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Diplomate, American Board of Dermatology MOHS Micrographic Surgery

MOHS SURGERY PRE-OPERATIVE INSTRUCTIONS

You have been scheduled for Mohs surgery. A special period of time has been set aside for this procedure. If, for any reason, you need to reschedule your surgery, please let our office know at least 48 hours in advance so that other patients can be accommodated during this time.

We ask that you follow the instructions below in preparation for surgery:

1) Please be aware this procedure can take the **ENTIRE DAY** depending on the complexity of your surgery. It is OK to bring in something to keep you occupied during the wait.

2) You do NOT need to fast prior to surgery. We will provide snacks and coffee in the waiting room, it is OK to bring your own as well.

3) DO NOT arrive any earlier then your scheduled appointment.

4) You may eat breakfast on the day of surgery. There will also be coffee & snacks available in our office the day of your surgery.

5) It is **important** that the following medications be stopped **TWO WEEKS prior to surgery and TWO DAYS** following surgery: **Aspirin, Aspirin containing analgesics, Motrin, Advil, Ibuprofen, Aleve,** and any other medications used for headaches or arthritis. You may substitute any of the above pain reliever drugs with **Tylenol ONLY.**

6) It is **important** to also stop **all vitamins and Herbal supplements two weeks prior to surgery, Fish Oil, Vit D, etc** (see Herbal supplement list).

7) If you are taking blood thinners (i.e., **Coumadin, Plavix Warfarin, Persantine**), contact our office for special instructions.

8) Avoid all alcohol two days before and after surgery.

9) Avoid smoking, all tobacco products. (i.e., cigarettes, cigars, etc) for two weeks prior and after surgery

10) Please bathe or shower on the day of surgery, paying special attention to the surgical area. If surgery is planned for the scalp area, be sure to wash scalp vigorously. **Do not apply any lotions or sunscreens to the surgical area prior to coming into the office.**

11) Remove all makeup or moisturizers near the cancer site to eliminate any possible contamination and possible infection.

12) Avoid heavy exercise, all sporting or strenuous activities, including golfing and travel. Avoid movement or irritation of surgical site until sutures are removed the week following your surgery. The first two days after surgery you will need to plan to stay home and rest.

If you have any questions pertaining to the above instructions or other concerns, please contact our staff prior to the time of surgery. Thank you for your cooperation.

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Medications to avoid 14 days before surgery

Nonprescription medicines with aspirin

- 4-way cold tablets
- 8 hour Bayer time released aspirin
- Alka-Seltzer Antacid and pain reliever, flavored, effervescent, plain and extra strength
- Anacin Analgesic coated caplets, tablets, and extra strength
- Arthritis pain formula by the makers of Anacin analgesic tablets and caplets
- Arthritis pain formula by the makers of Anacin analgesic tablets and caplets
- Ascriptin tablets –A/D tablets and extra strength
- Bayer Children's chewable aspirin & cold tablets
- BC Powder & Arthritis strength BC powder
- Bufferin
- Cama Arthritis pain reliever
- Doan's PM
- Ecotrin tablets & maximum strength
- Empirin aspirin
- Excedrin extra strength analgesic tablet and caplets
- Genuine Bayer aspirin & maximum Bayer
- Measurin tablets
- Momentum muscular backache formula
- Midol maximum strength for cramps and original formula
- Mobigesic analgesic tablets
- Norwish aspirin & extra strength
- Pepto-Bismol liquid or tablets
- St Joseph aspirin for children
- Triamincin Tablets
- Ursinus Inlay tabs
- Vanquish

Ibuprofen Medicines

- Advil Ibuprofen caplets & tablets
- Aleve
- Haltran Tablets
- Medipren Ibuprofen caplets & tablets
- Nuprin Ibuprofen/Analgesic tablets
- Nyquil & Nyquil PM
- Trendar Ibuprofen tablets

Anticoagulants

- Calciparine injection
- Coumadin
- Heparin Lock flush solution in Tubex & Heparin sodium injection
- Heparin sodium injection USP sterile solution
- Mephytn tablets
- Plavix
- Protamine sulfate
- Ticlid

Antacids with Aspirin

- Alka-Seltzer Effervescent pain reliever & antacid, plain & flavored
- Alka seltzer plus cold medicine
- Axotal
- BAC Tablets
- Dia-gesic
- Fiogesic tablets
- Norgesic & Norgesic forte
- Supac
- Synalogos DC capsules

