

Craniotomy for Arteriovenous Malformations (AVM) and Cavernomas

University Neurosurgery Information Sheet

General indications for the procedure:

A craniotomy (opening a window through the skull to access the brain) may be needed to remove a vascular malformation(s) (i.e. AVM, cavernomas, etc.) when they are deemed to be at a high risk for bleeding and/or if they are causing other symptoms such as seizures, headaches, and other neurological deficits.

Description of the procedure:

After the patient is put to sleep with the help of the anesthesiologist, the area of the scalp overlying the lesion is shaved and marked. After a scalp incision is made, a bone window is created with the help of special drills designed for this purpose. In this way, access is gained to the malformation. Then the malformations are removed. This is done by using microsurgical techniques that cut off the many small arteries that feed into the abnormal tangle of blood vessels that make up the AVM. At the end, the bone window is replaced by reattaching it to the surrounding skull.

Risks of the procedure:

The risks of surgery include, but are not limited to: Incomplete resection, need to return to O.R. to take out leftover lesion, bleeding into area of surgery with need to return for evacuation, recurrence, personality changes, inability to smell out of one or both nostrils, complete or partial blindness, injury to the nerves that control eye movements resulting in double vision and/or a droopy eye lid, facial numbness, stroke from involvement of arteries and or veins near the area of surgery with possible inability to move one half of the body, injury or stroke of speech areas, injury to the pituitary gland with possible need for replacement of hormones for life (includes hormone that prevents excessive urination), brain swelling, leakage of brain fluid, hydrocephalus (the inability to circulate brain fluid), incomplete removal, re-growth of the tumor, need for radiation therapy of area of removal, need for re-operation to drain a blood clot after surgery, infection, seizures, breakdown of incision, atrophy of the temple muscle, pain, coma, and death. If the craniotomy involves the middle fossa (mid portion of skull) and/or the posterior fossa (the part where the brain meets the spinal cord and the brain stem), the risks also include: Facial paralysis from involvement of facial nerve, deafness, vertigo, difficulty walking due to cerebellar manipulation, difficulty swallowing with unlikely need for a tracheotomy and feeding tube, difficulty moving the tongue, instability of the skull on the first cervical vertebra, and pain in the posterior aspect of the head.

Procedure alternatives, if any:

Some of these malformations can be treated with radiation. But this depends on factors such as location and size.

Probable consequences of refusing procedure:

If the AVM is not treated, there is a risk that it may bleed over the lifetime of the patient. If it already has bled there are higher risks. Also, other symptoms like headaches and

seizures may persist. The surgeon will discuss what these risks are relative to AVM characteristics such as size, location and the vessels associated with it. If the risks of bleeding and/or significant neurological problems over the life of the patient are higher than the risks of surgery, then it is recommended that the lesions be treated. If the opposite holds true, then radiation or observation may be recommended.

Person(s) performing the procedure:

The surgical team for this procedure is large. This involves, but is not limited to, the attending surgeons, resident surgeons, surgical nurses, physician assistants, surgical technologists and anesthesiologists. Everyone involved will be performing important tasks related to the surgery in accordance with the hospital policies, and based on their skill set and under the supervision of the responsible practitioners.