

NEVA VS CLINICAL CASES

Designed and Approved for VASOSPASM



NeviaTM VS

SEVERE VASOSPASM IMPROVED



Dr Rishi Gupta, MD, Wellstar Health, Atlanta, Georgia

“I believe NeVa VS will prove to be a more definitive alternative to balloon in these refractory post aSAH vasospasm cases.”

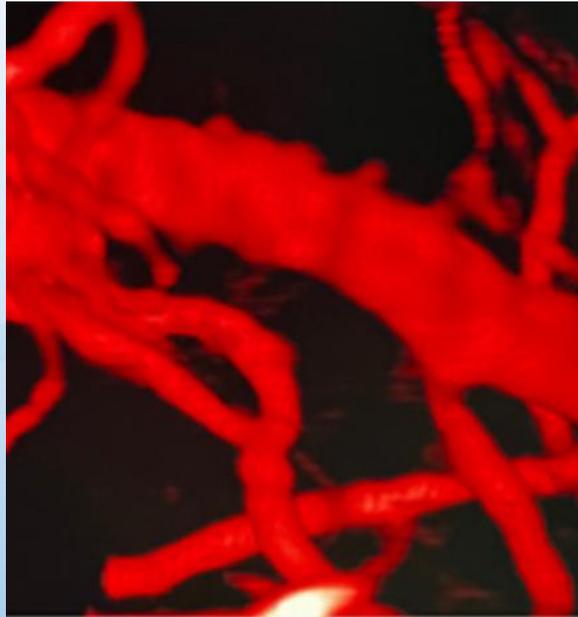
Pre NeVa VS

Severe vasospasm



Post NeVa VS

Narrowing improvement after NeVa VS deployment



OUTCOME

- No further endovascular treatment needed

BASILAR SEGMENT VASOSPASM TREATED DAY 18 POST-SAH

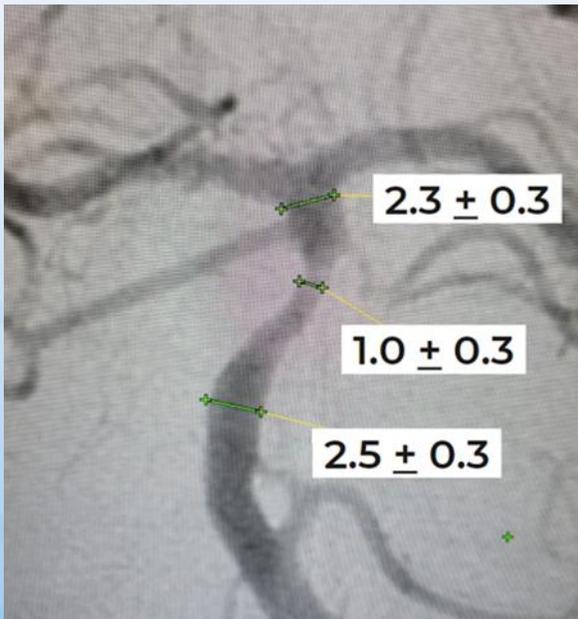


Dr Ameer Hassan, MD, Valley Baptist Neuroscience Institute, Harlingen, Texas

“Having NeVa VS on our shelf for severe vasospasm post SAH has proven to be a valuable tool for some of the sickest patients we see.”

