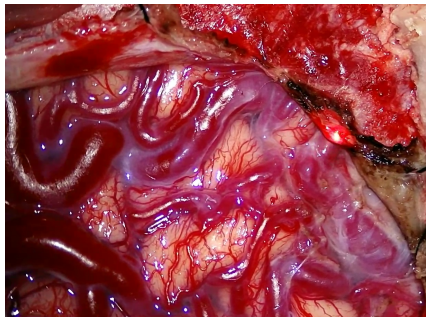
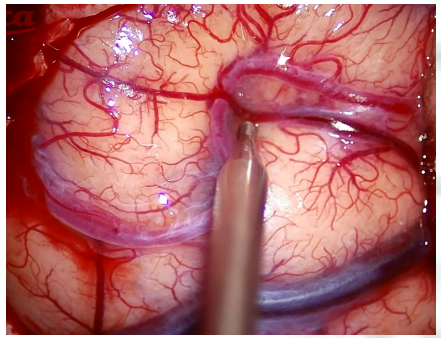
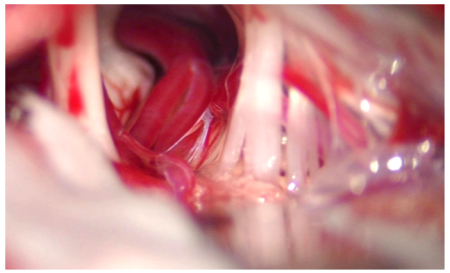
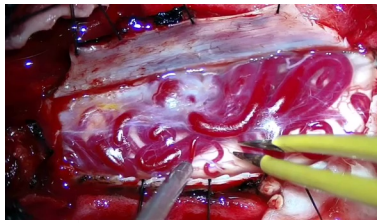
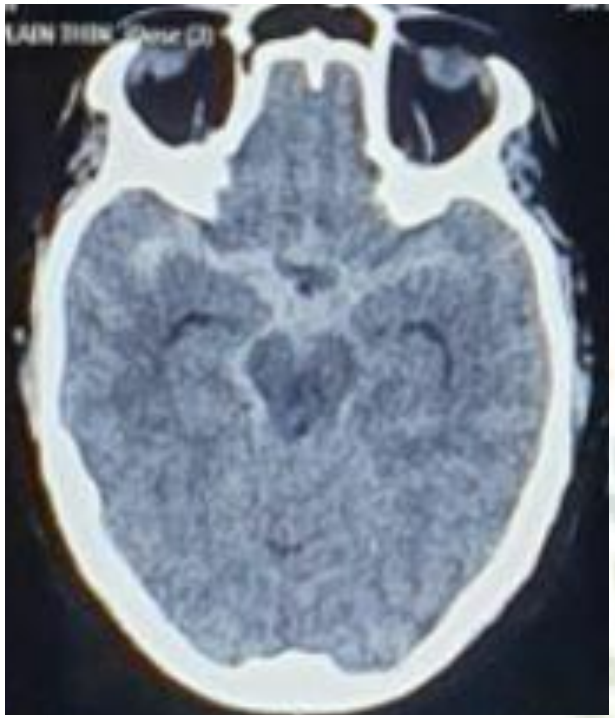


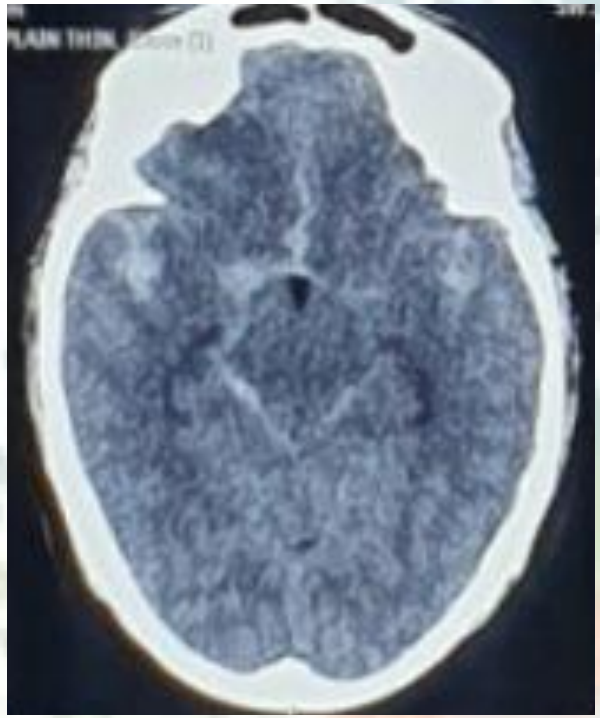





Sridhar's Operative Neurosurgery Atlas

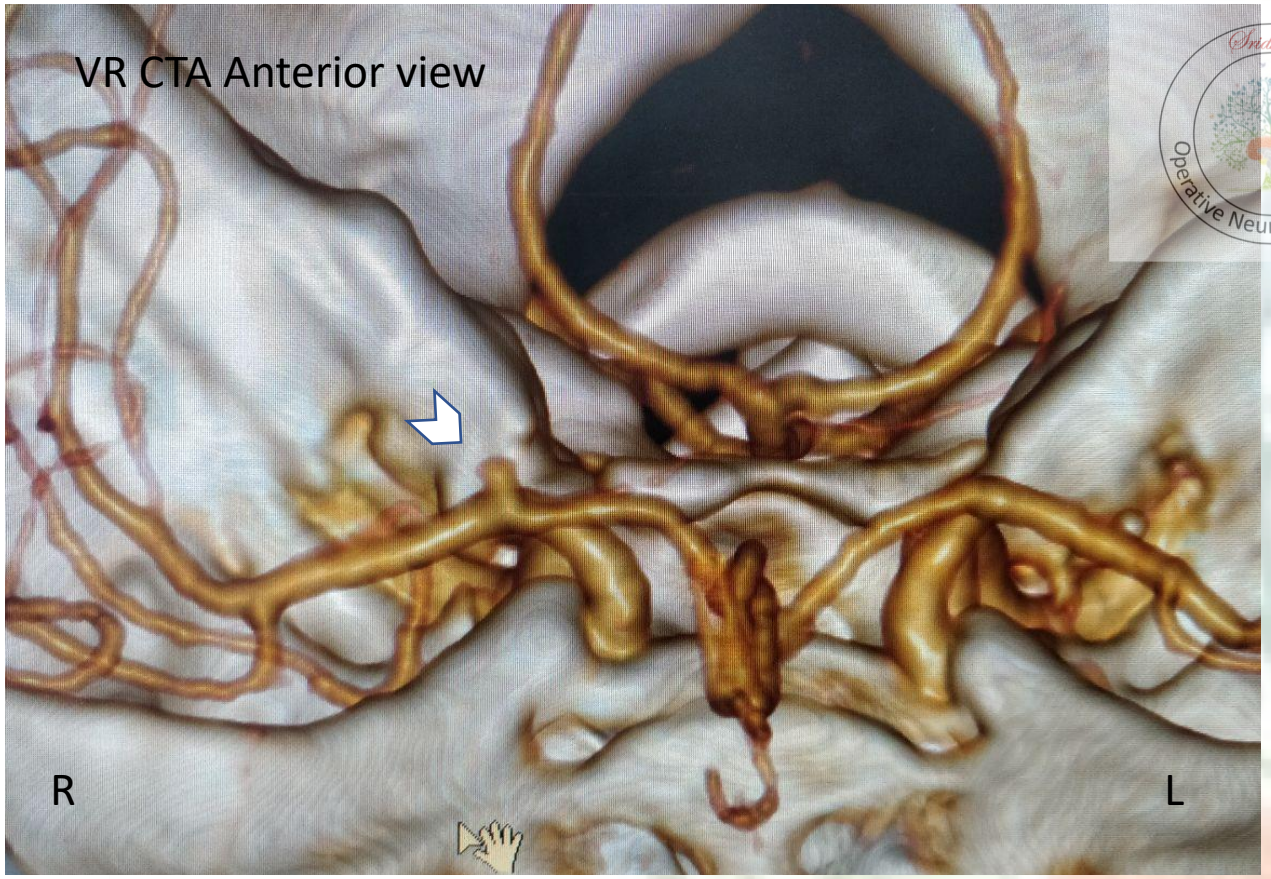
Aneurysms

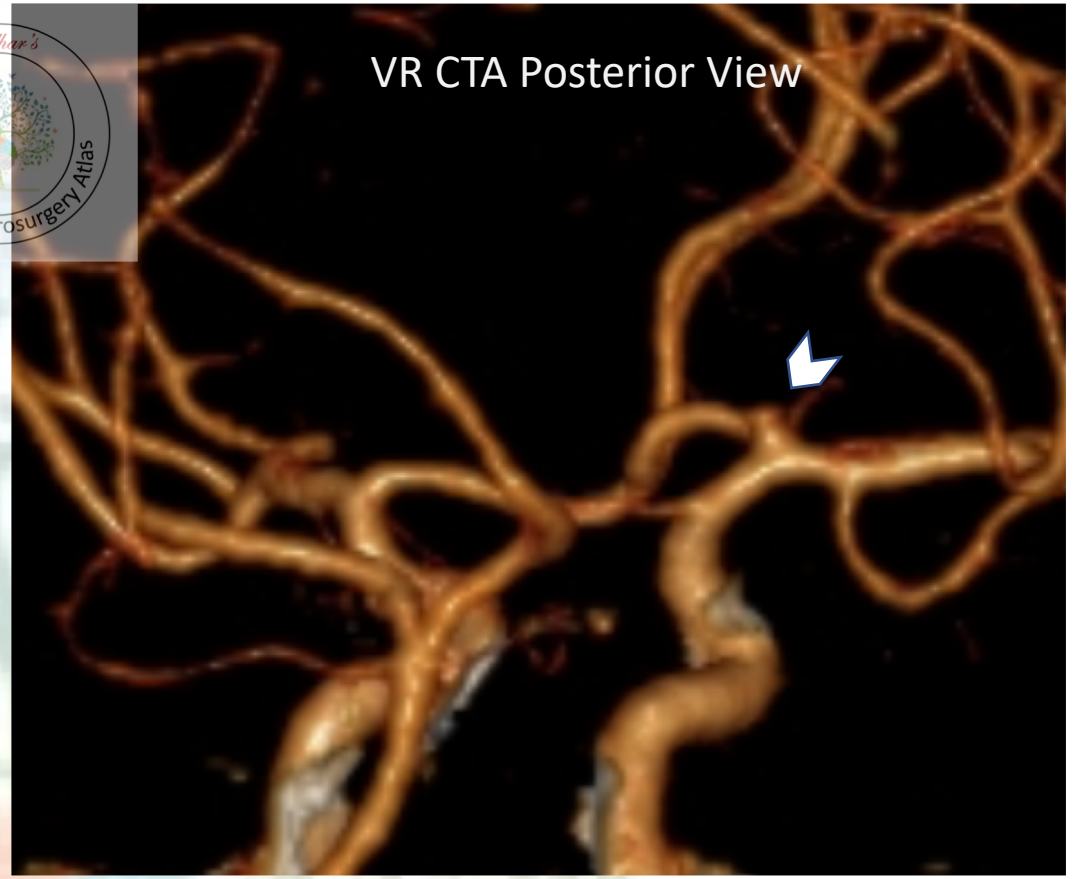
Microsurgical Clipping of Internal Carotid Artery Bifurcation Aneurysm





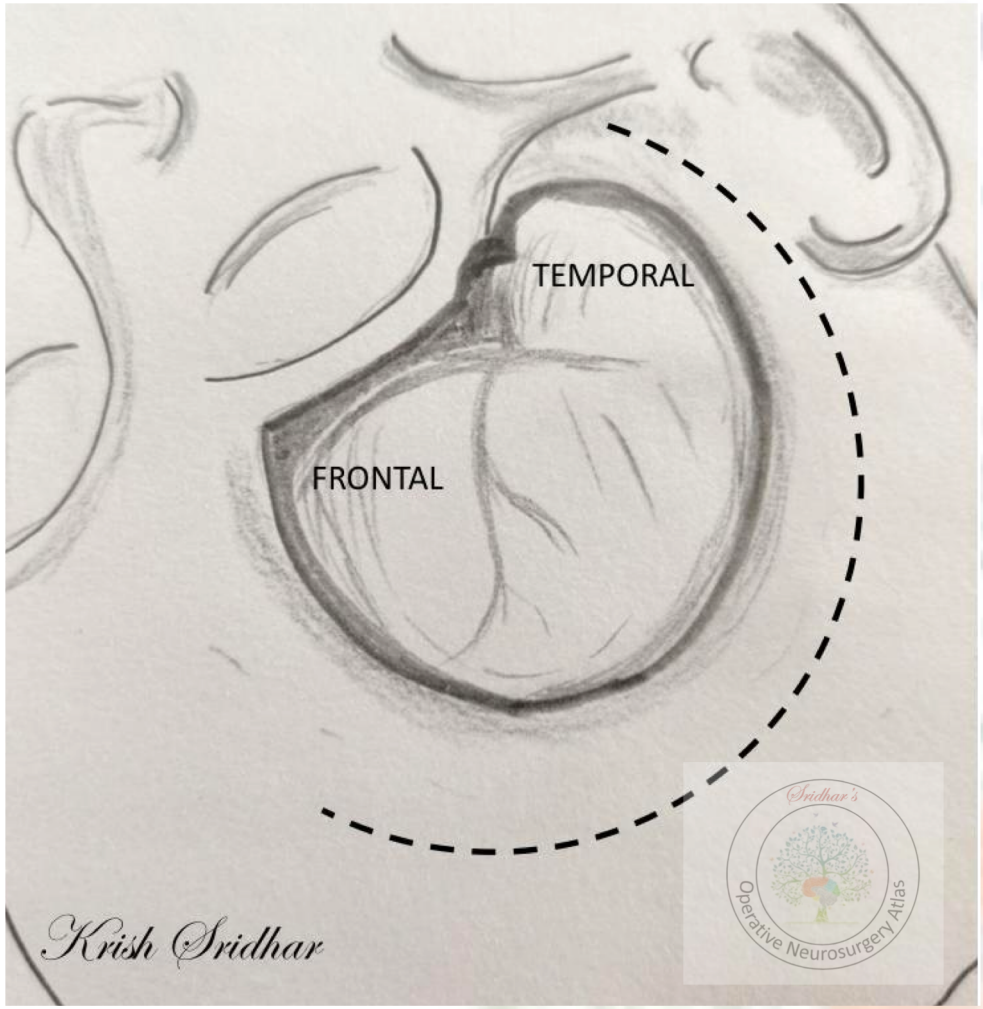
43yrs female,
Sudden onset of headache followed by loss of consciousness for 10min
taken to a nearby hospital, where her Bp was 190/100.
No history of seizure
Not k/c/o DM /HTN
O/e conscious, oriented
Gcs e4v5m6
Pupils b /l 3mm rtl
No focal deficit
Neck stiffness present