Anti-arthritics

- Anaprox
- Butazolidin capsules & tablets
- Clinoril tablets
- Ecotrin capsules & tablets
- Feldene capsules
- Indocin capsules, oral suspension & suppositories
- Indomethacin capsules
- Lodine
- Maximum Bayer aspirin
- Meclomen
- Medrol Tablets
- Motrin Tablets
- Nalfon puvules & tablets
- Naprosyn
- Prednisone
- Relafen
- Rufen tablets
- Tolectin tablets & DS capsules
- Toradol
- Voltaren
- Zorpin

Anti-gout medication

- Lopurin
- Zyloprim

Controlled analgesics with aspirin

- Ascriptin with codeine
- Darvon compound & Darvon compound 65
- Darvon with ASA & Darvon N with ASA
- Eguagesic
- Emperin with codeine
- Fiorinal & Fiorinal with codeine
- Micrainin
- Percodan & Percodan-demi
- Synalgos DC
- Talwin compound

Prescription Medicines with Aspirin

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Herbal supplements to avoid 2 weeks before surgery

All vitamin supplements
Ajoene
Birch barke
Black cohosh
Cayenne
Chinese black tree fungus
Cumin
Echinacea
Ephedra
Evening primrose oil
Feverfew
Fish oil
Garlic
Ginger
Ginko biloba
Ginseng
Grapseed extract
Melatonin
Milk thistle
Omega 3 Fatty acids
Onion extract
St Johns Wort
Tumeric
Vitamin C
Vitamin D
Vitamin E
Yohimbe

It is best to stop taking <u>ALL</u> vitamins, herbs and diet supplements 10-14 days before surgery and up to 7 days after surgery

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WHAT IS MOHS MICROGRAPHIC SURGERY?

By J.A. Carruthers, MD, FRCPC, and L.M. Warshawski, MD, FRCPC

MOHS MICROGRPHIC SURGERY IS A METHOD OF REMOVING SURFACE MALIGNANCIES. ITS SUCCESS DEPENDS ON THE FACT THAT MANY TUMORS WILL GROW IN CONTINUITY, EITHER MAINLY OR INITIALLY. BASAL CELL CARCINOMA IS THE COMMONEST TUMOR TO BE TREATED BY MOHS MICROGRAPHIC SURGERY, BUT THE LIST OF SUCH TUMORS IS GROWING AND NOW INCLUDES EXTRAMAMMARY PAGET'S DISEASE, DERMATOFIBROSARCOMA, PROTRUBERANS, AND ORPHARYNGEAL CARCINOMA.

Treatment by Mohs micrographic surgery will give a significantly higher cure rate than other modalities. E.g.: about 98% of all basal cell carcinomas are curable by this technique. Mohs micrographic surgery destroys all less normal tissue, allowing for better reconstruction and a superior ultimate cosmetic result.

History

Frederick Mohs is a general surgeon from Madison, Wisconsin, USA. As a student in the 1930's, he experimented within the vivo fixation of tissue on laboratory animals by using a fixative paste with a zinc chloride base. He extended the use of this paste for the treatment of epithelial neoplasm in patients in patients. After fixation, 24 hours, the abnormal tissue was removed bloodlessly and frozen sections were cut, stained, and reviewed; then more paste was applied to areas of residual tumor. Mohs' important modification of standard frozen tissue sectioning was to section the material horizontally rather than vertically so that the entire surgical margin is viewed. The modification improved cure rates significantly. A number of problems arose with the paste method, which he called "chemo surgery." Only one layer of tissue could be removed each 24 hours, and, during fixation, the patient experienced significant pain. Finally, since a thin layer of fixed tissue remained after chemosurgery, it was left to separate. The majority of defects healed spontaneously; plastic surgical repair was performed only if necessary. Although it produced cosmetically excellent results in the majority of patients, the slow healing process was a nuisance.

These three problems were circumvented by the introduction of the fresh tissue technique by Stegman and Tromovitch in 1969. In this technique, the zinc chloride paste was abandoned and fresh tissue was excised under local anesthesia. The majority of tumors could now be excised in a single day with much less pain. The wound was also suitable for immediate repair.

Ninety-nine percent of all Mohs micrographic surgery now uses the fresh tissue technique. Cure rates of Mohs micrographic surgery and the fixed tissue technique have been shown to be identical. The practicality and simplicity of the fresh tissue technique have produced an enormous expansion in the number of patients treated by Mohs micrographic surgery. In 1970, the American College of Chemosurgery had less than 20 members. In 1989, the American College of Mohs Micrographic Surgery and Cutaneous Oncology has about 200 members. To become a member of this organization, an individual must complete a one-year fellowship at a training program approved by the College. At present, five members of the college practice in Canada.