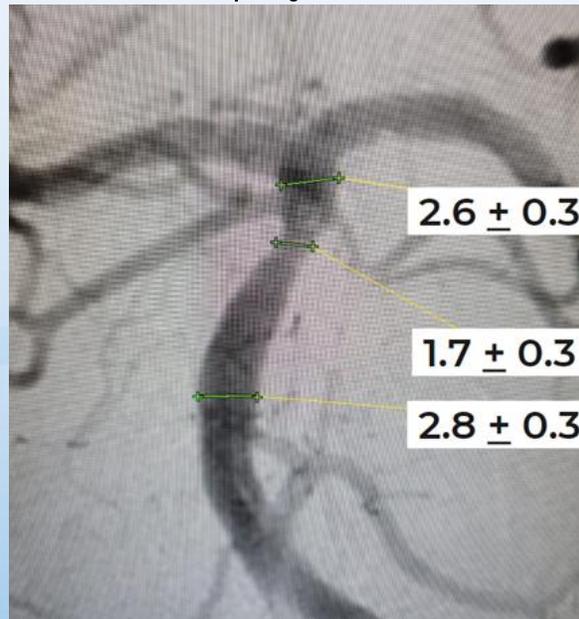
Pre NeVa VS

Basilar segment vasospasm



Post NeVa VS

Narrowing improvement after NeVa VS deployment



PRESENTATION

- 23-year-old female patient
- Treated day 18 post-SAH on a basilar segment vasospasm

OUTCOME

- Neurological improvement
- Headaches subsided
- No further endovascular treatment needed

RIGHT MCA SEGMENT VASOSPASM WITH 51% NARROWING



Dr Shahid Nimjee, MD, PhD, The Ohio State University Wexner Medical Center, Columbus, Ohio

“Complete angiographic resolution of vasospasm with one pass! It’s my new go-to device for symptomatic vasospasm.”

Pre NeVa VS

Severe vasospasm



Post NeVa VS

Narrowing improvement after NeVa VS deployment



PRESENTATION

- 50+ year-old male patient
- Treated Day 6 post-SAH on R-MCA segment vasospasm

OUTCOME

- 51% narrowing pre-treatment down to 11% narrowing 5-minutes post treatment
- No further endovascular treatment needed

LEFT MCA VASOSPASM WITH SIGNIFICANT NARROWING



Dr Reza J Karimi, MD, FAANS, FACS, Hackensack Uni Medical Center, Hackensack, New Jersey

“The NeVa VS device was easily deployed in the target blood vessels and was remarkably effective in restoring spastic arteries to near normal size. The procedure was straightforward, efficient and ultimately the patient made a full recovery.”

Pre NeVa VS

Left-MCA has significant narrowing



Post NeVa VS

Left-MCA restored to near-normal size



PRESENTATION

- 26-year-old female patient
- Treated Day 6 post-SAH

INTERVENTION

- NeVa VS deployed three times to different vessels, three minutes each time

OUTCOME

- Neurological improvement
- No further endovascular treatment needed

LEFT MCA VASOSPASM IMPROVED IN TWO DEPLOYMENTS

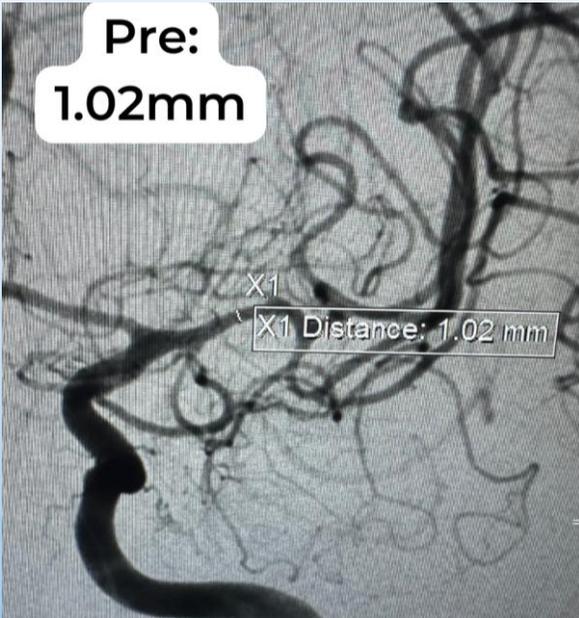


Dr Georgianne Snowden, MD, FACR, Integris Health Baptist Med. Center, Oklahoma City, Oklahoma

“I love having this new, very effective tool in our armamentarium for the battle against symptomatic vasospasm!”