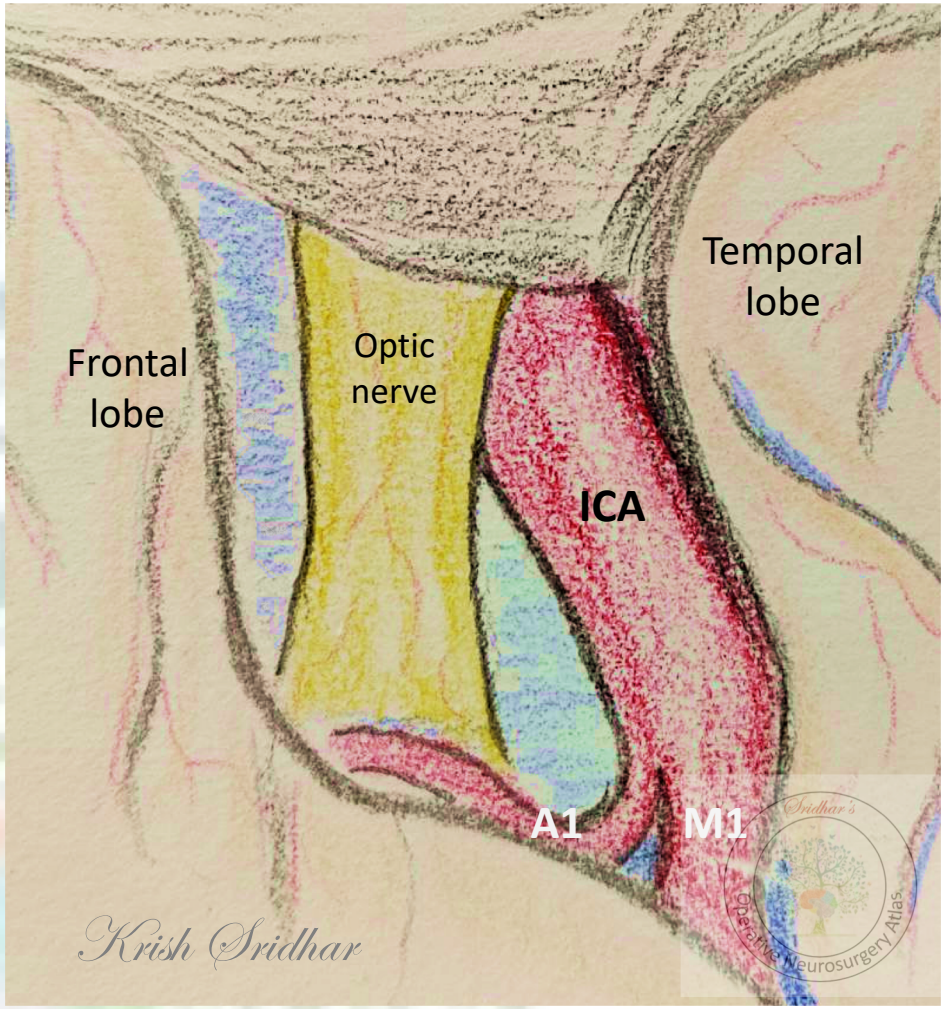




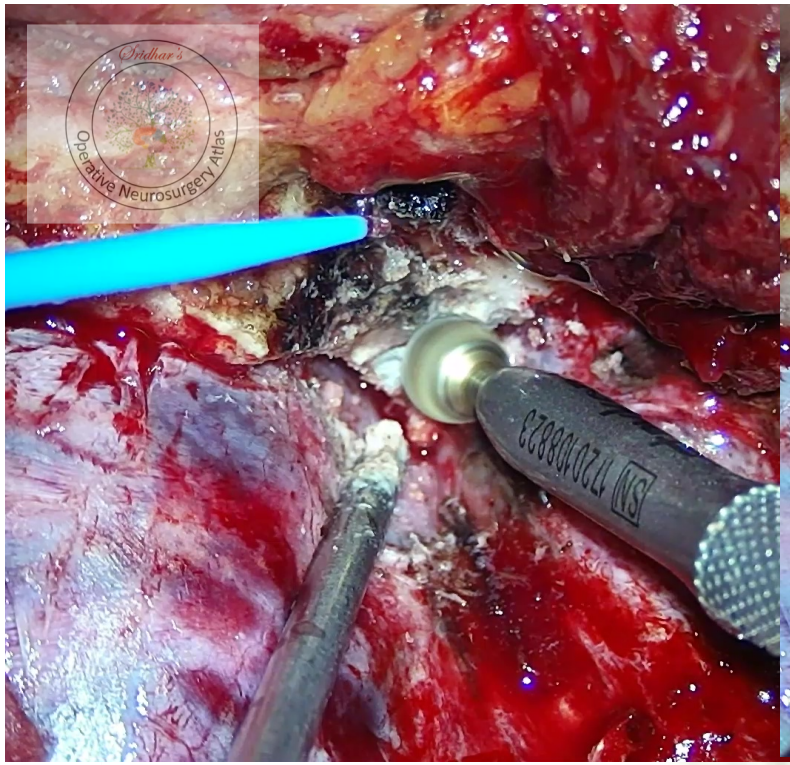
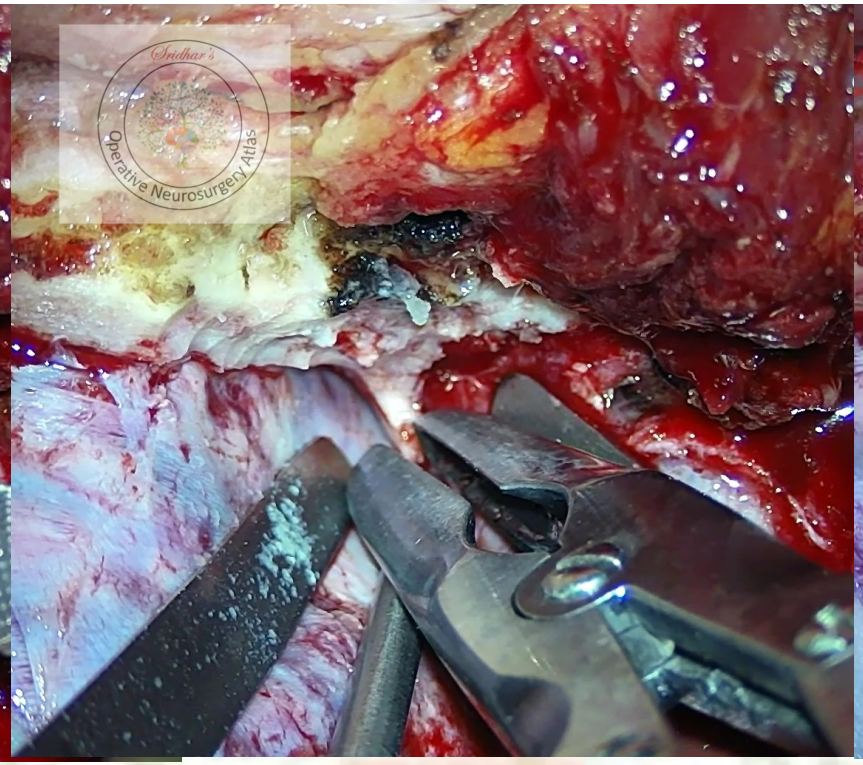
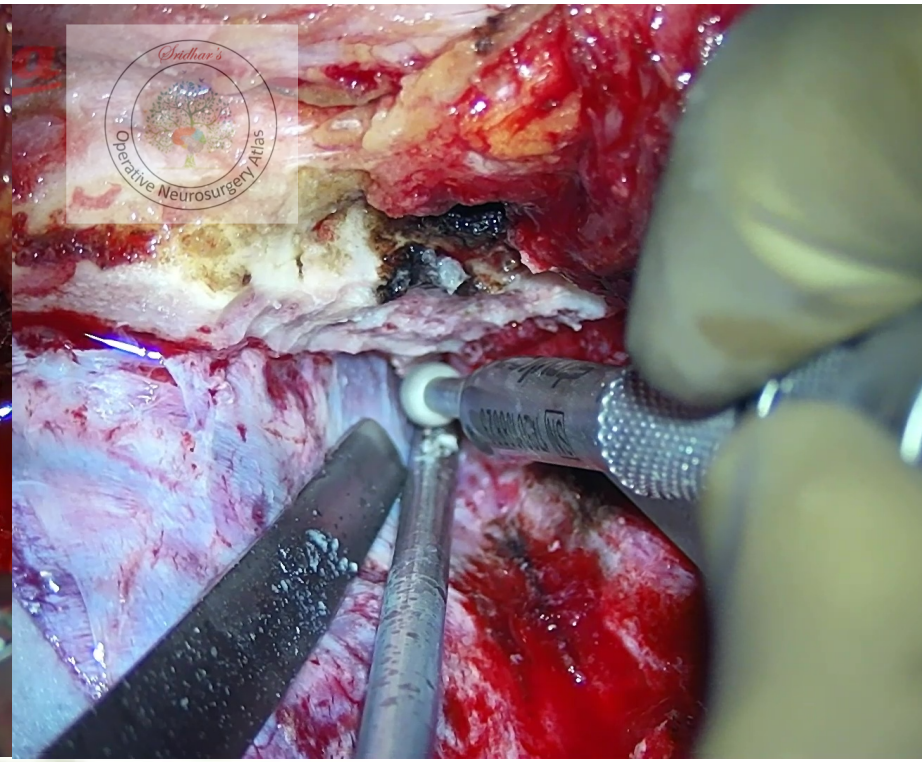
CT Angiogram shows a posteriorly pointing saccular aneurysm (arrowhead) at the Right ICA bifurcation

A classic pterional craniotomy is planned
Head fixed in a Sugita fixation system
The Malar eminence is highest and should be parallel to the floor
Single key burr hole used

