A Safer and Highly Efficient Craniotome

Disease Area: brain conditions
Application: surgical device
Inventors: Dr. Chengyuan Wu and Dr. Ashwini Sharan, two surgeons at Thomas Jefferson University's Department of Neurosurgery

Invention Description:

A new type of craniotome head that creates angled cuts for cranial neurosurgical procedures. The novel craniotome head automatically makes an angled cut while held perpendicular to the skull and is designed to fit into present electric or pneumatic drill systems. The angle of the head can be pre-set or, adjust as desired by a surgeon.

A quarter of a million craniotomies are performed in the US each year. After the procedure on the brain is completed, the bone flap, which was removed from a section of the skull, is secured back on the skull using small plates and screws, or several small clamps to hold the bone flap firmly in place. The new craniotome head makes it easier for the surgeon to cut the bone flap such that the outer part of the bone flap is larger than the inner part. This shape of bone flap possesses an improved structural integrity over a bone flap with straight sides because the former is less likely to become recessed below the rest of the skull surface. Also, the angled cuts may allow for fixation of the bone flap back to the skull with screws alone, eliminating the need for plates.

Competitive Advantages:

The invention creates an angled cut in the skull and protects the dura from the cutting edge of the drill while currently available drills produce cuts perpendicular to the skull and do not protect the dura if the drill bit is angled. Since the angle cut reduces the likelihood of the bone flap becoming recessed, it subsequently reduces the risk of damage to the underlying brain. Also, by minimizing the hardware used to secure the bone flap, post-surgery, the risk of erosion of the overlying skin and associated wound infections is greatly reduced. In addition to overall enhanced patient safety, the bone flap shape and reduced hardware improves the cosmetic appearance.

Intellectual Property: A patent application has been filed

Business Opportunity: The technology is available for licensing

Follow-up:

Please contact Michael Caggiano at michael.caggiano@jefferson.edu or +1-215-955-6862 in The Office of Technology Transfer and Business Development at Thomas Jefferson University, citing Jefferson docket number (WU_CHE.002H).