Pre NeVa VS

Left MCA size: 1.02 mm



Post NeVa VS

Left MCA size nearly doubled to: 2.02 mm



PRESENTATION

- 57-year-old female
- Treated Day 5 for post-SAH from ruptured basilar tip aneurysm treated by emergent stent coiling
- Patient became more somnolent prior to the NeVa VS procedure. Transcranial dopplers were non-diagnostic

INTERVENTION

- NeVa VS deployed two times in the MCA, for five minutes each time

OUTCOME

- No further endovascular treatment needed

RIGHT MCA AND ACA TREATED WITH NEVA VS



Dr Arthur Grigorian, MD, Wellstar North Fulton Medical Center. Roswell, Georgia

“We observed excellent results with NeVa VS, with a marked improvement in mean transit time immediately after treatment, and the effect remained persistent.”

Pre NeVa VS

Significant narrowing of both MCA and ACA branches



Post NeVa VS

Vasospasmed branches restored to normal size



PRESENTATION

- 23-year-old female patient treated Day 18 post-SAH

INTERVENTION

- Heparin given prior to NeVa VS deployment
- NeVa VS deployed once in the MCA and twice in the ACA for 2 minutes at each deployment
- 5 mg Verapamil infused after NeVa VS

OUTCOME

- Immediate and sustained improvement in MTT
- No recurrence of spasm
- No further endovascular treatment needed

SEVERE LEFT ACA AND MCA SPASM TREATED WITH NEVA VS



Dr Arthur Grigorian, MD, Wellstar North Fulton Medical Center. Roswell, Georgia

“Another successful vasospasm resolution with the NeVa VS. The patient continues improvement on TCD, her neuro-exam is stable, and so far, no further endovascular treatment needed...”

Pre NeVa VS

Severe left ACA- A1/A2 and left MCA-M1 spasm



Post NeVa VS

Vasospasmed branches restored to normal size



PRESENTATION

- 46-year-old female patient treated Day 8 post-SAH

INTERVENTION

- 5000 units of Heparin given prior to NeVa VS deployment
- NeVa VS deployed twice in the ACA & once in the MCA
 - ACA: deployed, re-sheathed, re-deployed: total 5 min. deployment time
 - MCA: deployed, re-sheathed: total 2 min. deployment time
 - No verapamil or other medication used after NeVa VS

OUTCOME

- Immediate and sustained improvement in narrowing
- Patient continued improvement in the ICU

MODERATE-SEVERE BASILAR ARTERY VASOSPASM RESOLVED



Dr Ryan M Hebert, Yale School of Medicine, New Haven, Connecticut

“We were able to successfully treat this patient’s vasospasm with NeVa VS under conscious sedation. A big win for the patient and team.”

Pre NeVa VS

Moderate-Severe Basilar Artery spasm, Soustiel Ratio 4.0



Post NeVa VS

Significant improvement, Soustiel Ratio improved to 2.6



PRESENTATION

- Ruptured V4 Pica aneurysm was coiled
- Day 4 post-rupture, moderate-severe basilar vasospasm was observed

INTERVENTION

- The case was done under moderate sedation
- The lesion was accessed with a 5 Fr guide and a .021” micro-catheter

OUTCOME

- Soustiel Ratio improved from 4.0 before the intervention to 2.6 after NeVa VS deployment

