Minimal invasive novel technique in intracranial hemorrhage management

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Spontaneous intracerebral hemorrhage (ICH) is one of the most frequently encountered medical and surgical emergencies. It represents 15 to 30% of all stroke cases and results in a 40% mortality rate, according to international statistics. It is a life threatening condition and leaves most survivors with a disability, which consumes a significant amount of resources from various medical specialties.

Despite the wide span of primary and secondary implications caused as a result of spontaneous intracerebral hemorrhage, a debate continues in regards to the current management plan in place. This has inspired several international studies and trials (e.g. Surgical trial of ICH (STICH) and Minimally Invasive Surgery Plus Rt-PA for ICH Evacuation Phase II (MISTIE) studies) in attempt to standardize management guidelines with the conclusion of hematoma growth and secondary edema formation are correlated with clinical deterioration, poor clinical outcome and death.

A minimally invasive approach to the evacuation of ICH has been a topic of interest for some time. In 2007, Auer et al published a study on the early endoscopic irrigation and aspiration-based evacuation of IVH. This trial demonstrated a significant decrease in the 6-months mortality rate compared with medical management. More recently, the MISTIE II trial showed a strong trend toward clinical benefits for patients with ICH treated with minimally invasive surgery followed by catheter drainage with daily recombinant tissue plasminogen activator (Rt-PA) irrigation. However, the Catheter drainage with t-PA was slow and increase symptomatic hemorrhage.

The medical goal of this study is to make advancements on the limited number of clinical findings that gravitate toward ICH volume reduction as an effective and fast therapeutic approach. Such as, minimally invasive evacuation of ICH and intraventricular hemorrhage (IVH) can be achieved with the Apollo system and it represents a potentially important advantage for patients’ in whom surgical and medical treatment options are limited.

Studies are required to demonstrate and evaluate the efficacy of aspiration for hematoma evacuation and to determine which subsets of patients are most likely to benefit from this surgery based on MRI findings. The objectives of this study will be to obtain data regarding the physical properties of the hematoma (consistency and firmness) which will be determined by different methods; for instance: penetrometer and measuring the concentration of thrombin and fibrin; in order to determine the capabilities and end limitation of the Apollo suction device. After identifying the clot consistency, MRI signal changes will be correlated in order to identify and select patients most likely to benefit from the promising minimally invasive device.
The Apollo suction device utilizes a small, relatively harmless technology that is compatible with neuro-navigation and endoscopic techniques. This study will be conducted to prove that this approach will minimize damage to viable surrounding brain tissue and decrease the percentages of disability and mortality for patients suffering from ICH. The Apollo system is unique in its method and the fact that it is not a highly difficult procedure makes it highly feasible in most of neuroscience centers.