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Title
Prevention of cranial hemorrhage in patients undergoing craniotomy using helmet orthosis

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Summary
Among the craniotomy patients in the statistical population of Rajaee Hospital of Shiraz,2 out of 100 craniotomy patients have been diagnosed with hemorrhage. Helmet orthosis was used in this study on 259 patients undergoing craniotomy. Using the Helmet Orthosis no hemorrhage observed in any of them

Introduction/ Basics
A brain surgery in which part of the skull bone is temporarily removed to access brain tissue is called craniotomy.

Skull opening is performed by surgery to remove a tumor, reduce internal pressure, or drain the blood clot.

Specific skull complications include:

• strike

• Seizures

Brain tissue swelling that may make the patient a candidate for a second craniotomy.

• Nerve damage that can cause muscle paralysis or temporary muscle weakness.

Cerebrospinal fluid leakage that may need to be restored.

• Decreased mental functioning

• Permanent brain injury and related disabilities

Orthosis is a set of tools used to correct the condition of an organ, aid in the function of the organ, or alternatively replace the function lost.

There is no study available in the literature reporting utilizing a helmet to stop bleeding.

The neonatal corrective helmet may be used as a post-operative protective helmet for this purpose after surgery.

Methods/ work process

Helmet orthosis, previously used only for children with skull deformity, was used in this study on 259 patients undergoing craniotomy and Individual skull molding was then performed for each patient with appropriate materials. The helmet was then made using the negative mold and filled with plaster to form the positive mold. The positive mold then need to go under modification before pulling 4mm width tempreture-resistant Polyethylene (PE) on it.
to avoid hurting the patient's skull a 5mm Plastazote was used on the inner side of the helmet which is in touch directly with the skull. A mesh-like surface was designed on the helmet to facilitate air circulation.

Implementation

Patients undergoing craniotomy to reduce skull pressure after trauma sometimes develop skull hemorrhage, which can cause many complications. No skull hemorrhage was observed among the statistical population after making use of the orthosis.The helmet also prevents mild head movements that cause bleeding.

Conclusion

Although the number of patients who experience cranial hemorrhage is not significant, this population is very important due to the potential complications and subsequent risks. this helmet orthosis could prevent hemorrhage completely in the gap between craniotomy and cranioplasty in this statistical population.

References

Hsu, John D., John Michael, and John Fisk. AAOS atlas of orthoses and assistive devices E-Book. Elsevier Health Sciences, 2008.