic surgery offers the highest chance for complete removal of the cancer, while sparing the normal, healthy tissue.

The cure rate for new skin cancers exceeds 97%.

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As a result, Mohs Micrographic Surgery is very useful for:

- Large tumor(s).
- Tumors with indistinct borders.
- Tumors near vital functional or cosmetic structures.
- Tumors for which other forms of therapy have failed.

No surgeon or technique can guarantee 100% chance of cure.

PREOPERATIVE VISIT:

We require the opportunity for a preoperative consultation. During this visit a complete medical history is taken along with photos, and the procedure is fully explained. If either party has questions or concerns, this is a great time for open discussion.

BEFORE MOHS MICROSCOPIC SURGERY:

Be well rested and eat a good breakfast. Take your usual medications, unless directed otherwise. Do not drink any alcoholic beverages for 48 hours before surgery.

Shampoo your hair before surgery, as your wound and initial dressing may have to remain dry for at least 24 hours thereafter. The length of the procedure varies depending on the size and location of the skin cancer and the type of reconstruction to be done (though the average length of time is 1½ - 3 hours). You should plan on spending much of the day in our office. We ask that you limit the number of people accompanying you to one because of the limited space in our waiting room.

DAY OF SURGERY:

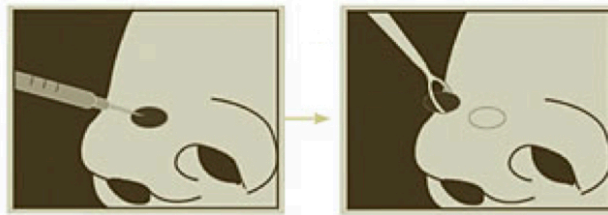
Appointments for surgery are scheduled throughout the day. It is a good idea to wear loose fitting clothing. Also, if the operative site is on the face, please do not wear makeup on or around the area. We will obtain your written consent for the procedure, and photographs will be taken. If you have any additional questions, please feel free to ask us at this time.

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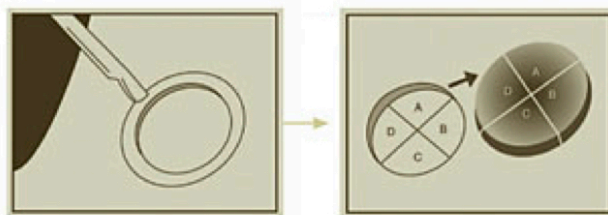
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The areas surrounding the skin cancer will be cleansed with an anti bacterial liquid. The doctor will then anesthetize (numb) the area of skin containing the cancer by a small local injection. This injection will probably be similar to the one you received for your biopsy. We will be as gentle as possible when administering this injection. Generally, it takes 15 minutes to anesthetize the involved area and remove the tissue. After the tissue has been removed, it will be processed in our office laboratory.

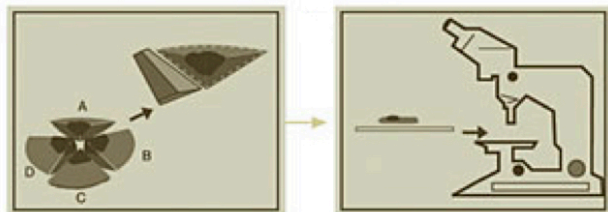
Depending upon the amount of tissue that is removed, processing usually takes an additional 30 minutes (minimum). Your wound will be bandaged; the tissue is processed for examination, stained, and examined by the surgeon. If the microscopic examination of the removed tissue reveals the presence of additional tumor(s), we will go back and remove more tissue. The Mohs technique allows us to precisely map out where the roots of the cancer remain. Most skin cancers are removed in 1-3 surgical stages, or one day.



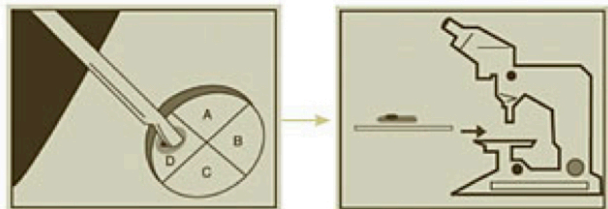
*An injection numbs the area.
The visible portion of the tumor is debulked.*



A thin layer of tissue is excised from the surrounding skin and base. The removed tissue is mapped and sectioned.



The deep and peripheral margins of each section are thinly sliced with a microtome and mounted on microscope slides for examination.



If additional tumor is found, it is located on the map, marked, and a subsequent layer is removed. The examination/removal process continues until no tumor is found.