Technique

Simply put, Mohs micrographic surgery is excision with frozen section control; however, a number of changes in the normal technique significantly improve the cure rate. The procedure is done under local anesthesia in an outpatient surgical facility. The surgeon acts as pathologist.

After induction of local anesthesia, the tumor is debulked, usually with a curette. A thin layer of normal-appearing tissue is then removed from the sides and base of the defect. The sides are beveled, so that the tissue can be flattened, which places the sides and base of the defect on the same plane. The tissue is then divided into blocks of an appropriate size for sectioning. Frozen sections are cut horizontally off the base of the blocks, stained with hematology cosin or special stains such as toluidine blue for basal cell carcinoma, and then read by the Mohs surgeon. Areas of persistent tumor are marked on the map, which is then used to guide the surgeon in the removal of further tissue. The process is continued until a tumor-free plane is achieved throughout the defect.

The significant differences between this method and the standard frozen tissue technique include the horizontal sections, the proximity of the patient, surgeon, technician, cryostat, staining equipment, and microscope, and finally, the fact that the surgeon acts as the pathologist. The conversion of a three-dimensional tissue section into a two-dimensional frozen section is

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the most important difference since it allows the surgeon to visualize the entire surgical margin. It can be compared to the standard histopathological method of tissue sectioning, which is akin to selecting random slices from a loaf of bread. Horizontal sectioning, when combined with the mapping of defects, allows the surgeon to localize residual tumors accurately, even after multiple layers of tissue have been removed in extensive tumors. When a single person acts as both surgeon and pathologist, he or she can compare what appears under the microscope with what has been seen in the patient; this knowledge can guide the surgeon more accurately in subsequent tissue removal. When one individual performs or supervises the entire procedure, any "failure to communicate" is prevented and the individual's understanding of all parts of the procedure is increased. For example, the surgeon should be able to cut sections, stain them, and understand the functioning of the cryostat, as well as supervise the technician, and affect any emergency repairs.

Mohs micrographic surgery is time-consuming for patient, staff, and physician. Consequently, when compared with other office procedures, it is expensive, however, this technique is performed as an outpatient procedure in a non-hospital facility. The costs in such facilities are significantly less that those in larger institutions such as hospitals. When comparing the total cost to all budgeting levels, Mohs micrographic surgery does not differ greatly from excision and repair in a hospital operating room or radiation treatment in an institution.

INDICATIONS

Basal Cell Carcinoma

Basal cell carcinoma is a common tumor of exposed skin that grows in continuity and rarely metastasizes. It is ideal for treatment by Mohs micrographic surgery. Many early basal cell carcinomas can be satisfactorily treated by simpler methods, such as electrodessication and curettage or outpatient excision and closure with a cure rate of greater than 90%.

Primary Tumors

Essentially, Mohs surgery should be considered when a feature of the tumor suggests to the physician that the chance of cure is less than 90-95% with other therapies.

1. *Sites:* especially the nasofacial groove, nasolabial fold, inside the orbital rim, and the periauricular area
2. *Size:* particularly greater than 2.0 cm
3. *Histology:* infiltrating, spindling, sclerosing, morpheic, invasive
4. *Patients:* young, cosmetically concerned patients with a lesion in a sensitive area, such as the tip of the nose or above the alar rim

Recurrent Tumors

When a basal cell carcinoma is recurrent, it implies that the tumor was larger than was clinically obvious during the original treatment. The therapeutic choice is therefore between radiation of an extensive area and excision (blind, with standard frozen sections, or with Mohs micrographic surgery). In older patients, radiation may be preferable because of the lack of surgical trauma, although the inconvenience of five consecutive trips for therapy followed by a brisk, inflammatory response means this treatment is not as "easy" as patients sometimes imagine.
Radiation is most valuable in older patients with tumors of nose, eyelid, or ear, where extensive surgical repair can be avoided. Basal cell carcinomas should never be treated by radiation in those less than 40 years of age, and should rarely be considered in patients less than 60 years.

Of the surgical options, Mohs micrographic surgery will have the highest cure rate, it is not less convenient or significantly more expensive. Mohs micrographic surgery is the treatment of choice for all radiation-recurrent tumors.