MODERATE-SEVERE BASILAR ARTERY VASOSPASM RESOLVED - continued

Dr Ryan M Hebert, Yale School of Medicine, New Haven, Connecticut

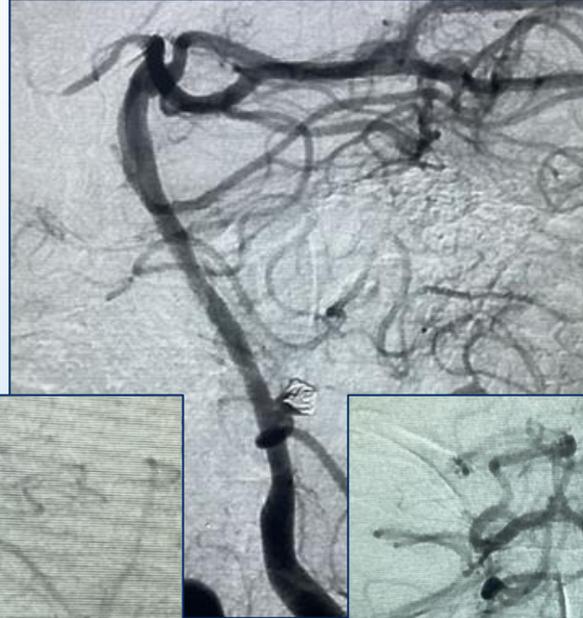
Pre NeVa VS

Moderate-Severe Basilar Artery spasm, Soustiel Ratio 4.0

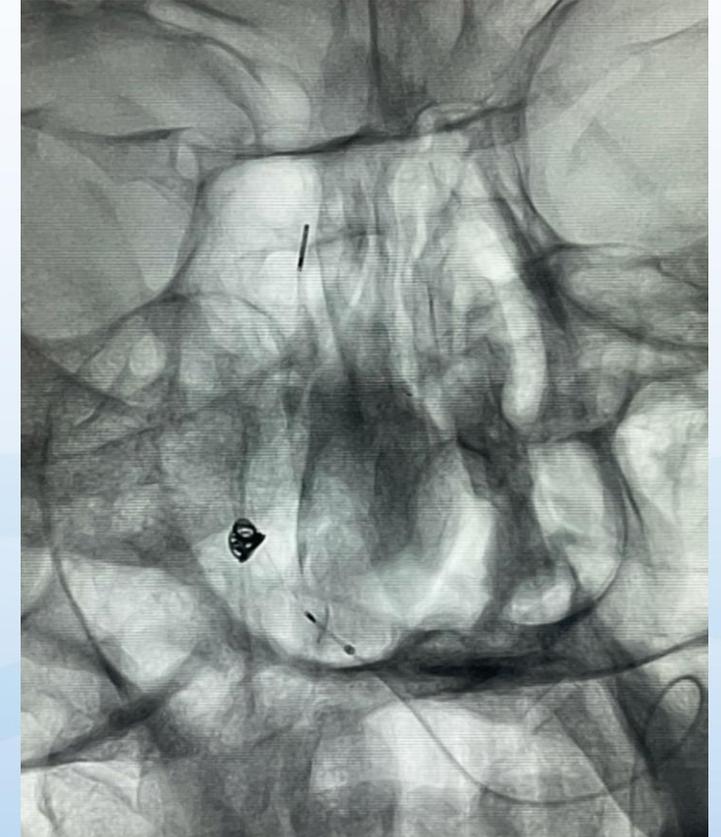


Post NeVa VS

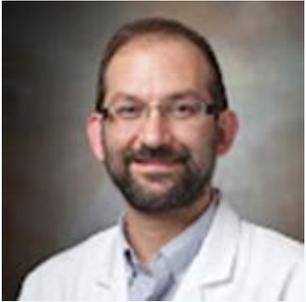
Significant improvement, Soustiel Ratio improved to 2.6



NeVa VS deployed in the Basilar Artery



MODERATE MIDDLE CEREBRAL ARTERY VASOSPASM RESOLVED



Dr Charles Matouk, Yale School of Medicine, New Haven, Connecticut

“Pretty nice response with NeVa VS from .8 and 1.25mm on a high grade SAH patient”

Pre NeVa VS



Post NeVa VS



PRESENTATION

- Ruptured 4mm Right anterior temporal aneurysm coiled
- Day 8, moderate vasospasm observed in the Right-M1

INTERVENTION

- The case was performed under general anesthesia
- Headway 27 microcatheter used to deploy NeVa VS

OUTCOME

- Significant improvement of vasospasm observed on radiographic images
- HIGHEST MCA MV: 79, Previously 272