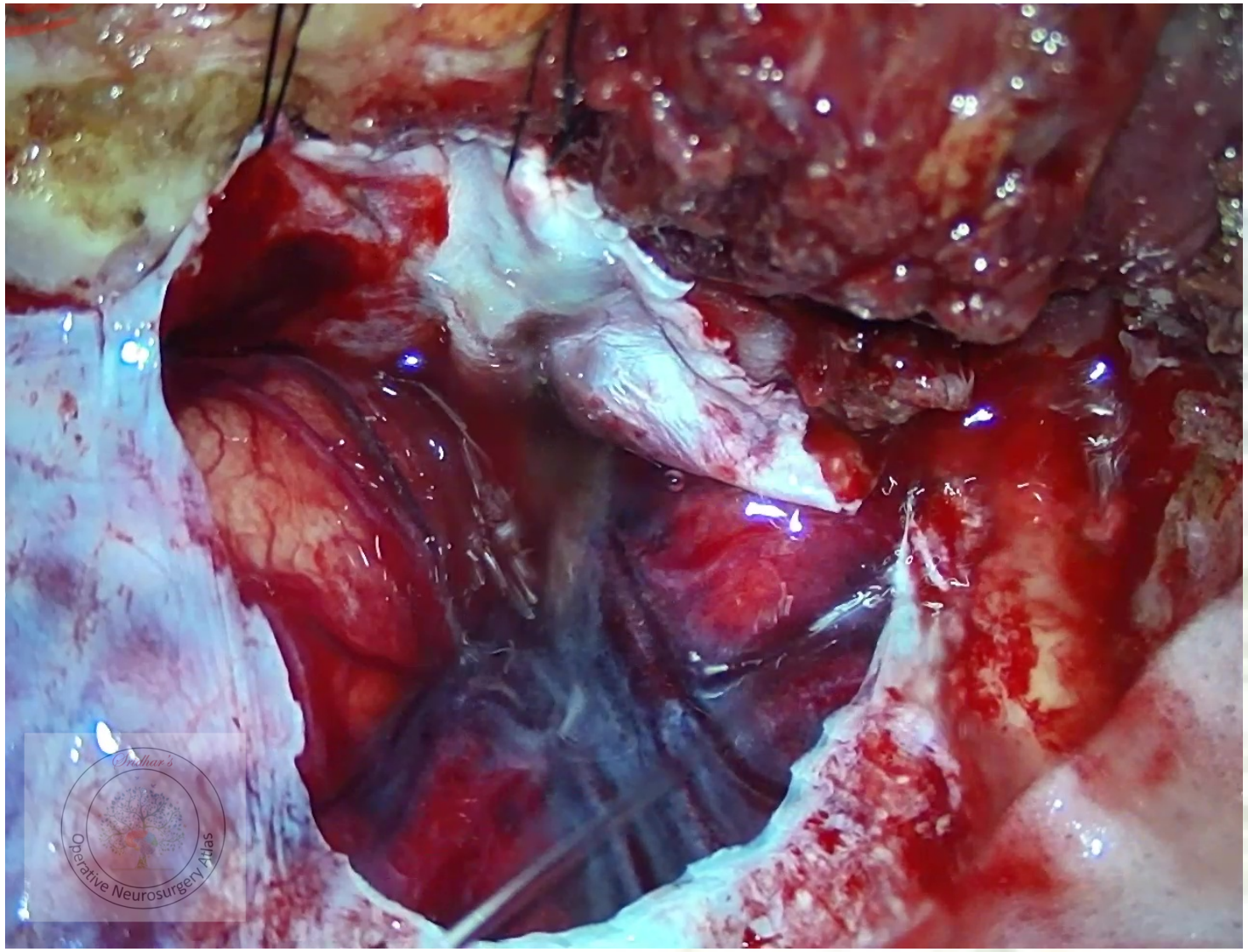




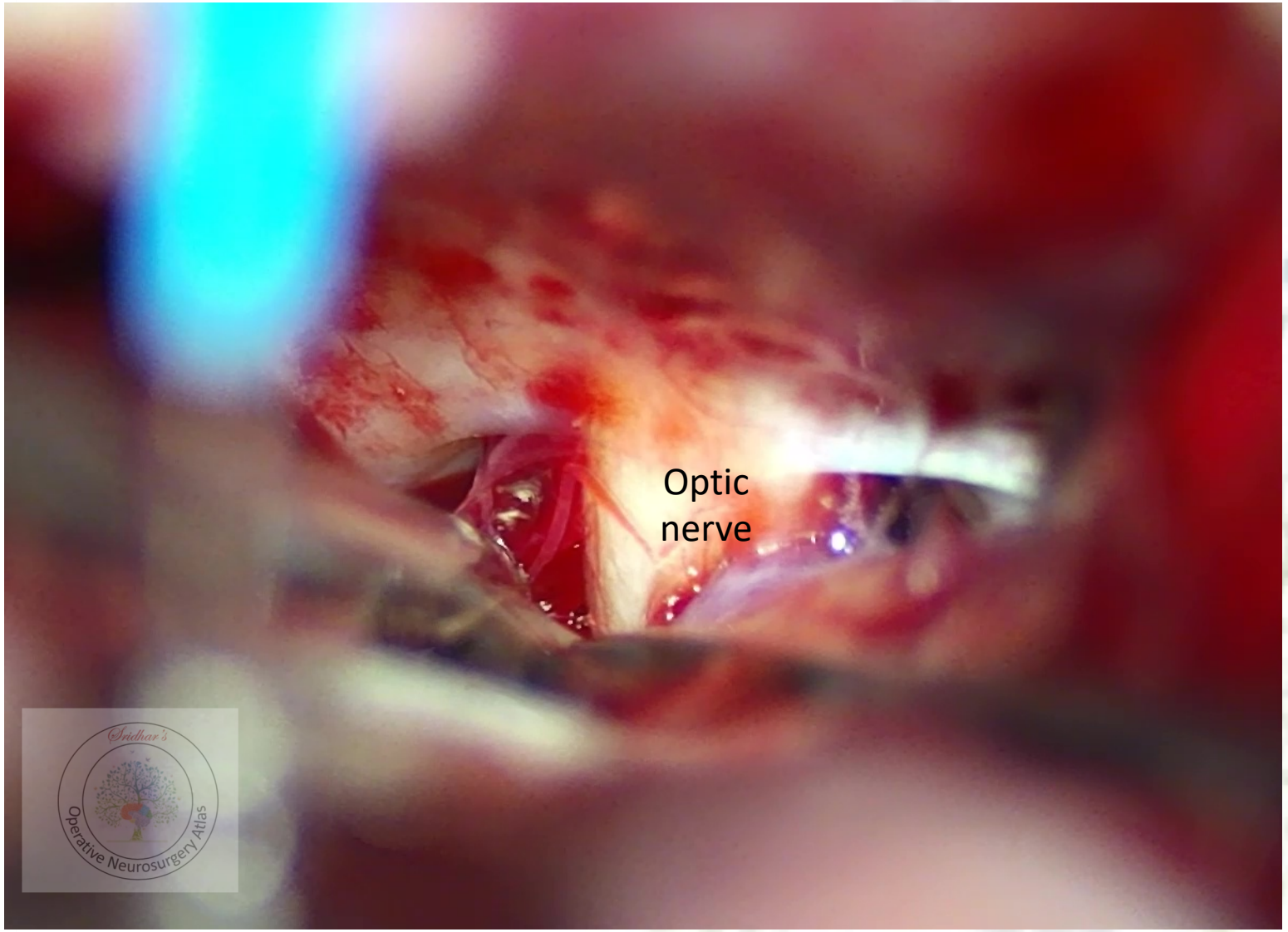
Diagrammatic representation of the classical right Pterional Craniotomy and the anatomy on dural opening and splitting the Sylvian Fissure.

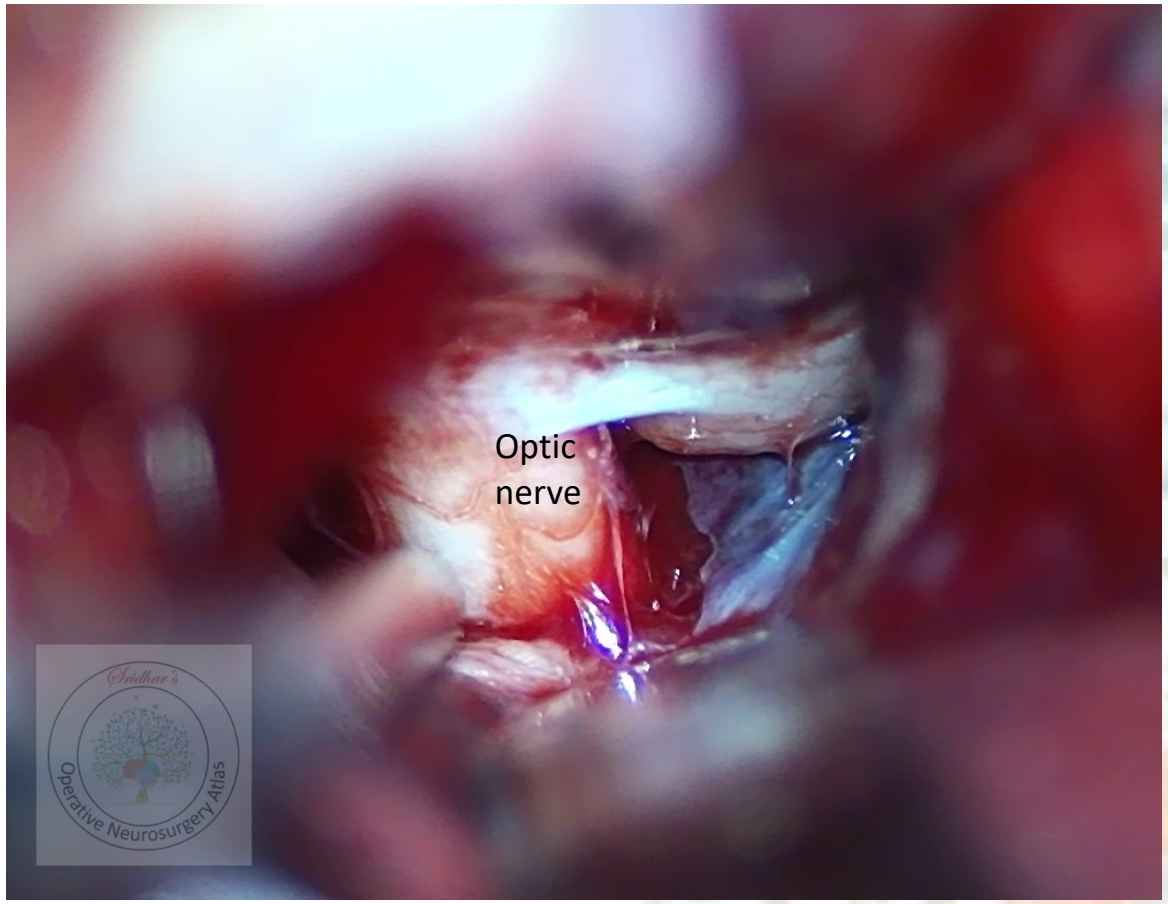
The Lesser wing of Sphenoid is drilled flush with the Anterior cranial Fossa base.
The ridge of the LWS needs to be taken off as far medially as possible in order to get a good exposure of the intradural proximal ICA, without much retraction of the brain. This is done by alternate dissection of the dura off the bone followed by use of rongures and a diamond drill