Recurrence rates at five years or longer for common treatment modalities have recently be analyzed by Rowe et al (Table 1). They reviewed all papers published over the past 40 years and confirmed the superior results of treatment by Mohs micrographic surgery.

Squamous Cell Carcinoma

Squamous Cell Carcinoma can metastasize and therefore may not be suitable for local treatment alone; however, the majority of actinic squamous cell carcinomas, excluding the lip and aggressive tumors in the temple area do not metastasize and can be treated in the same manner as basal cell carcinoma. The cure rate of Mohs micrographic surgery is about 95% and the combination of this high cure rate with its characteristic

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ability to spare tissue indicates that this modality can be used for the treatment of squamous cell carcinomas that are similar to basal cell carcinomas.

Invasive and in-situ squamous cell carcinoma of the penis and vulva constitute a special group. These tumors may extend well beyond the clinical margins, e.g.: down the urethra. They are highly suitable for treatment by Mohs micrographic surgery, which should be considered the primary surgical therapy for these tumors.

Other Tumors

Mohs micrographic surgery has been used to treat a number of other malignancies. The most controversial is malignant melanoma. A number of Mohs surgeons claim superior results, but others are concerned that abnormal melanocytes are not visible on frozen sections and advocate routine removal. On the other hand, lentigo maligna, which does grow in continuity, can be removed by Mohs micrographic surgery when permanent sections are used to control the margin after clearance with frozen sections.

Mohs micrographic surgery is the treatment of choice in extramammary Paget's disease. It also appears to produce superior cure rates with:

-
- Dermatofibromasarcoma Protruberans
- Microcystic Adnexal Carcinoma
- Atypical Fibroxanthoma
- Oropharyngeal Carcinoma
- Erythroplasia of Queyrat
- Merkel Cell Carcinoma
- Mutilating Keratocanthoma
- Sebaceous Carcinoma

Summary

Mohs micrographic surgery is a straight-forward, practical technique for the removal of surface malignancies. It is most commonly used for treatment of basal and squamous cell carcinoma, especially larger, aggressive or recurrent tumors. Cure rates for Mohs micrographic surgery are superior to other modalities including radiation and conventional surgical excision. Because of the tissue-sparing property of Mohs micrographic surgery, superior cosmetic results can frequently be obtained.

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Table 1
Five-year recurrence rates of basal cell carcinoma treated by various modalities

Treatment Modality	%	Recurrence/Total pts
Surgical Excision	10.1	264/2606
Curettage & Electrodessication	7.7	274/3373
Radiation Therapy	8.7	410/4695
Cryotherapy	7.5	20/269
Mohs micrographic surgery	1.0	73/7670

After Rowe et al

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CONSENT FOR THE PROCEDURE OF MICROSCOPICALLY CONTROLLED EXCISIONS

1. I authorize Daphne Panagotacos, M.D. to treat _____ for the condition of skin cancer.

2. The technical name of the operation to treat my skin cancer is microscopically controlled excision (Moh's Surgery). This operation has been explained to me by Daphne Panagotacos, M.D. and I understand it to be:

   Following the use of local anesthetic, (and in some cases a sedative), the obvious cancer is removed with a scalpel. A layer of tissue below and peripheral to the obvious cancer is then removed and examined under a microscope. If cancer is present in the first layer, a second layer is taken, and so on until the excised tissue is free of cancer.

3. I consent to the administration of such anesthetics, analgesics, sedatives of other medications as may be considered necessary or advisable by my doctors.

4. The possible alternative methods of treatment have been explained to me. I have been made aware of certain potential risks, signs or symptoms associated with the operation in paragraph 2. Among these are:
   a. Scarring,
   b. Large wound,
   c. Possible need for additional surgery to cover or close the wound,
   d. Temporary (possibly permanent) loss of sensation in the skin surrounding the wound,
   e. Temporary (possibly permanent) loss of muscle motion near the surgical site,
   f. Infection
   g. Possible need for additional surgery to remove all the cancer if it has invaded bone or nerves, and
   h. Possible recurrence of the caner.

5. My questions concerning the operation and its possible outcome have been answered to my satisfaction.

6. I consent to have photographs taken of me for diagnostic purposes and to enhance the medical record. I authorize Daphne Panagotacos, M.D. to publish, display, or otherwise use photographs of me for teaching purposes or to illustrate scientific papers, books, or lectures.

_____ _____
Patient Signature Date

_____ _____
Witness Date