Researchers at the University of South Florida have developed the “Sonic Window” Cranioplasty Implant, a sonolucent window that allows for observation of intracranial anatomy and pathology via ultrasound, which is normally blocked by the closed skull. This invention will prove useful in the management of hydrocephalus in an effort to reduce the rising cost of imaging, risk of imaging, and inconvenience to patients.

Hydrocephalus is a medical condition characterized by the abnormal accumulation of cerebrospinal fluid (CSF) in the ventricles of the brain. There is no cure for the condition and proper treatment requires regular surveillance via physical examination and neuroimaging. For years the standard imaging procedures used included computed tomography (CT) scans or magnetic resonance imaging (MRI). Today, CT scans are discouraged due to the concern of exposure to radiation. Alternatively, MRI scans can be significantly more expensive and lengthy procedures that require sedation for young patients who can become nervous or restless. Ultrasound imaging has emerged as a preferable method for monitoring the condition for young infants, as their cranial structures are not yet fully formed. However, once the skull becomes completely developed, ultrasound is no longer useful and imaging options are again limited.

Our inventors have found a way to circumvent this issue with the “Sonic Window” Cranioplasty Implant. The device is made of sonolucent materials and has an interconnected pore structure that allows unattenuated passage of ultrasound waves. This provides a convenient method for viewing the intracranial pathology of hydrocephalus patients and their response to treatment. Added benefits include improved responsiveness and quality of care provided by neurosurgeons at a lower imaging cost as well as lower imaging and infection risks. The novelty of this implant will ultimately change current hydrocephalus imaging practices and optimize patient outcome for this life long condition.

ADVANTAGES:

- Improves management of hydrocephalus treatment
- Optimizes patient outcome for life long condition
- Reduces patient imaging risks
- Minimizes expenses for healthcare

Sonolucent Implant for Ultrasound Imaging

Left: Top view of sonic window implanted within a patient. Right: Side view of the patient with illustration of ultrasound imaging through the sonic window

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