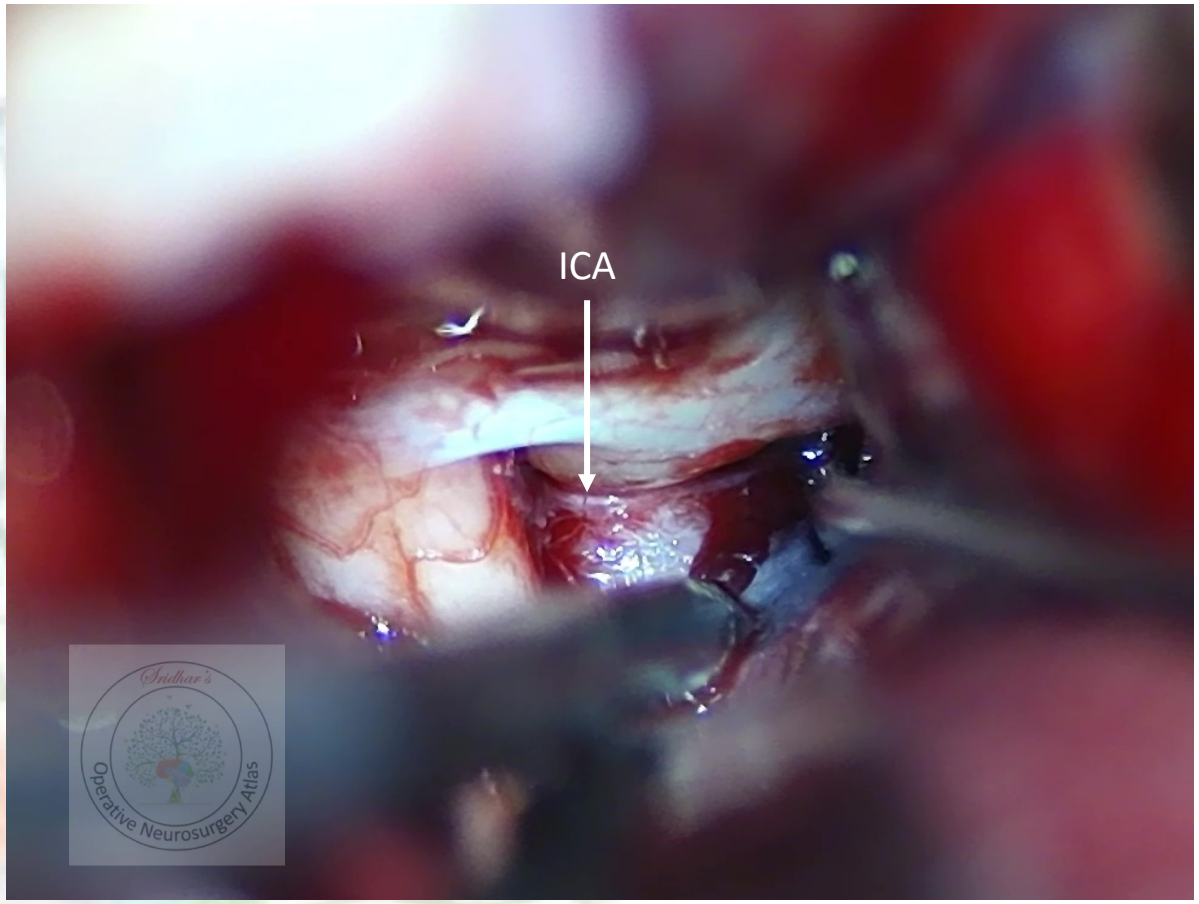


The Dura is opened as a flap towards the base

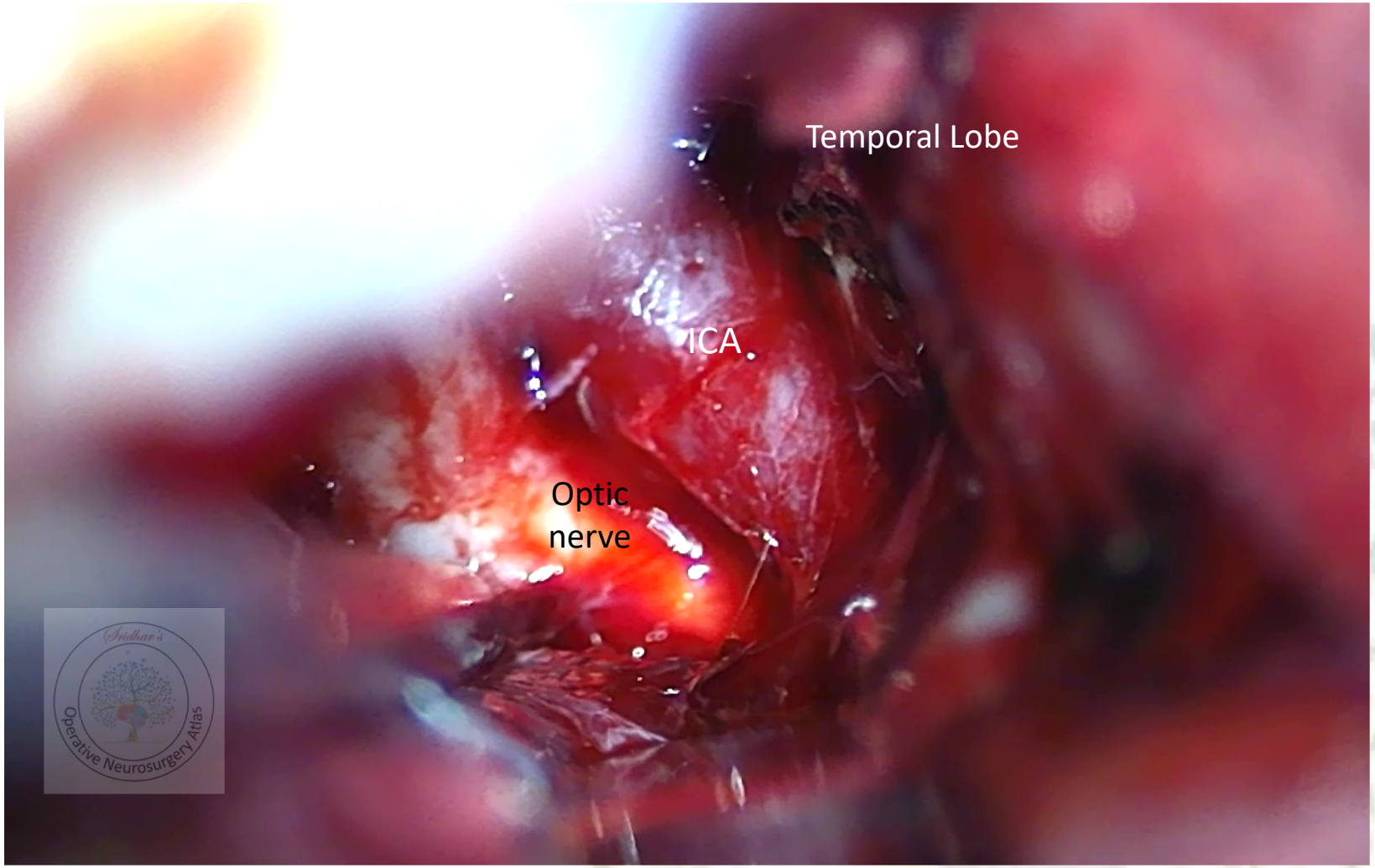


The Frontal lobe is gently retracted to expose the right Optic nerve. The arachnoid over the nerve is opened and the cistern cleared of any blood

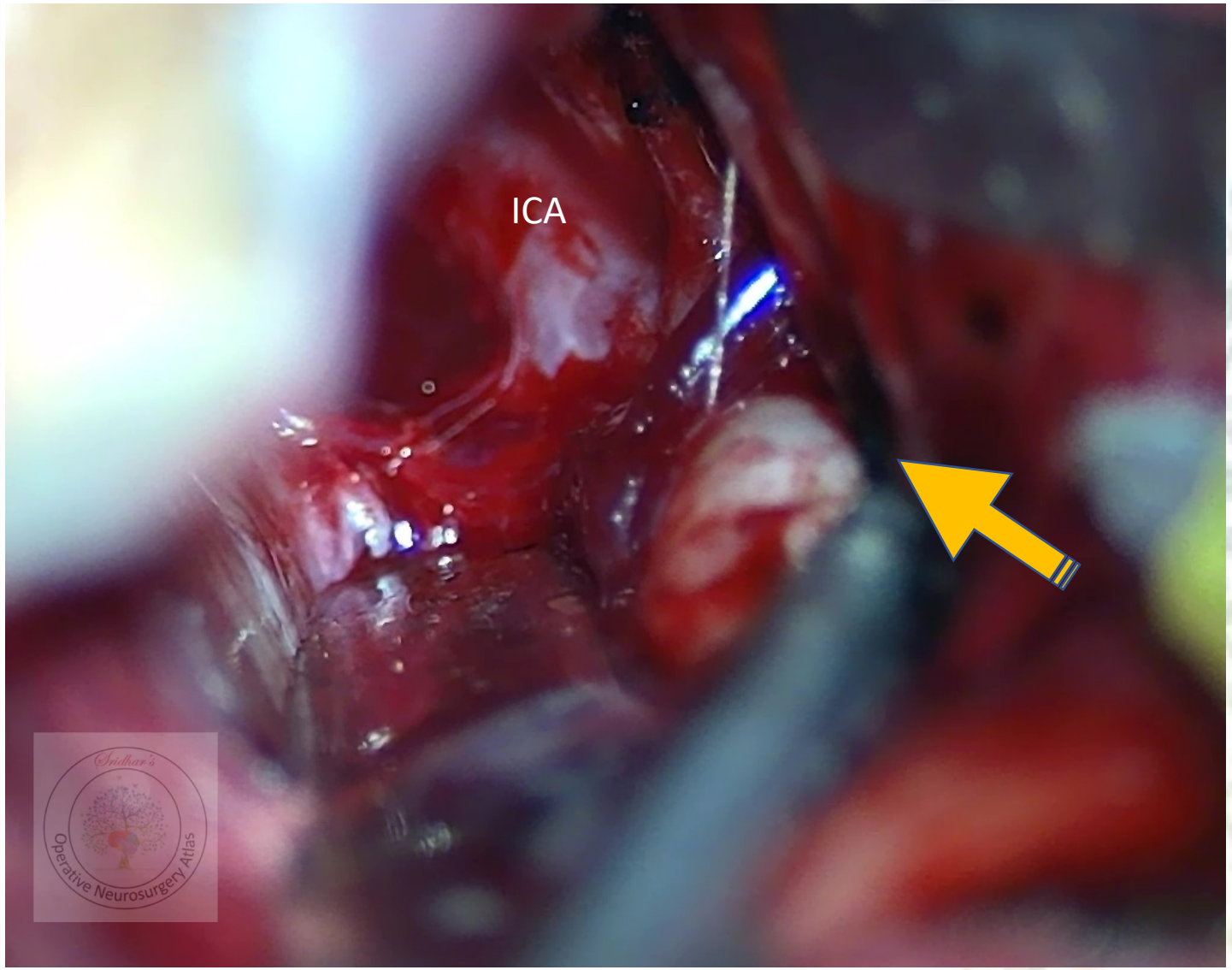




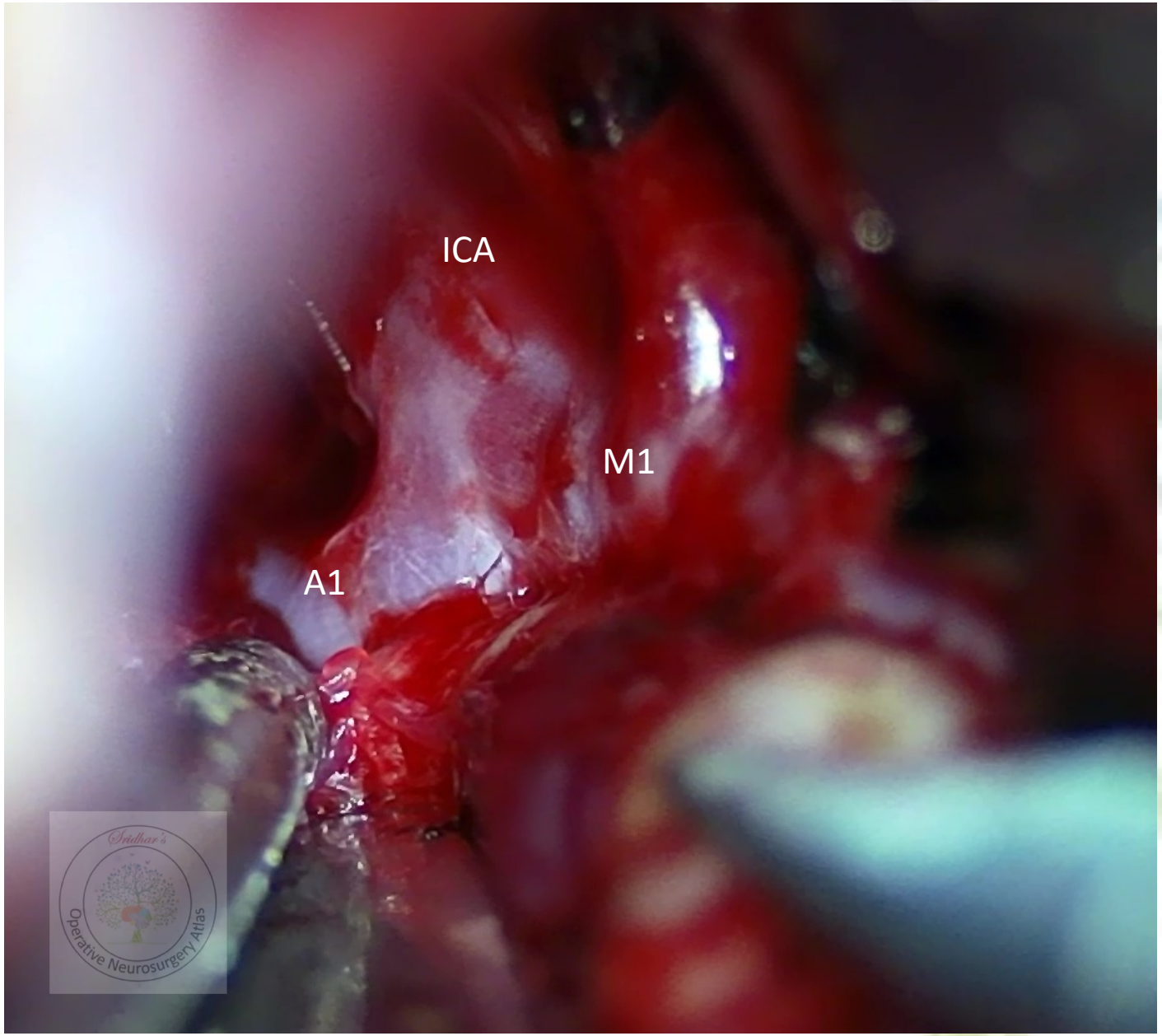
The Microscope is then directed laterally to open the arachnoid of the Carotid cistern, and clear the blood from the cistern to expose the ICA



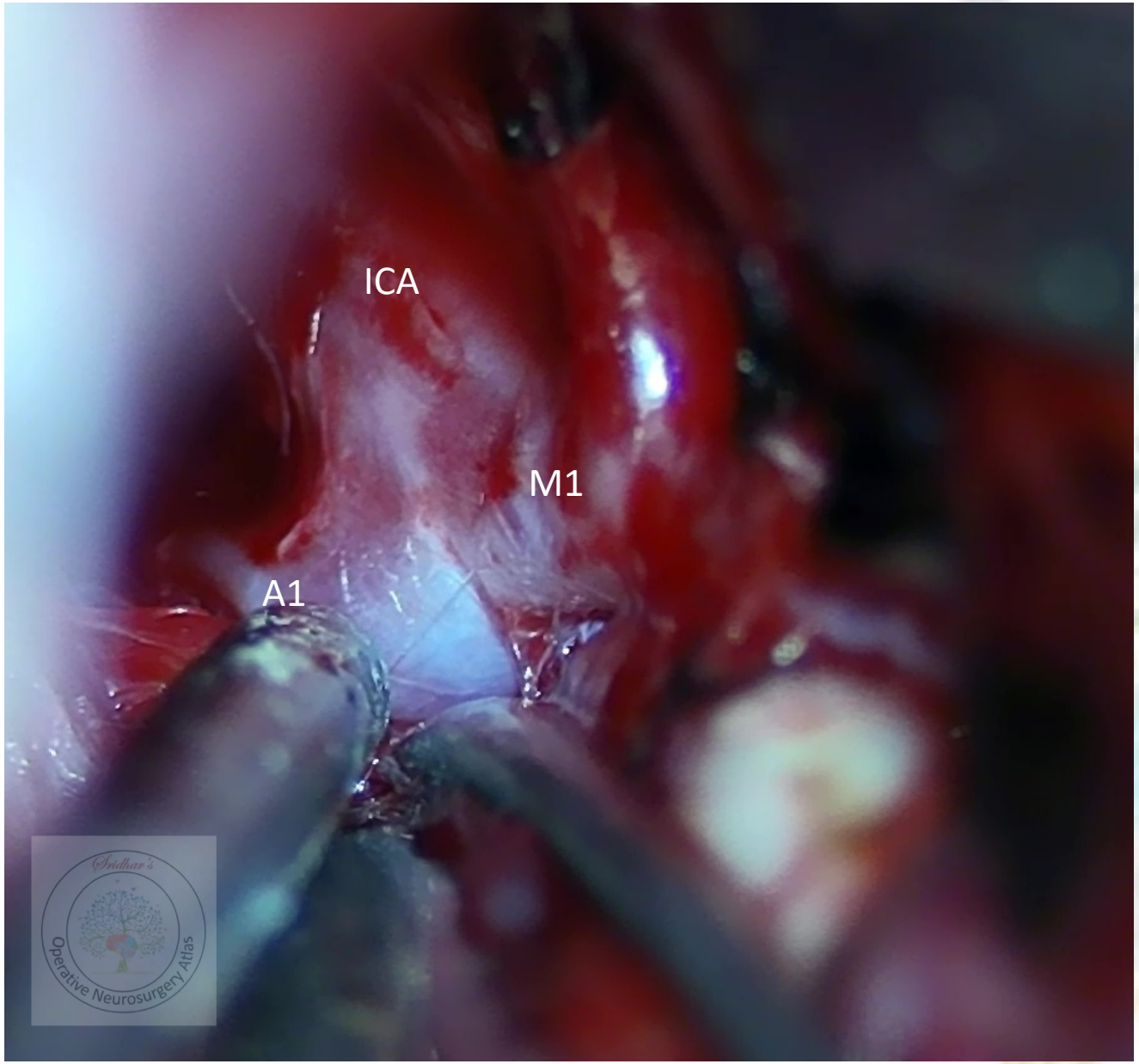
The ICA is followed backwards, clearing the blood in the cisterns as one progresses distally towards the bifurcation



