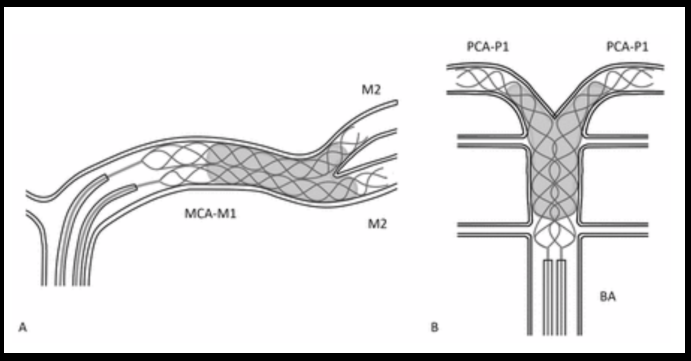

Fig 1. A schematic diagram depicting the mechanism of vessel navigation through the middle and posterior cerebral arteries during a mechanical thrombectomy procedure.

towards the site of stroke and approaches the blood clot, it expands, pressing the clot against the sides of the vessel. As a result, the clot dislodges itself from the walls of the artery, blood flow is allowed once more, and the stent retriever captures the blood clot to prevent future stroke recurrence. Thus, neurological circulation is reestablished, and an unprecedented result is reached after a short recovery period – the patient's life is completely normal again.

In order to quantify the validity of this treatment, an experiment was run to compare its efficacy to current stroke protocol. 238 stroke victims were treated with both the control (current stroke protocol) and the intervening (mechanical thrombectomy) treatment. The obtained results were so astonishing that the trial was halted before completion, a resounding stamp of approval as a superior treatment against the status quo - – the mortality rate for patients treated by mechanical thrombectomy was nearly half of those who underwent the current intravenous alteplase (a prominent clot-busting medication) treatment. Furthermore, twice as many mechanical thrombectomy patients were able to return to independent function, suggesting an even higher level of efficacy past mortality prevention [8]. Other similarly conducted trials have displayed similarly positive results while additionally corroborating the notion that mechanical thrombectomy patients are able to maintain a higher quality of life years after undergoing surgery, giving us a glimpse of hope to one day call mechanical thrombectomy an absolute cure rather than a treatment [9].

Although mechanical thrombectomy seems the clear and superior treatment method, ischemic stroke still affects a significant amount of the elderly population. In addition, the existence of mechanical thrombectomy as a treatment is largely unheard of due to its difficulty to implement as a ubiquitous and equitable solution amongst populations. The procedure is incredibly difficult and thus highly specialized, so a small number of neurosurgeons are able to conduct the surgery to treat the millions of Americans that undergo ischemic stroke every year. In fact, there are only enough neurointerventionalists to treat 15% of stroke victims in the world [10]. Furthermore, mechanical thrombectomy procedures are only effective if implemented imminently, and this criteria is difficult to uphold due to the spontaneity of an ischemic stroke attack and the complexity of a procedure [11]. These are significant obstacles that prevent medical thrombectomy from being regarded as a widespread treatment for stroke, and it may not be decades later until we overcome them.

Though mechanical thrombectomy is already an extremely effective and tangible treatment, it also represents a stepping stone for future surgical innovation. By possessing the ability to traverse the intricate network of arteries and veins near the brain, this variant of thrombectomy establishes a precision that future innovations will use as a model. Ultimately, though the ischemic stroke rate will inevitably grow in the future, we hope that mechanical thrombectomy serves as a prominent stalwart, ensuring that a common yet severe disease will result in a similarly common recovery.