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Kartik Shivam, Verma Jahnavi

BRAIN SURGERY WITH SOUND WAVES

Tutor H.O.D assosiate, prof. Ph.D. Isoifovich A. A.
Department of Radiology and Radiotherapy
Belarusian State Medical University, Minsk

The brain is our body's most complicated and intriguing organ. The brain is involved in many aspects of life, including thinking, memory, emotions, and behavior.Every year, an estimated 22.6 million people suffer from neurological illnesses or accidents that necessitate the help of a neurosurgeon, with 13.8 million of them requiring surgery. The fact that once these nerve cells are destroyed, the disease is irreversible, i.e. the cells do not recover, is a key constraint in treating physical brain and spinal cord injuries. Diseases including Parkinson's, dementia, and multiple sclerosis cause irreversible nerve damage that is now incurable.

This problem has a ground-breaking answer that is, Brain surgery with sound waves is used to treat a variety of brain disorders and conditions, including tumors, epilepsy, cancer and stroke. This type of surgery uses sound waves to assist remove tumors from the brain while preserving healthy tissue in the surrounding area. In some cases, parts of the skull may need to be removed.This difficulty, however, can be solved using sound waves.This study provided the assessment of Brain surge with the help of sound waves that is an innovative, non-invasive treatment that has shown to reduce risk and time to recover from tremors, strokes, and other neurological injuries.

Using a novel ultrasound device in conjunction with magnetic resonance imaging (MRI), small portions of dysfunctional brain tissue can be accurately burned away without harming the skin or opening the skull. Patients with other diseases, such as Parkinson's disease, will be tested next, according to the researchers. Tremors are much relieved by it. The ultrasound utilized for diagnostic purposes, such as prenatal screening, is not the same as high-intensity focused ultrasound (HIFU). High-intensity ultrasound beams are focused into a small area of sick tissue using a specialized equipment, heating and killing it. The method is now being tested for the removal of tumors from breast and other malignancies, as well as ablation of uterine fibroids, which are small benign tumors in the uterus.

The current and future applications of magnetic resonance image-guided focused ultrasound surgery (MRGFUS) were thoroughly investigated. MRgFUS is a cutting-edge technology in the field of new ultrasound-based treatments with ablative intent. As a promising and non-invasive technique, MRgFUS has the potential to reduce mortality, reduce medical costs, and open up new avenues for the treatment of patients with CNS diseases. MRgFUS, on the other hand, is still in its infancy. Skin burns and coagulative necrosis of adjacent heat-sensitive tissues are dangerous and not negotiable side effects. More patient data are required to confirm the MRgFUS approach's definitive feasibility in CNS. As a result, this technology is still in its early stages.A number of factors have contributed to this advancement, including advances in transducer design, more accurate measurement and calibration of acoustic power, and careful experiments to determine the precise nature of chemical processes occurring during and after tissue exposure to ultrasound. Some fields where ultrasound is used have seen significant advancements, including physiotherapy, surgical instruments, chemotherapy, drug delivery, and, more recently, high intensity focused ultrasound (HIFU).

In this research with this New techniques to the treatment of brain malignancies are urgently needed. Focused ultrasound, with its capacity to precisely target and kill sick areas while sparing healthy neighboring brain tissue, could be the breakthrough that patients and doctors have been waiting for.