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Patient Instructions for Gamma Knife Radiosurgery

I. Introduction

Gamma Knife radiosurgery can locate the brain lesion precisely by means of the stereotactic technique and high resolution image guide (Magnetic Resonance imaging- MRI, Computed tomography- CT, or angiography). It delivers around 200 gamma rays (from Cobalt-60) focusing on a given target lesion to treat the brain disease.

II. Indications

- i. Vascular malformations – arteriovenous malformation (AVM); dura arteriovenous fistula (DAVF); cavernous malformation....
- ii. Benign brain tumors—meningioma, neurilemmoma, pituitary adenoma.
- iii. Malignant brain tumor – primary malignant brain tumor, metastatic brain tumor.
- iv. Functional neurological disorder—trigeminal neuralgia.

III. Before the procedure

- i. After signing the informed consents of gamma knife radiosurgery, – the associated stereotactic images (CT, MRI or angiography) will be informed by your doctor.
- ii. You will have blood tests, chest x-ray or EKG for doctor's assessment.
- iii. The fertile female patient is advised to take urine test to be sure of absence of pregnancy.
- iv. It usually needs only local anesthetic for the head frame attachment. You don't need to consult the anesthesiologist for general anesthesia, except pediatric patient or one who can not obey the order during the whole gamma knife procedure.

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All information above has been reviewed by Neuro Surgery doctor
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- v. The nurse will help you with hair shaved at the groin if you need to do the angiography.
- vi. You have to wash your hair and keep hair clean. DO NOT use any hair spray before the procedure.
- vii. As the doctor's order, you may be asked not to eat or drink for 6-8 hours except the medicine with sips of water.
- viii. To keep your safety, please inform your doctor and nurse if you have any metal implants or pacemaker because you will be in a strong magnetic field during MRI scanning. Remove any hairpins, zippers, rings, movable dentures, or any objects that may interfere with the MRI procedure.
- ix. The nurse will start an intravenous line and give you a patient's gown to wear. You will be transported to Gamma Knife suite by wheelchair.
- x. If you need to do angiography, the intravenous line will be inserted on your left side arm. Additionally please take off your underwear on the operation day.

IV. During the procedure

You are conscious during the procedure. There are four steps to go through the operation procedure.

- i. Head frame placement
The stereotactic frame will be attached to your head with 4 pins fixation in order to provide great precision to ensure treatment safety.
- ii. Brain image scanning
High resolution images of MRI, CT or angiography are scanned and applied to define the brain target lesion precisely.
- iii. Radiosurgery dose planning
The neurosurgeon makes the treatment plan to determine the radiation dose to the target lesion. The dose plan is finalized after the discussion and confirmation of radiation oncologist and medical physicist.
- iv. Gamma knife treatment
You will feel painless during the irradiation of gamma rays. The treatment time varies from a few minutes to hours depending on the

kind of lesion, location, size, shape, and radiation dose.

V. After the procedure

- i. The pin-sites of head will be covered with antibiotic ointment, band-aids, gauze and elastic bandage to protect the wounds from infection. If pin-sites bleed, let your nurse know immediately.
- ii. The dressing can be removed a couple of hours later while there is no more bleeding at the pin-sites or the bandage is loosening.
- iii. If you feel any discomfort such as headache, dizziness, nausea, vomiting, pin-sites bleeding, etc. Please let your nurse know immediately.
- iv. If you have done the angiography during the procedure, you have post-procedure care to follow:
 1. The nurse will put a sandbag and pressure dressing on the puncture site at groin to stop bleeding. You have to lie still on bed for 6 hours and are able to get out of bed after 12 hours.
 2. If you have difficulty to urinate, please call your nurse for help.
- v. If you feel better after your discomfort symptoms have disappeared, you may be discharged home. Your doctor will prescribe painkiller for you if pain persists at home.
- vi. You can apply the antibiotics ointment on the pin sites to protect the wounds. DO NOT wash your hair for 2-3 days until the wounds heal.
- vii. Continue follow-up with your doctor regularly after surgery.
- viii. Return to ER immediately if any of following condition presents: severe headache, vomiting, seizure or unconsciousness.

Let's take the quiz to make sure you understand

1. The wound on the head is covered with cosmetic glue, gauze and elastic gauze. If there is abnormal bleeding, should the medical staff be informed immediately?
Yes No Don't know
2. If you experience nausea, vomiting, wound pain or bleeding after treatment, should you inform the medical staff if you feel uncomfortable?
Yes No Don't know
3. For patients who undergo combined angiography, can they get out of bed and move around directly after returning to the ward after treatment?
Yes No Don't know
4. If you have a sudden severe headache, vomiting, epileptic seizure, or change in consciousness, should you go to the emergency room for treatment immediately?
Yes No Don't know
5. Do not wash your hair after returning home. Apply antibiotic ointment to the wound on the head as instructed by the medical staff. After about 2-3 days, when the wound epidermis has healed, can you wash your hair?
Yes No Don't know