Burr hole trephination

Trepanning, also known as trepanation, trephination, trephining or making a burr hole (the verb trepan derives via Old French via Medieval Latin from the Greek noun of relevant meaning trypanon, literally "borer, auger") is a surgical intervention in which a hole is drilled or scraped into the human skull, exposing the dura mater to treat health problems related to intracranial diseases with a trephine.

It may also refer to any "burr" hole created through other body surfaces, including nail beds. It is often used to relieve pressure beneath a surface.

Trepanation, is an ancient form of a primitive craniotomy. There is widespread evidence of contributions made to this practice by ancient civilizations in Europe, Africa, and South America, where archaeologists have unearthed thousands of trepanned skulls dating back to the Neolithic period.

Indications

Burr hole trephination for chronic subdural hematoma.

Burr hole trephination for external ventricular drain.

Trauma flap.

Brain biopsy.

Evidence of trepanation has been found in prehistoric human remains from Neolithic times onward. Cave paintings indicate that people believed the practice would cure epileptic seizures, migraines, and mental disorders.

The bone that was trepanned was kept by the prehistoric people and may have been worn as a charm to keep evil spirits away. Evidence also suggests that trepanation was primitive emergency surgery after head wounds to remove shattered bits of bone from a fractured skull and clean out the blood that often pools under the skull after a blow to the head. Such injuries were typical for primitive weaponry such as slings and war clubs.

There is some contemporary use of the term. In modern eye surgery, a trephine instrument is used in corneal transplant surgery. The procedure of drilling a hole through a fingernail or toenail is also known as trephination. It is performed by a physician or surgeon to relieve the pain associated with a subungual hematoma (blood under the nail); a small amount of blood is expressed through the hole and the pain associated with the pressure is partially alleviated.

Thorough analysis of the available archeological and literary evidence reveals that trepanation was widely practiced throughout China thousands of years ago. A significant number of trepanned Chinese skulls have been unearthed showing signs of healing and suggesting that patients survived after surgery. Trepanation was likely performed for both therapeutic and/or spiritual reasons. Medical and historical works from Chinese literature contain descriptions of primitive neurosurgical procedures.

These include stories of surgeons, such as the legendary Hua Tuo, and surgical techniques used for the treatment of brain pathologies. The lack of translation of Chinese reports into the English language and/or lack of publications on this topic in the English language may have contributed to the misconception that ancient China was devoid of trepanation. A paper summarizes the available evidence attesting to the performance of successful primitive cranial surgery in ancient China [1].

Complications

One of the surgery-related complications of burr-hole craniostomy is intracranial subdural empyema (SDE). If not recognized and treated early, SDE may be complicated by cerebral abscess, cortical venous thrombosis, or localized cerebritis and may lead to death [2].

Books

Trepanation, Trephining and Craniotomy History and Stories

[1]

Hobert L, Binello E. Trepanation in Ancient China. World Neurosurg. 2016 Oct 18. pii: S1878-8750(16)31039-7. doi: 10.1016/j.wneu.2016.10.051. Review. PubMed PMID: 27769950.

[2]

Agrawal A, Timothy J, Pandit L, Shetty L, Shetty JP. A review of subdural empyema and its management. Infect Dis in Clin Pract 2007;15:149-53.

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