

## Introduction

Surgical thrombectomy is a type of surgery to remove a blood clot from inside an artery or vein.

Normally, blood flows freely through your blood vessels, arteries, and veins. Your arteries carry blood with oxygen and nutrients to your body. Your veins carry waste products back to the heart. In some cases, the blood thickens and clumps to form a blood clot in one of these vessels. This can block the blood flow. When blood flow is blocked, nearby tissues can be damaged.

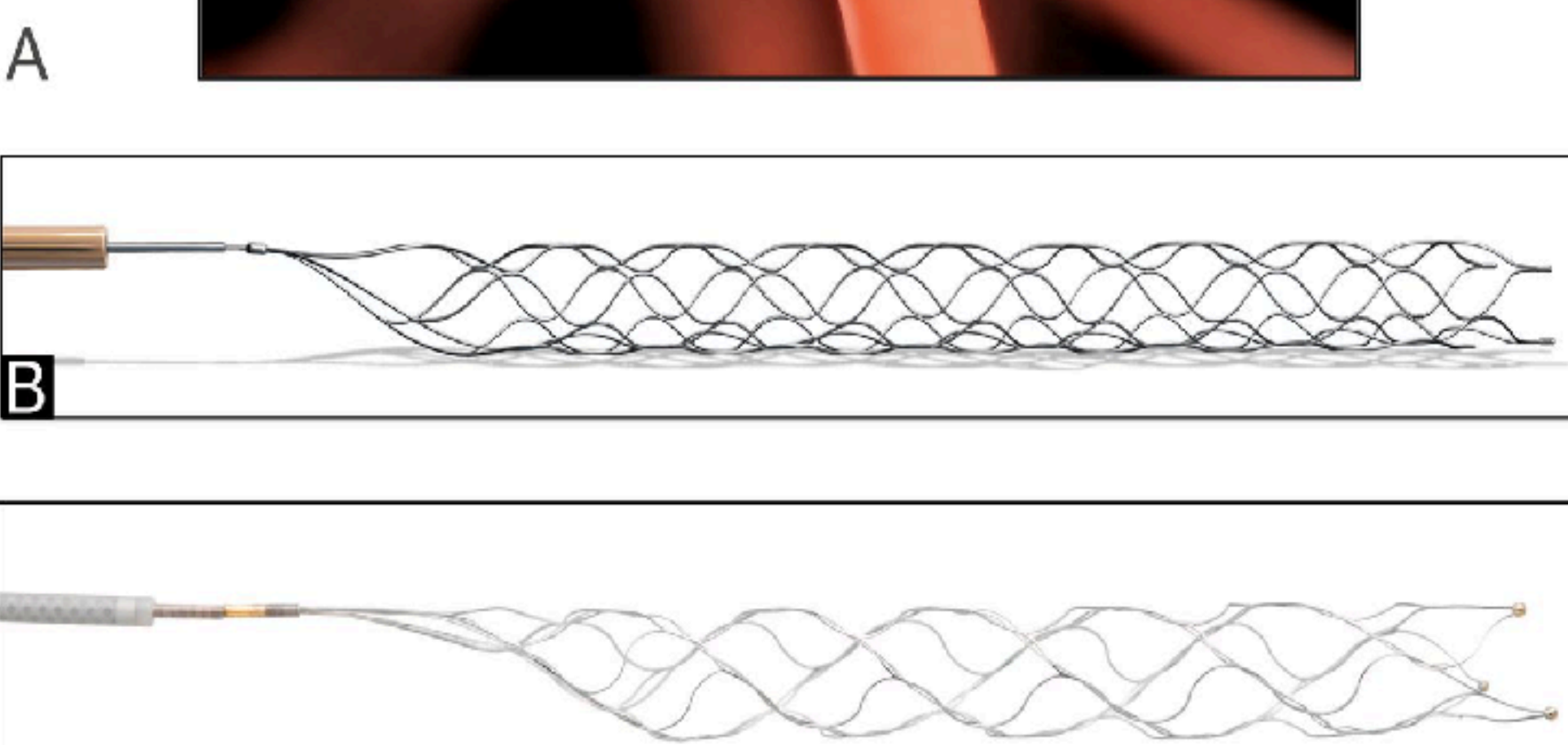
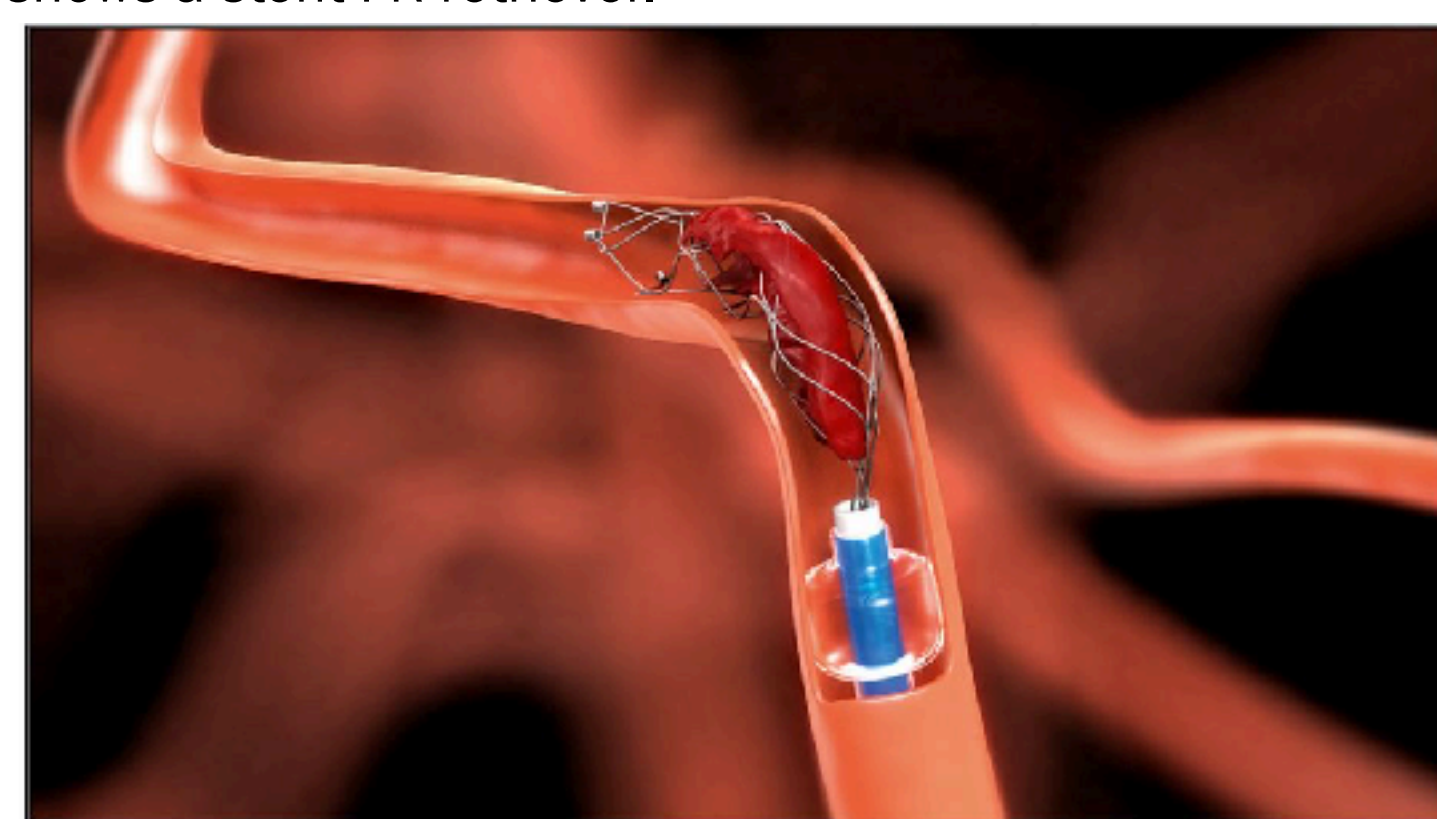
During a surgical thrombectomy, a surgeon makes an incision into a blood vessel. The clot is removed, and the blood vessel is repaired. This restores blood flow. In some cases, a balloon or other device may be put in the blood vessel to help keep it open. (1)

## Brief History

The introduction of mechanical intra-arterial clot retrieval into clinical practice heralds a new age in the acute management of ischaemic stroke for patients with acute large artery occlusive stroke. The Food and Drug Administration gave clearance to the first endovascular device: Merci Retrieval System (MERCi), in August 2004.