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RECONSTRUCTION:

After the skin cancer has been completely removed, a decision is made on the best method for treating the wound created by the surgery. These methods include letting the wound heal by itself, closing the wound in a side-to-side fashion with stitches, closing the wound with a skin graft or a flap. In most cases, the best method is determined on an individual basis after the final defect is known. Most of the wound closures are performed in our office, however other surgical specialists may be utilized for their unique skills if a tumor turns out to be much larger than initially anticipated. We individualize your treatment to achieve the best results possible. If the surgeon feels another specialist is needed, you would be made aware of this at your original consult appointment.

When the reconstruction surgery is to be completed by another surgical specialist, it may take place on the same day, or on a subsequent date. There is no harm in delaying the reconstruction for several days. If the reconstruction is to be extensive, that portion of the operation may require hospitalization. This is the exception rather than the rule, as most wounds are repaired immediately in our office while the site is still anesthetized.

AFTER MOHS MICROGRAPHIC SURGERY:

Your surgical wound will likely require care during the weeks following surgery. Detailed written instructions will be provided. You should plan on wearing a bandage, and avoiding strenuous physical activity for at least a week. Most of our patients report minimal pain, which responds readily to Tylenol. You may experience a sensation of tightness across the area of the surgery, which is normal. Skin cancers frequently involve nerves and months may pass before your skin sensation returns to normal. In rare instances, the numbness may be permanent. You may also experience itching after your wound has healed – complete healing of the surgical scar takes place over the span of 12-18 months. During the first few months, the site may feel “thick,” swollen, or lumpy, and there may be some redness. Gentle massage of the area (starting 1 month after the surgery) may speed up the healing process.

An indefinite follow-up period of observation is necessary after the wound has healed. You will be asked to return in six months to one year following the procedure. Studies have also shown that once you develop a skin cancer, there is a

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strong possibility of developing other skin cancers in the future. Should you notice any suspicious areas, it is best to check with your provider for a complete evaluation. You will be reminded to return to your dermatologist on a frequent basis for continued surveillance of your skin.

RISKS OF MOHS MICROGRAPHIC SURGERY:

Because each patient is unique, it is impossible to discuss all the possible complications and risks in this format. The usual risks are discussed below. The surgeon will discuss any additional problems associated with your particular case. Please understand that these occurrences are the exception and not the rule.

- The defect created by the removal of the skin cancer may be larger than anticipated. There is no way to predict prior to surgery the exact size of the final defect.
- There will be a scar at the site of the removal. We will make every effort to obtain optimal cosmetic results, but our primary goal is to remove the entire tumor. Again, Mohs surgery will leave you with the smallest wound, thus creating the best opportunity for optimal cosmetic results.
- There may be poor wound healing. At times, despite our best efforts, for various reasons (such as bleeding, poor physical condition, smoking, diabetes, or other diseases), healing is slow or the wound may reopen, flaps and grafts utilized to repair the defect may, at times, fail. Under these circumstances, the wound will usually be left to heal on its own.
- There may be a loss of motor (muscle) or sensory (feeling) nerve function. Rarely, the tumor invades nerve fibers. When this is the case, the nerves must be removed along with the tumor. Prior to your surgery, the doctor will discuss with you any major nerves, which might be near your tumor.
- The tumor may involve an important structure. Many are near, or on vital structures such as the eyelids, nose, or lips. If the tumor involves these structures, portions of them may have to be removed with resulting cosmetic or functional deformities. Furthermore, repairing the resulting defect may involve some of these structures.
- Rarely, wounds become infected (fewer than 1%) and require antibiotic treatment. If you are at particular risk for infection, you may be given an

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antibiotic prior to surgery.

- There may be excessive bleeding from the wound. Such bleeding can usually be controlled during surgery. We have never had a significant amount of blood loss, but bleeding into a sutured graft or flap, may inhibit good wound healing.
- There may be an adverse reaction to medications used. We will carefully screen you for any history of problems with medications: however, new restrictions to medications may occur.
- There is a small chance that your tumor may regrow after surgery. Previously treated tumors and large longstanding tumors have the greatest chance for recurrence.

IMPORTANT REMINDERS:

DO advise us as soon as possible if you must cancel or change your appointment.

DO take your usual medications on schedule unless instructed otherwise.

DO eat breakfast, bring a small snack if needed.

DO dress comfortably.

DO ask any questions you might have.

DO let our staff know if you take antibiotics before dental work, Coumadin, or blood pressure medications.

DO NOT consume alcohol 48 hours prior to, or 48 hours after surgery.

DO discuss with the doctor when you may resume strenuous physical activity.

DO read the handouts you have been given regarding to the processes surrounding your procedure. We want you to be as comfortable as possible.

Should you have any questions or concerns, please call us at: 603-742-5556.