



Craniectomy

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What is it?

Craniectomy is neurosurgical procedure that involves removing a portion of the skull in order to relieve pressure on the underlying brain. This procedure is typically done in cases where a patient has experienced a very severe brain injury that involves significant amounts of bleeding around the brain or excessive swelling of the brain.

What is its goal?

Craniectomy is typically performed as a life saving measure. Patients who have experienced a severe brain injury that is life threatening may have bleeding around their brain or swelling of their brain so severe that it can lead to brain compression and brain death. In this type of dire situation, neurosurgeons can remove a portion of the skull, evacuate any underlying clot that is compressing the brain, and relieve pressure on the brain. Furthermore, because the brain typically experiences a great deal of swelling after a severe injury, removing the bone frees the brain to swell upward rather than downward where it will compress the brainstem, which is critical for all of the basic vital functions, leading to brain death. Over time the brain swelling will subside and the bone that was removed can be replaced.

How is it done?

Patients with brain injury severe enough to warrant craniectomy are usually already in the hospital and are being monitored very closely. Patients are brought to the operating room, where the anesthesia personnel

will continue to closely monitor their vital signs.

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Meanwhile the neurosurgeons will make an incision in the scalp, typically on the side of the head where the most compression is taking place (especially in cases where the compression is caused by a blood clot). Once the skin and underlying tissues have been cut and moved out of the way, a drill is used to make holes in the skull. The holes are connected with a saw and the bone is removed. Typically the bone is stored in a freezer in hopes that, once the patients' brain swelling has subsided and their condition is more stable, the bone may be put back in place. While the bone is removed, patients are provided with a custom fit helmet that they wear to prevent further brain injury. Once the bone is removed, and any bleeding around the brain has been controlled, the skin and connective tissue overlying the brain are closed with sutures.

What are the risks?

The major risks of the operation are bleeding and infection and further damage to the brain. As previously stated, patients who require craniectomy as a life saving measure are usually in very critical condition and have in all likelihood already experienced some amount of brain damage. Nevertheless, the surgical team makes every effort to limit the risks of the operation to the patient by administering antibiotics before beginning, controlling all bleed encountered during the surgery, and limiting the amount of manipulation of the brain.

How long will I stay in the hospital?

Because patients who undergo craniectomy are in critical condition to begin with, their stay in the hospital is determined by the extent of their other injuries as well as damage to their nervous system. Typically patients who have a severe brain injury will require months to years to recover from their injury, depending on the extent of injury. These patients usually benefit from intensive rehabilitation to regain as much brain function as possible. Replacement of the bone removed at the time of craniectomy is usually performed several months after the original injury. The bone is tested for the presence of bacteria. If there is no bacterial growth,

the bone can be used. Otherwise, a synthetic skull replacement must be used instead. Please see the Cranioplasty section for more information regarding this procedure.

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