The Lateral Sylvian Fissure (Yellow arrow)is then opened to allow the Frontal and Temporal Lobes to fall apart exposing the ICA bifurcation

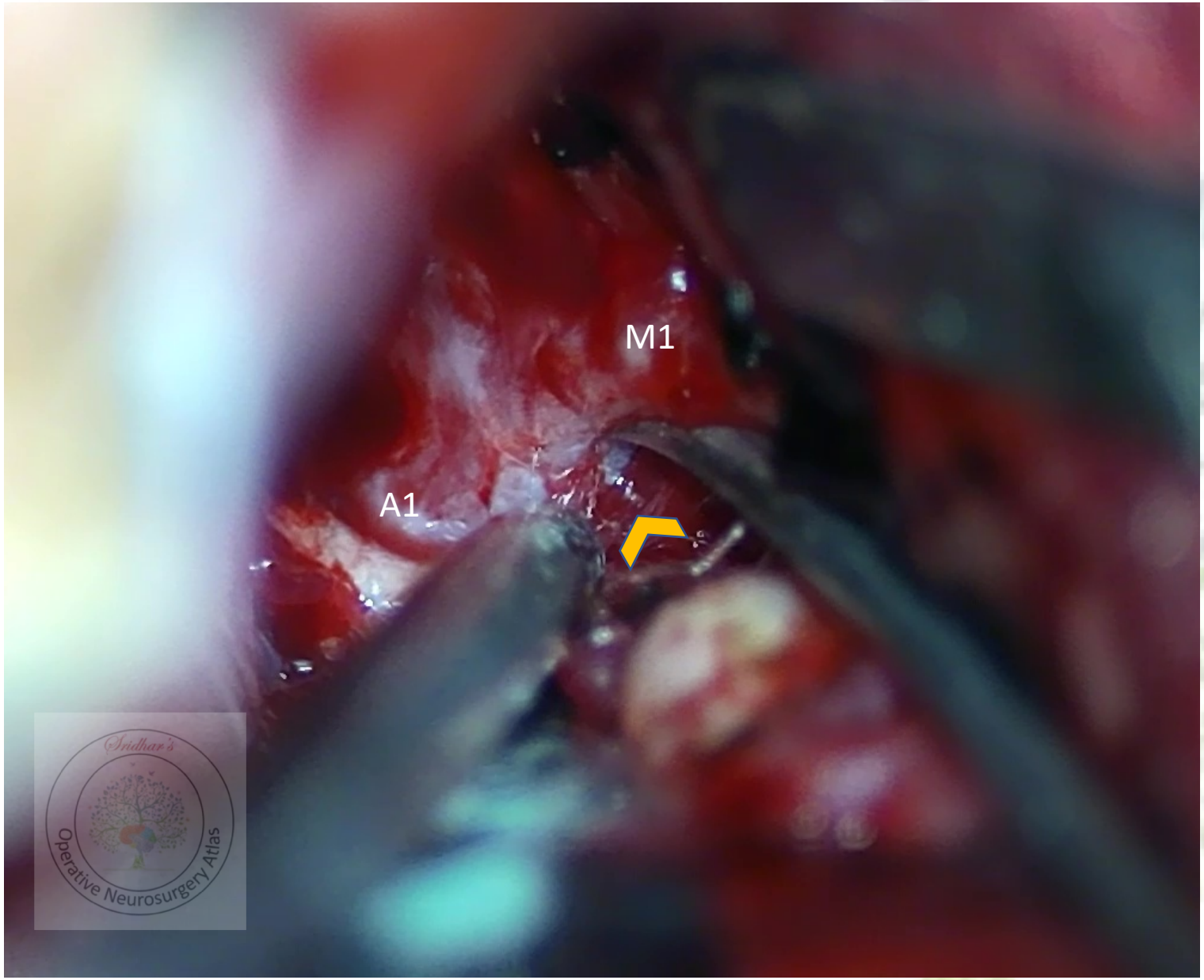


The ICA bifurcation, covered in clot, is exposed.
The dissection is taken along the A1 and the proximal M1

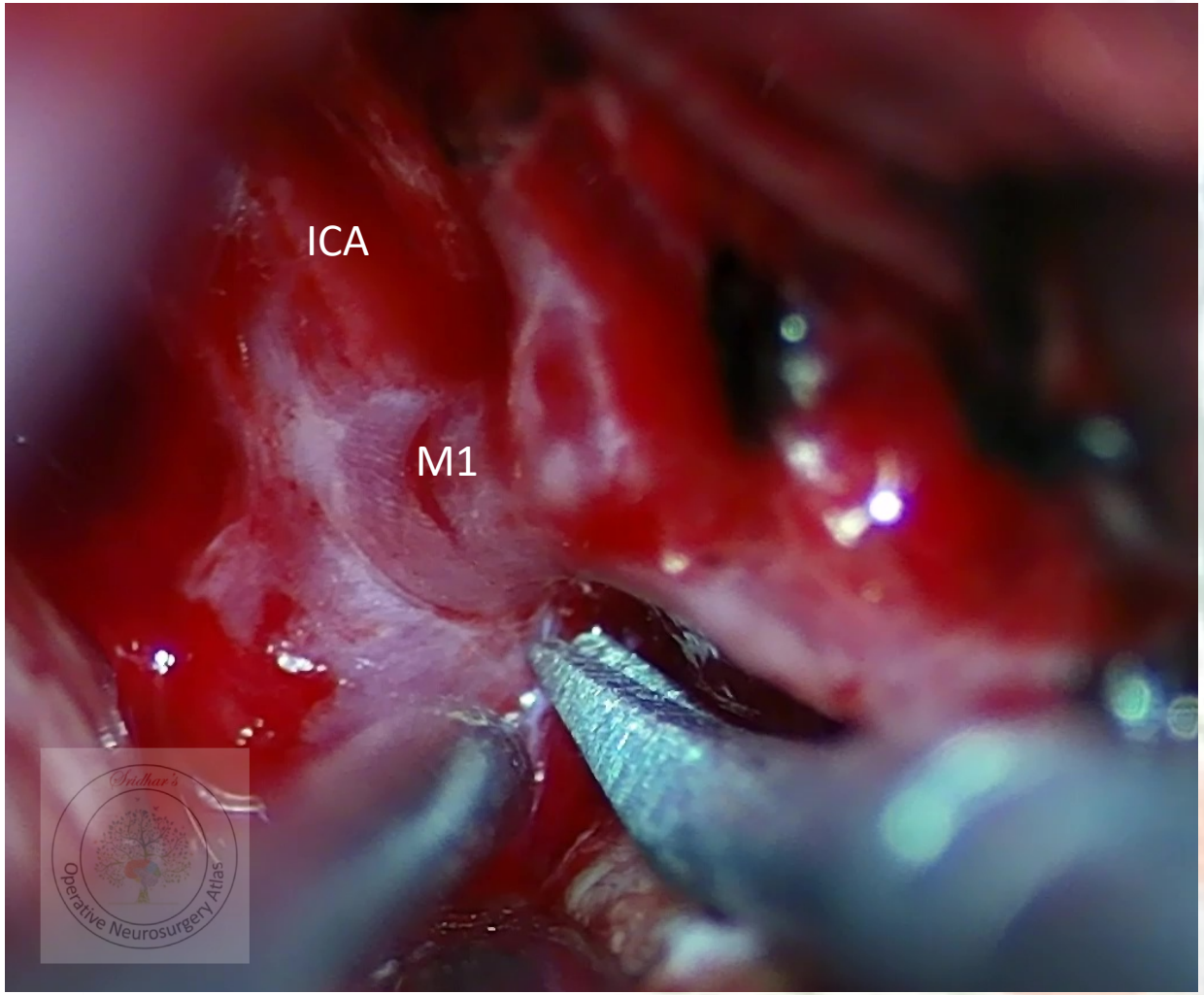


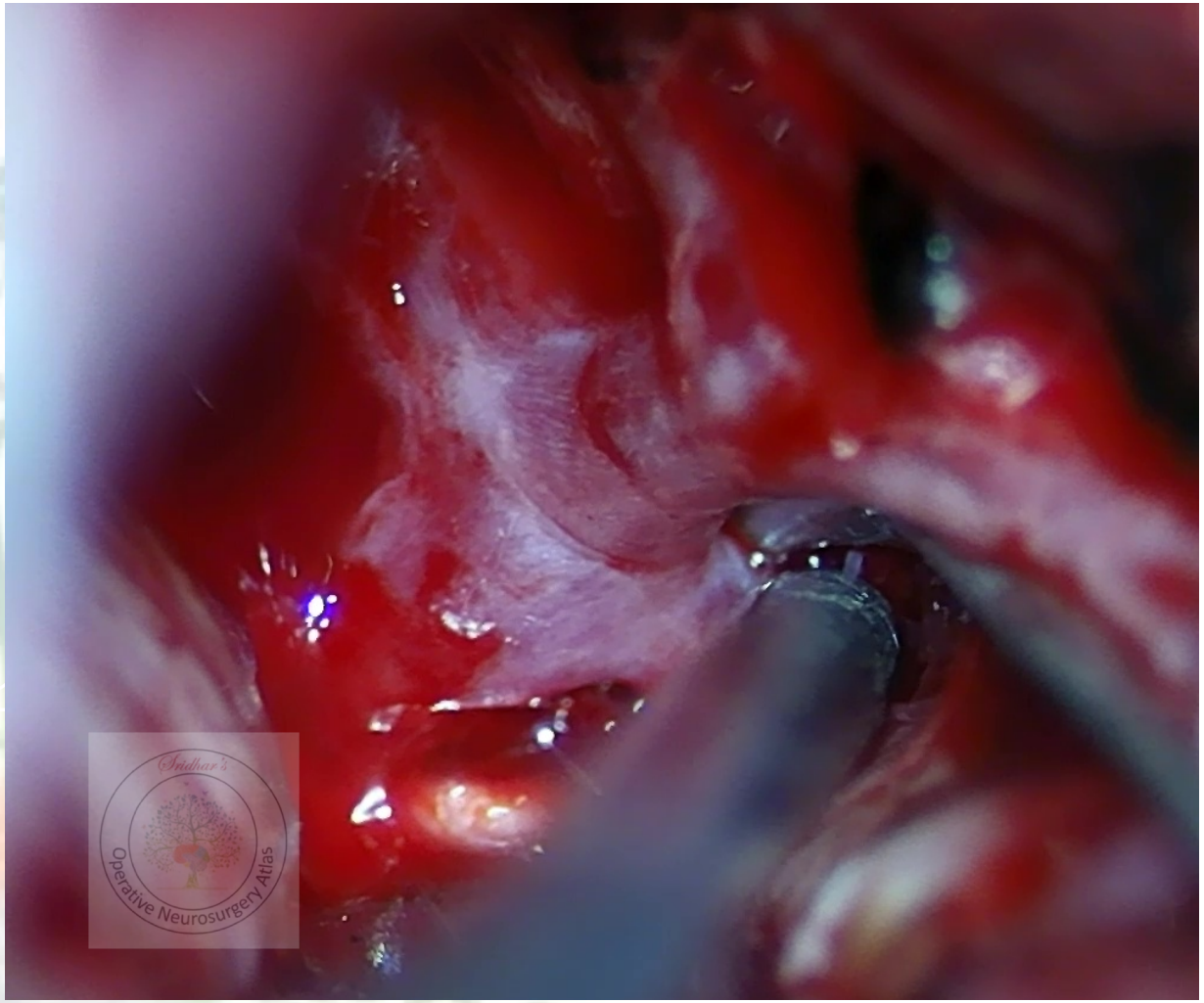
The ICA bifurcation and the proximal A1 and M1 segments are exposed.