There were other tests in 2013 which failed to show any improvement in efficiency but in 2015 a new model was introduced called the New-generation stent retriever devices (the Solitaire FR Revascularisation Device) were studied in two small randomised controlled trials, which showed significantly better recanalisation compared with the older MERCi device. (2)

Figure 1 shows a stent FR retriever.



### Thrombectomy

#### Catheter aspiration thrombectomy

Blood clot is removed using suction

#### Mechanical thrombectomy

Blood clot is broken up into small pieces and removed

Figure 2: show an example of the aspiration method of thrombectomy

## Procedures How does it work?

During the mechanical thrombectomy:

- A catheter is threaded into an artery or vein until it reaches the blood clot causing the stroke
- Using x-ray guided imaging, a stent retriever is inserted into the catheter
- The stent reaches past the clot, expands to stretch the walls of the artery so blood can flow, and is “retrieved” – or pulled backwards – which removes the clot (3)

## Different techniques

There are three main different techniques used to in mechanical thrombectomy,

- The first being the coil retrievers which has a rather high mortality at 31% and a recanalization success of 54%.
- The second one being aspiration devices in which has the highest mortality rate at 33% and the recanalization rate wasn't reported.
- The last and the most successful type is the Stent retrievers and this has the lowest mortality rate of 17% and recanalization rate of 83% (4)

## Risk

As with all surgeries thrombectomy has many different risk factors and they include many but most importantly are either common surgical or post surgical complications or risks. the most common being:-

- 1- Excess bleeding that can be so severe it can cause death.
- 2- Infection
- 3- Damage to blood vessels at the site of blood clot
- 4- Pulmonary embolism
- 5- there is also the risk of the blood clot will form again (1)

## Conclusion

Mechanical thrombectomy has a bright future and it can be an effective change in the treatment of artery occlusion or thrombus in the body. But its use still has a lot of obstacles the main being the rehabilitation of most centers that have been so dependent on other methods of treating thrombus. the other problem is that its very expensive to operate but these obstacles could be overcome in the not so far future, but as of now thrombectomy isn't the sole solution to thrombus treatment but it has to be used adjunct to thrombolysis.

## Reference:-

- 1- [https://www.hopkinsmedicine.org/healthlibrary/test\\_procedures/cardiovascular/surgical\\_thrombectomy\\_135,372](https://www.hopkinsmedicine.org/healthlibrary/test_procedures/cardiovascular/surgical_thrombectomy_135,372)
- 2- Health and Social Care Information Centre. Quality and Outcomes Framework (QOF)–2014-15. 2015, Available:
- 3- Saver J, Jahan R, Levy EI, et al. Primary results of the SOLITAIRE™ With the Intention for Thrombectomy (SWIFT) multicenter, randomized clinical trial [online]. Available at: [http://my.americanheart.org/idc/groups/ahamh-public/@wcm/@global/documents/downloadable/ucm\\_436093.pdf](http://my.americanheart.org/idc/groups/ahamh-public/@wcm/@global/documents/downloadable/ucm_436093.pdf) Accessed May 5, 2012
- 4- Eloffke P, Reid JM, Rana A, et al. Disappearance of the hyperdense MCA sign after stroke thrombolysis: implications for prognosis and early patient selection for clot retrieval. *J R Coll Physicians Edinb* 2016;46:81–6. doi:10.4997/JRCPE.2016.203

