

AUTOMATED ALGORITHM TO EVALUATE AND PREDICT RISK OF MALIGNANT EDEMA AFTER STROKE

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Value Proposition: *Novel Imaging algorithm process that uses a deep learning neural network prediction model for diagnosing cerebral edema in post-stroke patients.*

Technology Description

Researchers at Washington University in St. Louis have developed a novel set of algorithms for detecting CSF ratios in stroke patients between the affected and unaffected brain hemispheres. Stroke is the fifth most common cause of death in the United States. Cerebral edema (CED) is a severe complication of stroke and causes endothelial dysfunction of the capillaries, thereby resulting in the breakdown of the blood-brain barrier. Accurate CED diagnosis is critical for choosing the optimal treatment. However, current imaging modalities lack sensitivity with few viable disease biomarkers.

This invention utilizes an automated imaging algorithm that can extract novel metrics from CT scans of patients with a stroke. These metrics are then combined into a deep learning neural network prediction model that achieved very high sensitivity and precision in predicting patients at risk for death or who would need surgery. This software allows physicians to identify patients at risk for CED, provide optimal treatment, and reduce the high mortality rate.

Stage of Research

Generated data using their software in over 900 patients and showed the ability to both predict CED and determine the severity of the disease.

Applications

Diagnostic for predicting CED

Key Advantages

- The first non-invasive diagnostic modality to accurately identify CED in post-stroke patients by measuring ratios of CSF in the two hemispheres of the brain.
- Does not require a baseline CT for CED prediction.
- Determines grade and severity of CED.

- May facilitate early treatment, reduced morbidity, and mortality.
- Integrates within leading cardiac CT software and imaging systems.

Patents

Patent application filed

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