The dissection then goes along towards the supero-posterior wall to expose the neck of the aneurysm

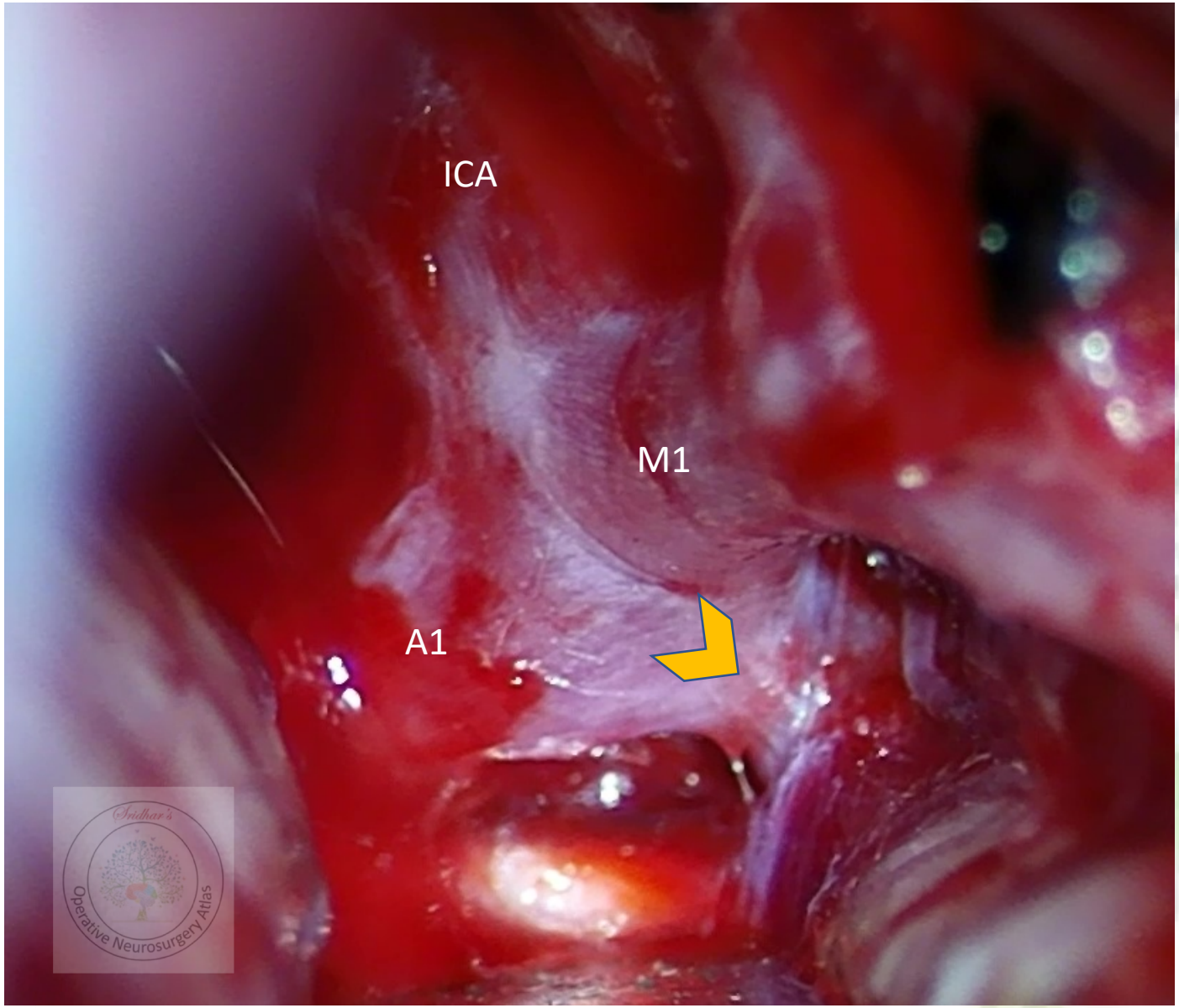


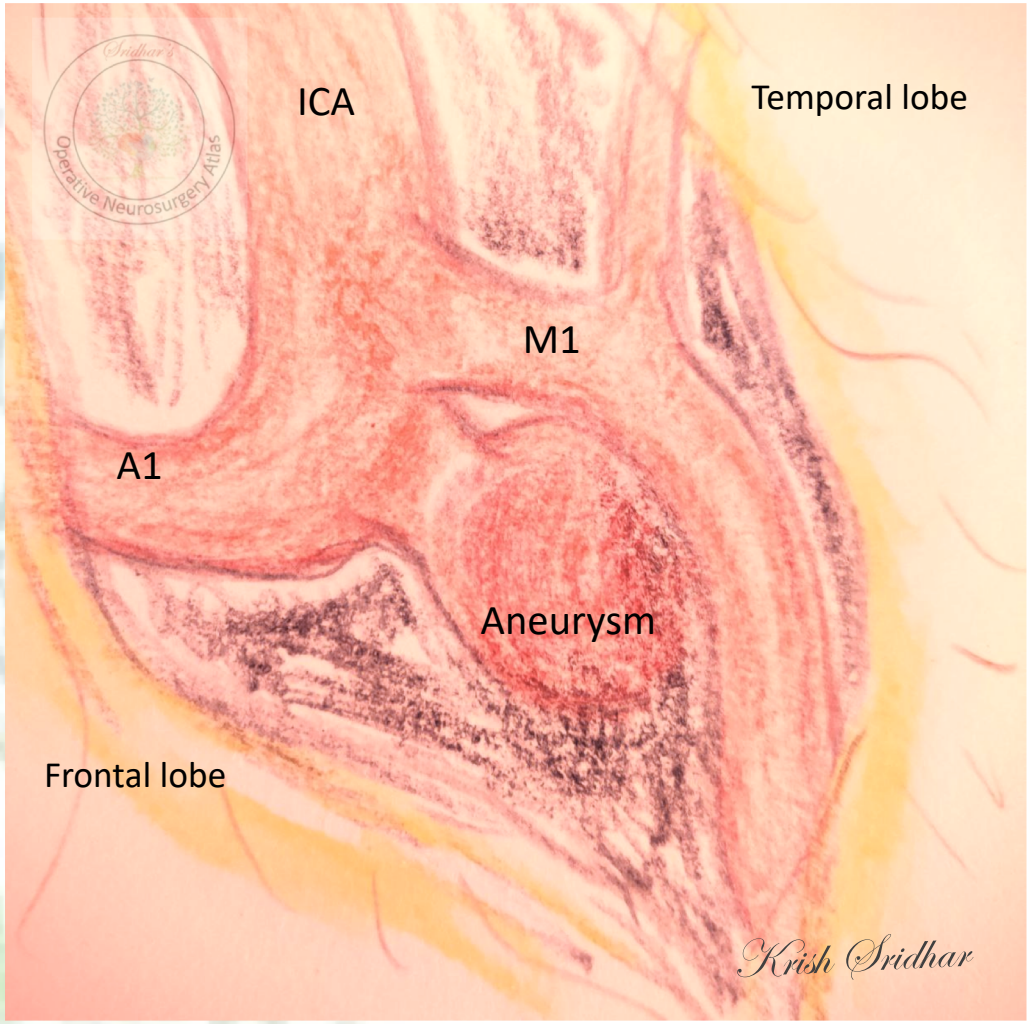
Dissection of the neck of the posteriorly pointing aneurysm (arrowhead)



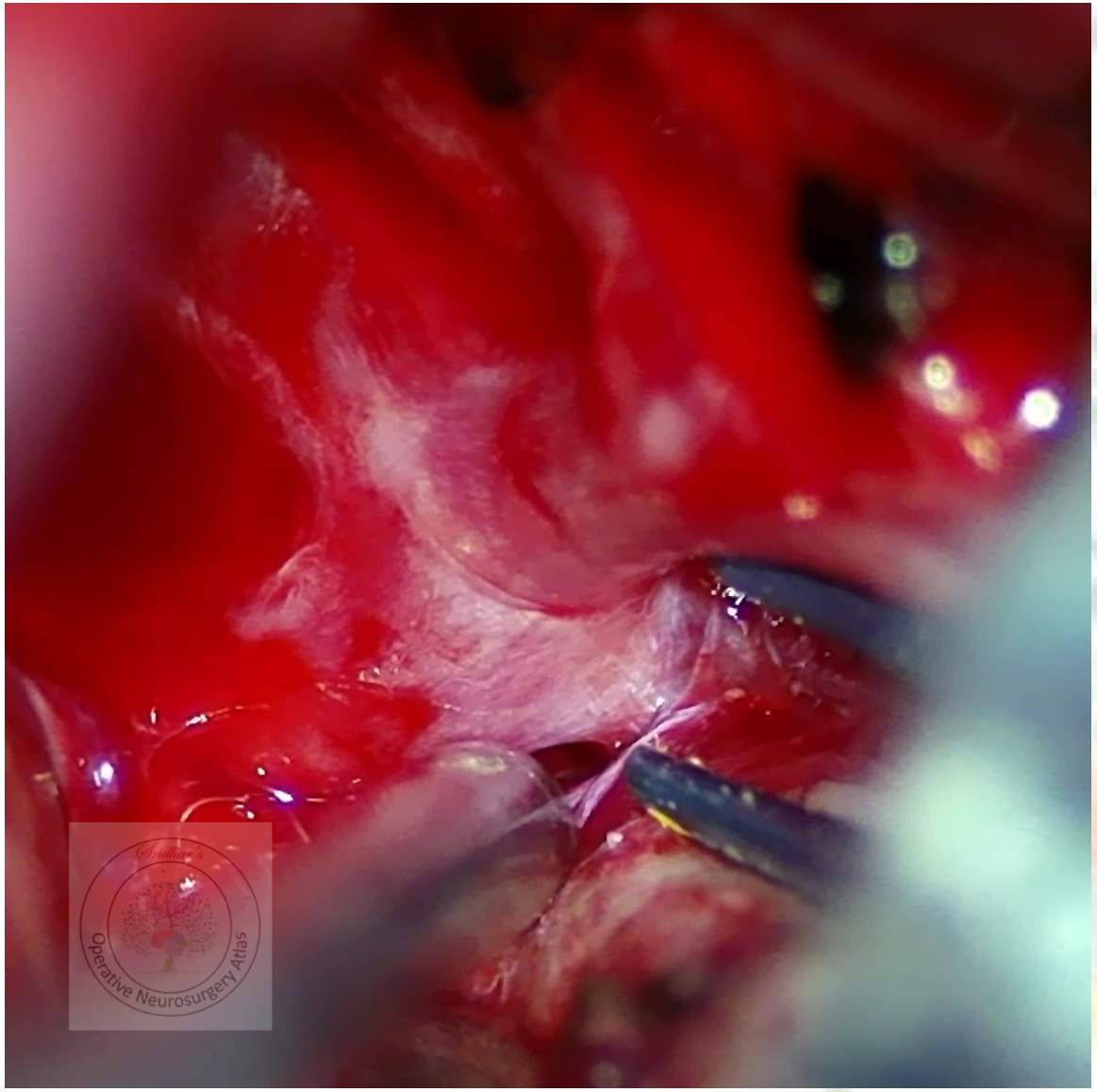


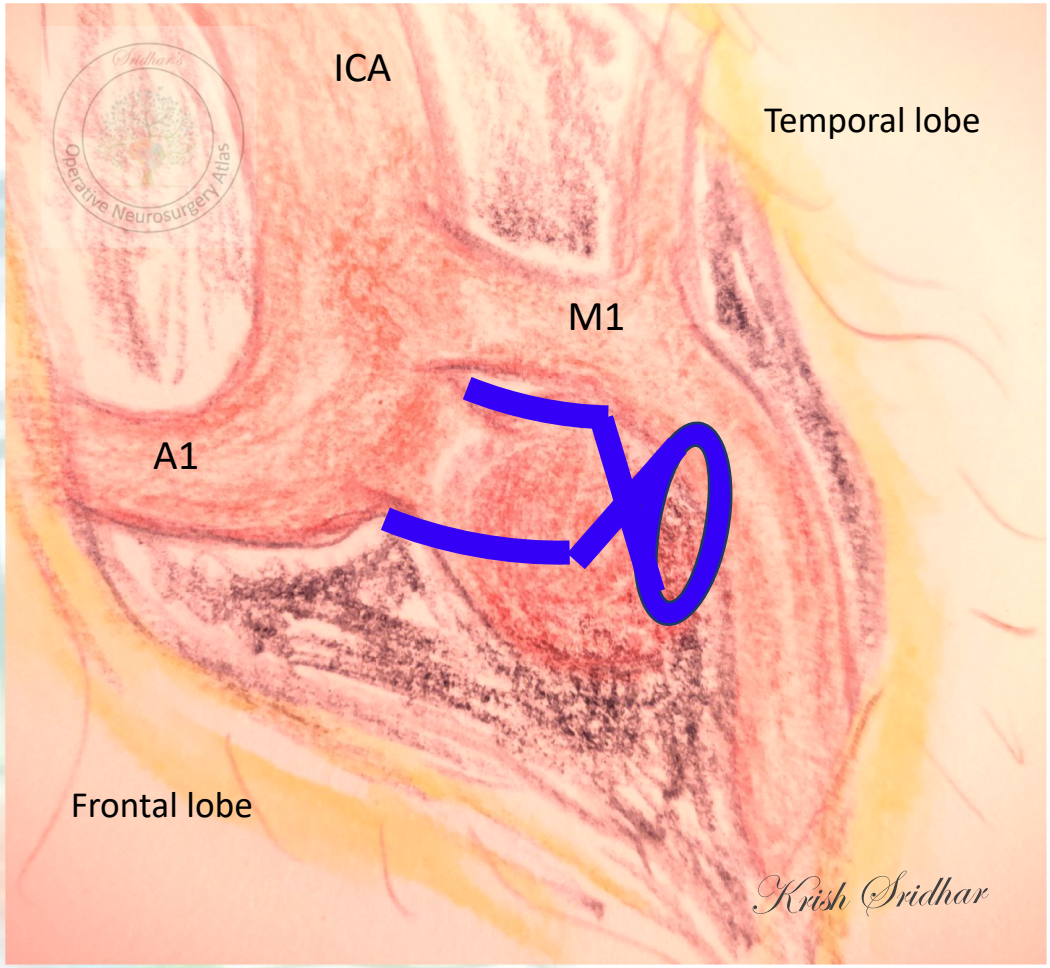
Dissection of the neck of the aneurysm starts under high magnification