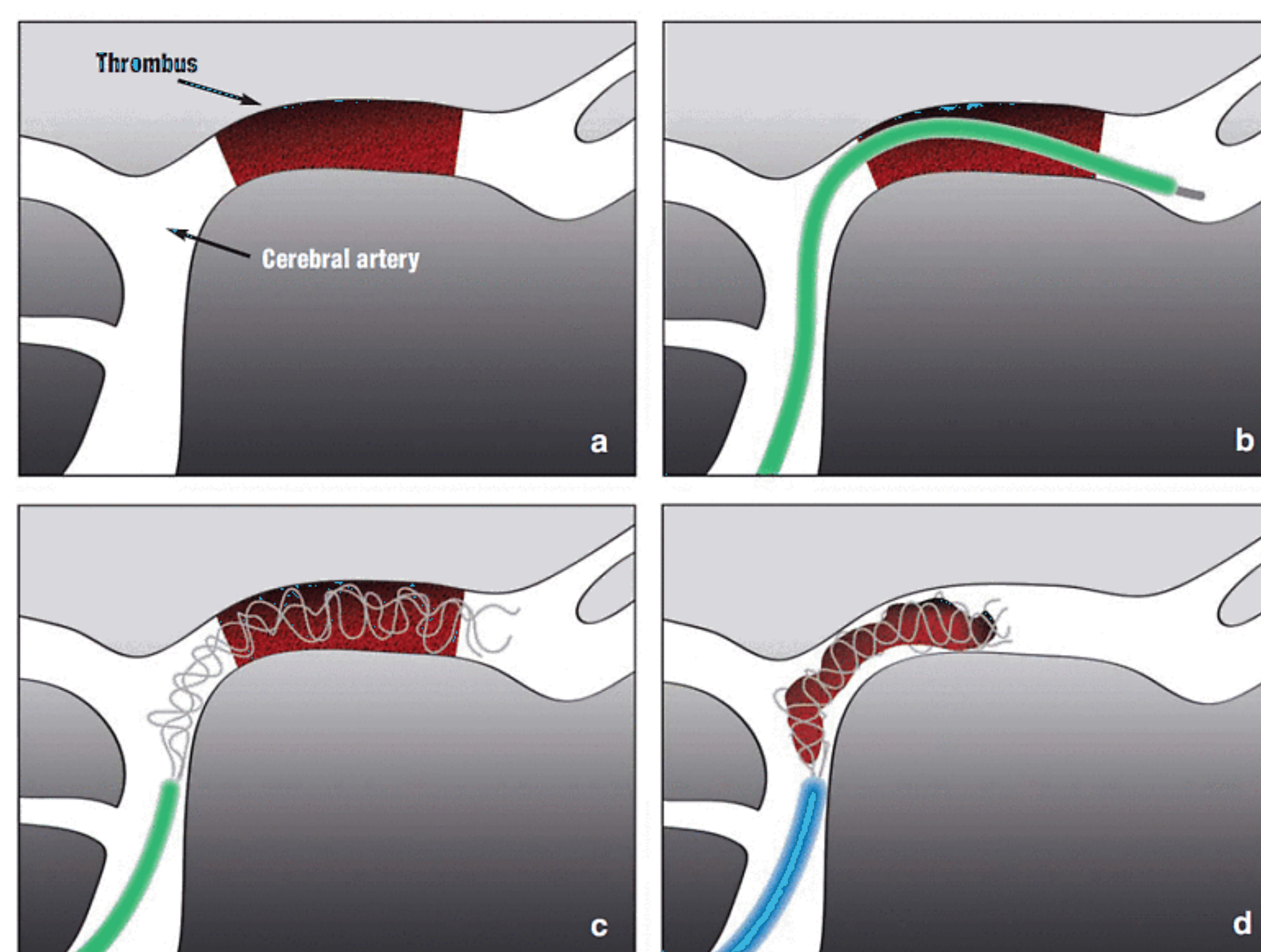


Figure 3 shows an example of the stent retriever method in a) Shows a thrombus in the cerebral artery b) The stent retriever is run past the thrombus [c] and d)] When the micro catheter is retracted the stent is released and stent holds the thrombus pulls it with it.