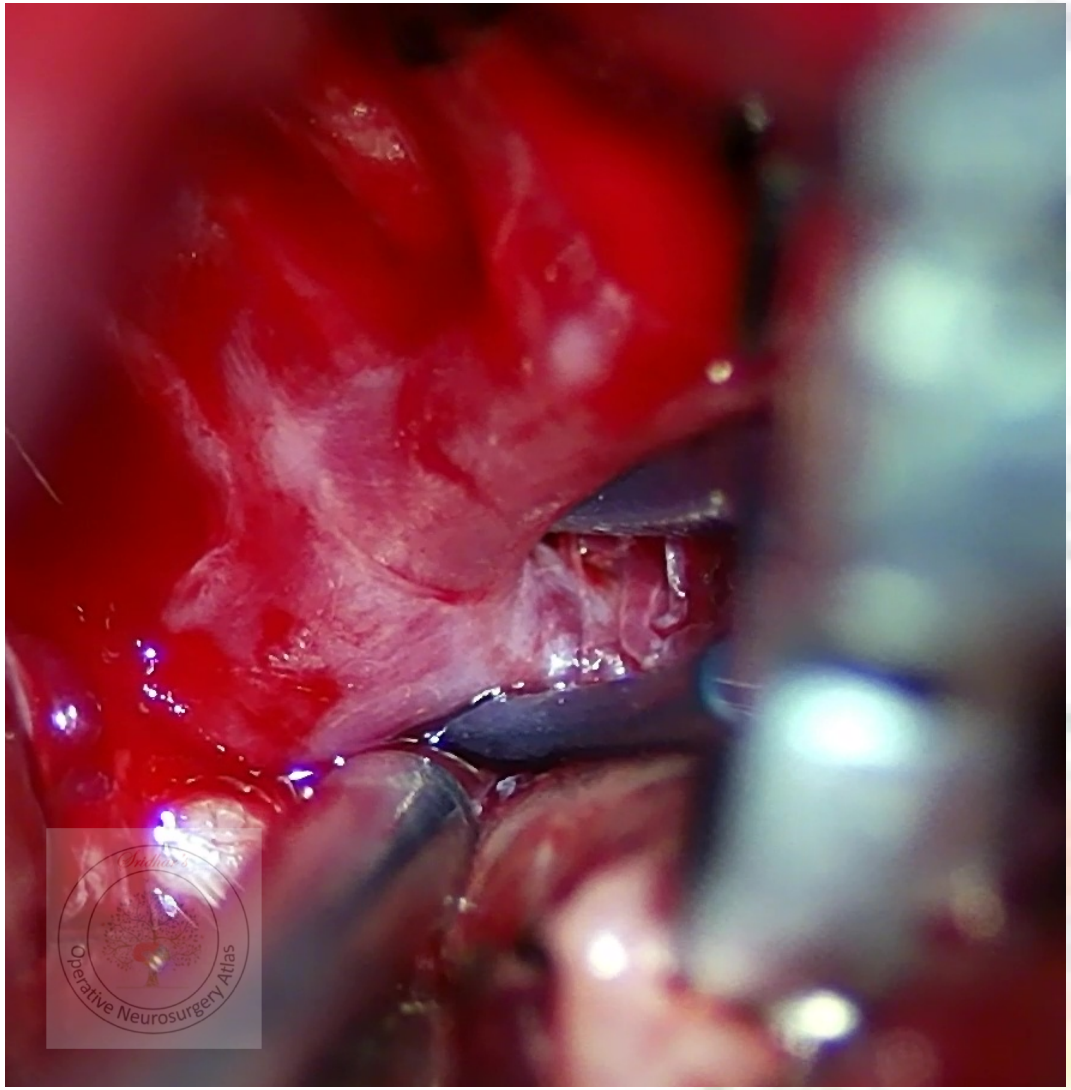


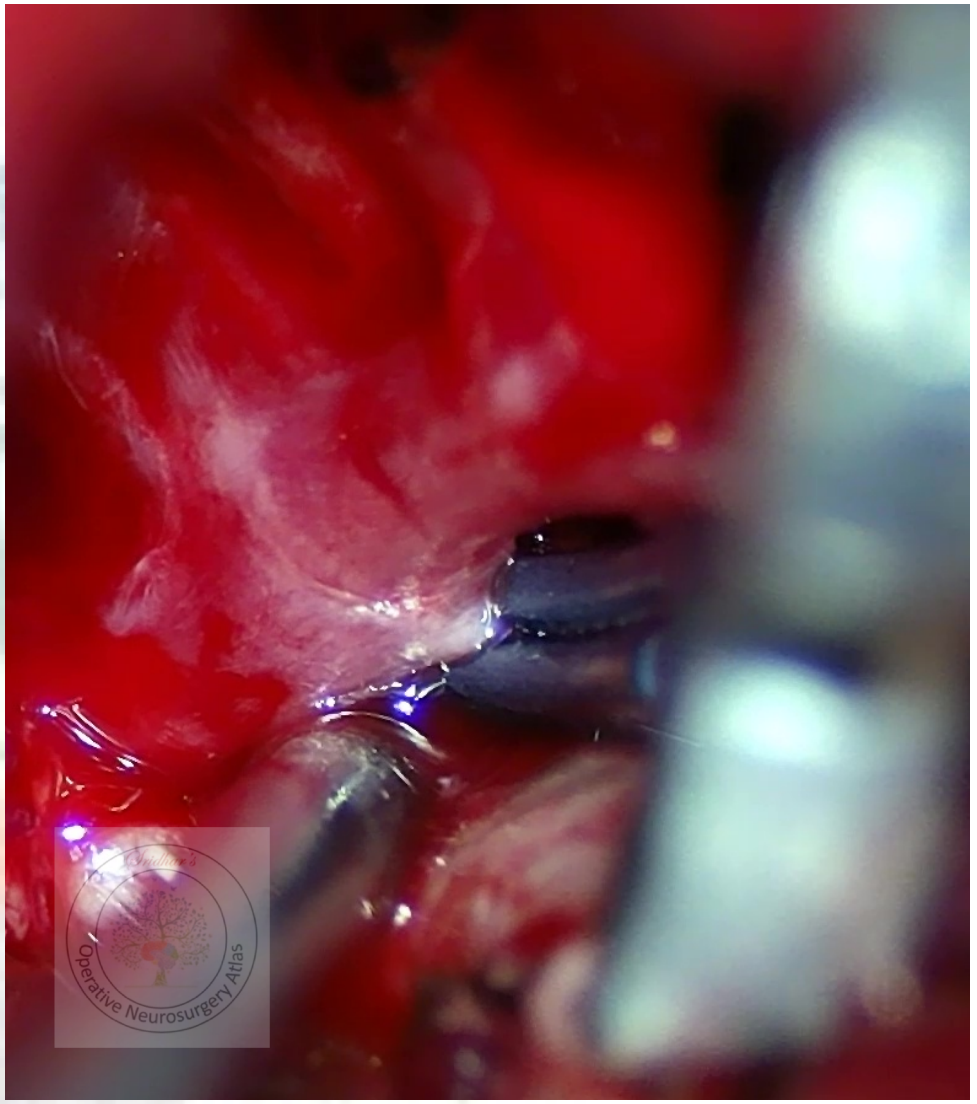
The anatomy of the aneurysm (Arrowhead) dissected



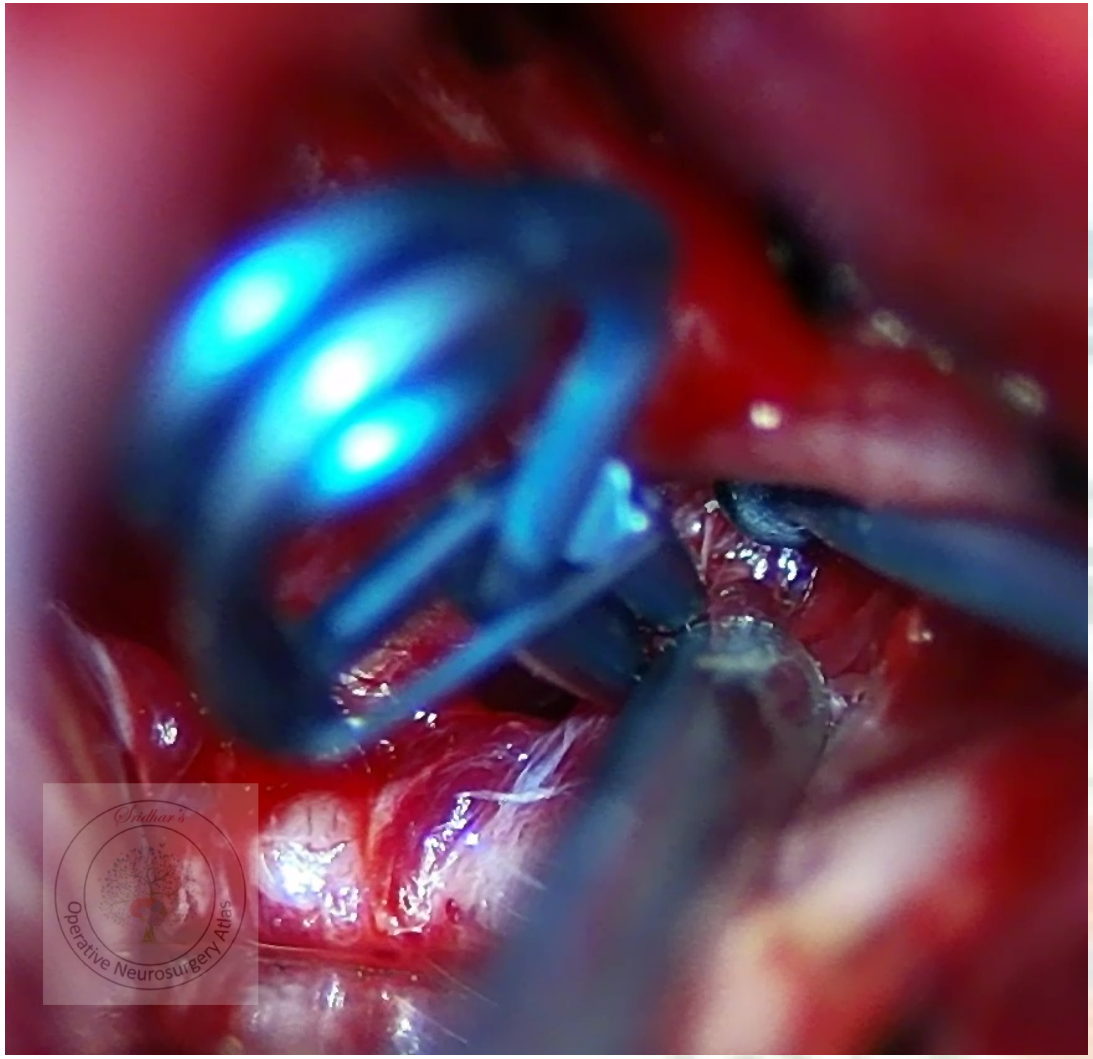


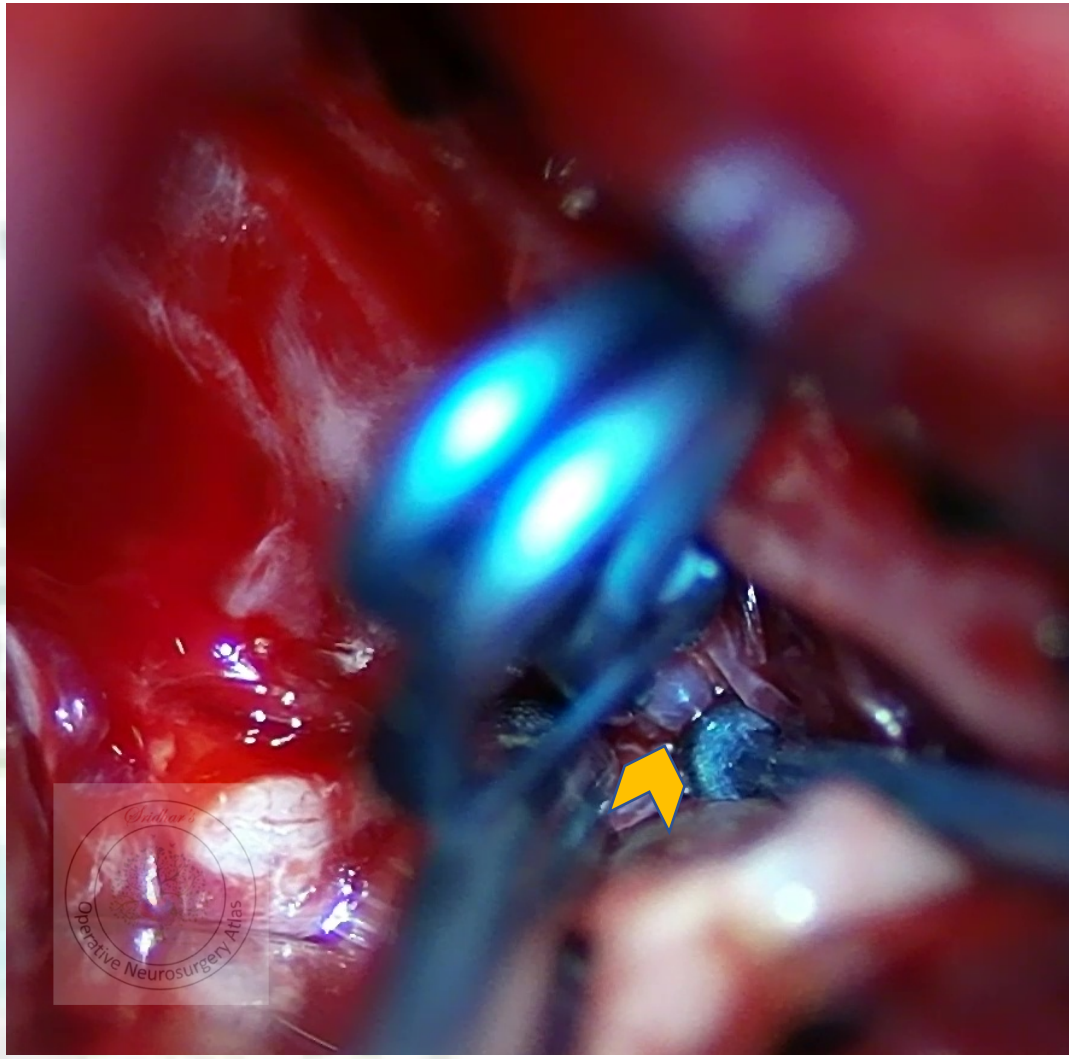
A curved 7mm clip is used to clip the aneurysm, ensuring the blades are in the right direction, running along the surface of the neck of the aneurysm



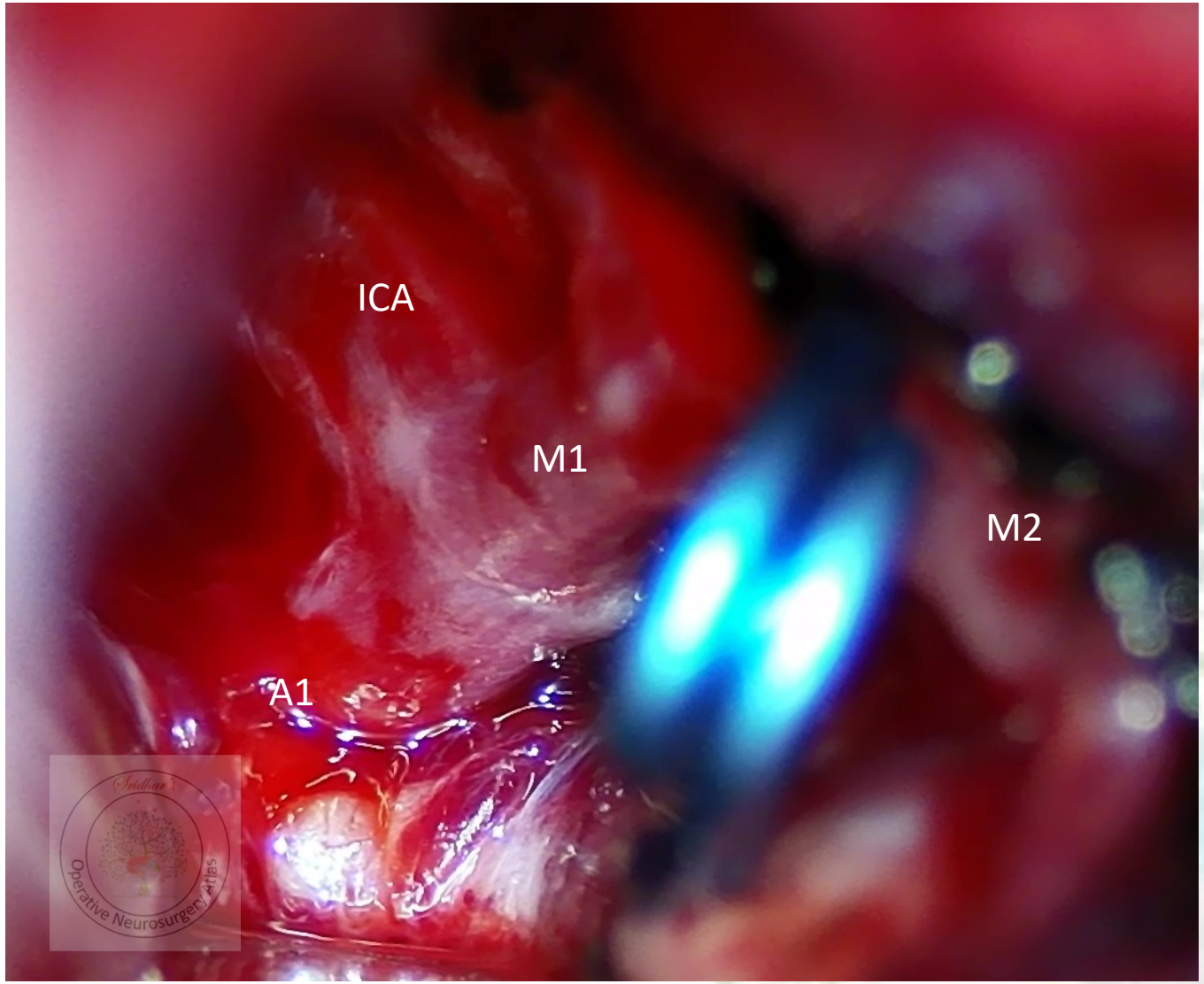


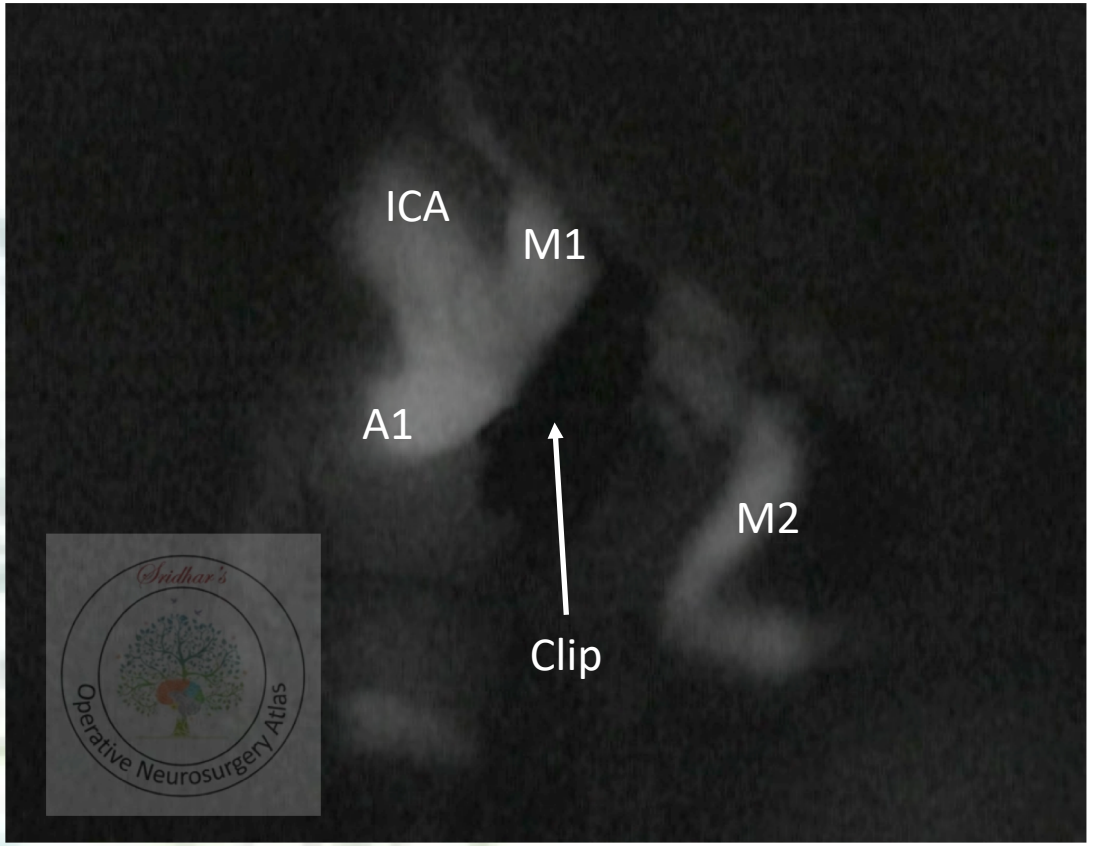
Final Clip positioning done and clip is deployed to secure the aneurysm



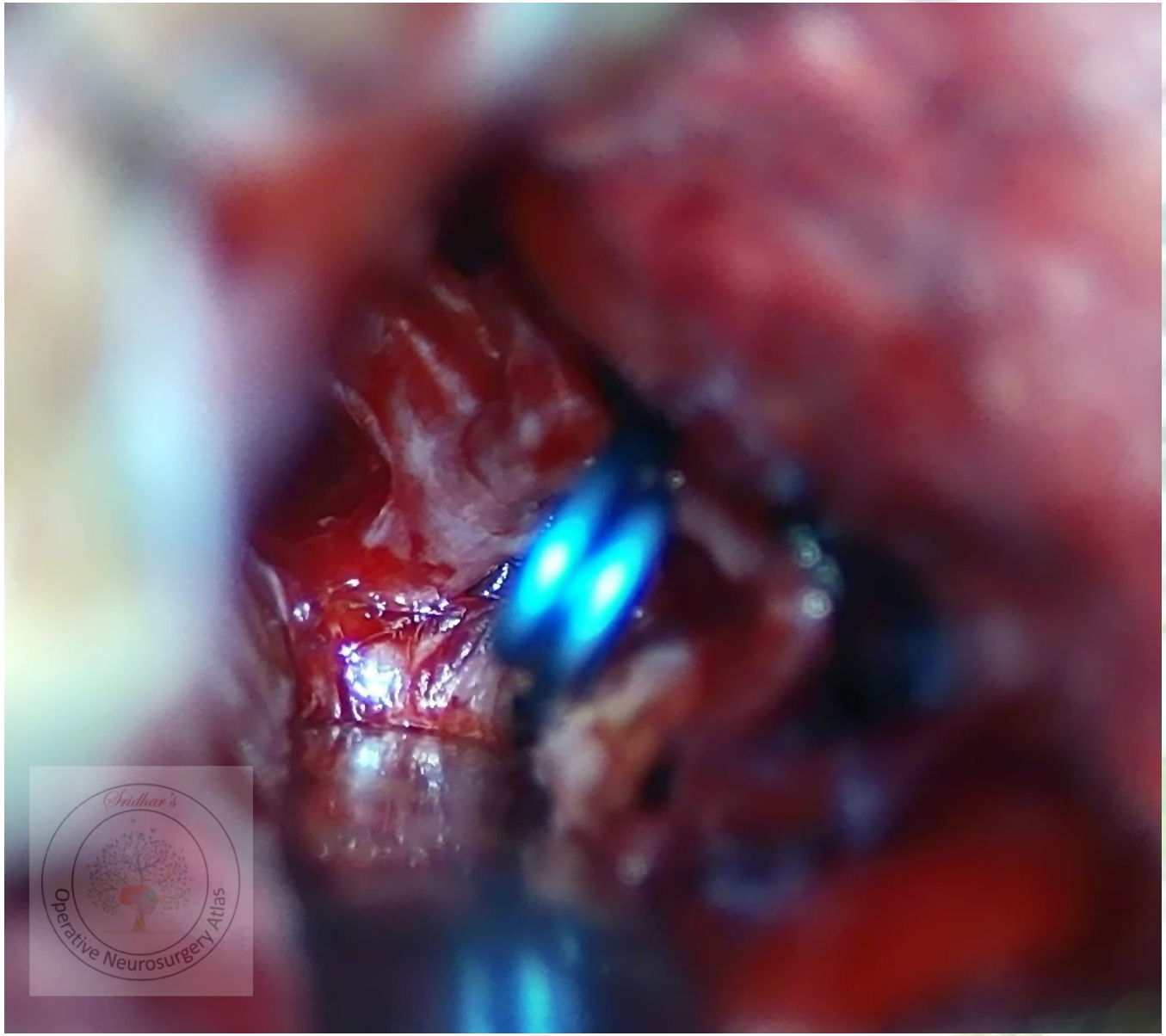


A check is done all around the neck of the aneurysm to ensure proper and complete clip application, that the none of the perforators are included in the clip.
The fundus of the aneurysm (arrowhead) is also dissected free from the surrounding brain.





ICG Videoangiography is done to ensure proper clipping of the aneurysm as well as a good distal flow in the A1 and M1 segements of the ICA



Final View of the clipped aneurysm

Diluted Papavarine is instilled into the field to prevent spasm of the vessels due to handling

Learning Points

- Classic Pterional craniotomy
- Drilling of the Lesser Wing of Sphenoid as low down as possible
- Initial exposure of the ICA for proximal control
- Distal Sylvian Fissure opened to enable separation of frontal and temporal lobes
- Bifurcation is dissected and aneurysm neck isolated
- Proper clip chosen for clipping based on the neck and parent vessel
- Post clipping check done to ensure complete closure of the neck, and to ensure that perforators are not included in the clip
- Fundus dissected free
- ICG-VA for final check of complete and correct position of clip
- Dilute Papavarine instilled to prevent vasospasm


Sridhar's
Operative Neurosurgery Atlas