SEVERE BASILAR VASOSPASM IN A 22 YO PATIENT

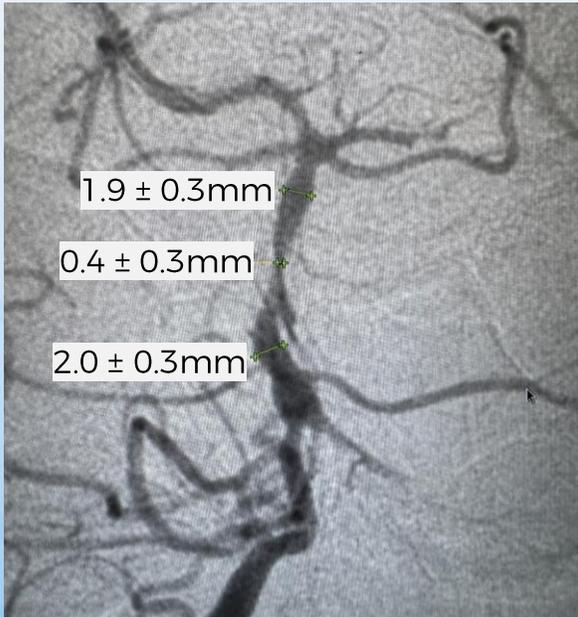


Dr Ameer Hassan, MD, Valley Baptist Neuroscience Institute, Harlingen, Texas

“Having NeVa VS on our shelf for severe vasospasm post SAH has proven to be a valuable tool for some of the sickest patients we see.”

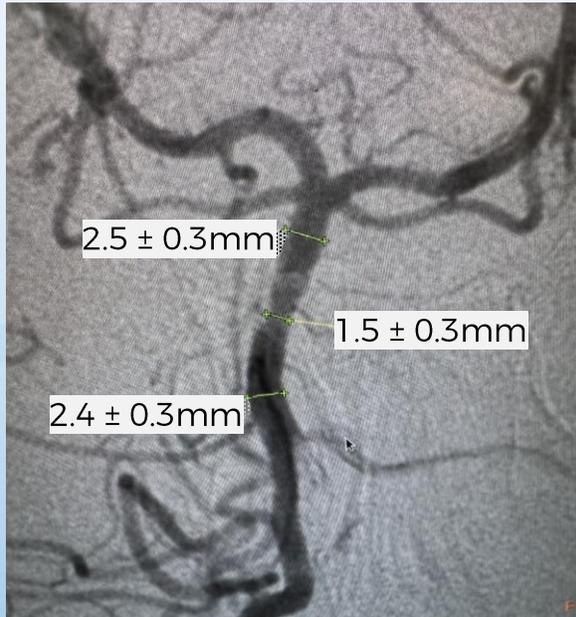
Pre NeVa VS

Basilar segment vasospasm



Post NeVa VS

Narrowing improvement after NeVa VS deployment



PRESENTATION

- 22-year-old who initially presented with Hunt Hess 2, Fisher grade 3 SAH

INTERVENTION

- NeVa VS 4.0 x 22 deployed via phenom 27 microcatheter for 10 minutes, then re-sheathed
- 10mg of verapamil infused simultaneously via microcatheter

OUTCOME

- Almost 300 % improvement in vessel diameter

R-MCA VASOSPASM GONE WITH A SINGLE 5-MINUTE DEPLOYMENT



Dr David L. Dornbos III, MD, Kentucky Neuroscience Institute, Lexington Kentucky

“That honestly worked great. The patient was in severe vasospasm, getting daily treatments. Once I operated with the NeVa VS, he didn’t need to come back. It completely snapped him out of daily vasospasm treatment.”

Pre NeVa VS

R-MCA vasospasm



Post NeVa VS

R-MCA restored



PRESENTATION

- 28-YO patient with an aneurysm in the right P-COMM, completely healthy prior to the SAH
- Angiogram showed coiled P-COMM aneurysm and vasospasm in the right middle cerebral artery (R-MCA)

INTERVENTION

- NeVa VS was delivered through a .027” micro-catheter (MC)
- The MC was then retrieved into the ICA and NeVa VS was left deployed for 5 minutes with simultaneous verapamil infusion through the intermediate catheter
- NeVa VS was easily re-sheathed and retrieved

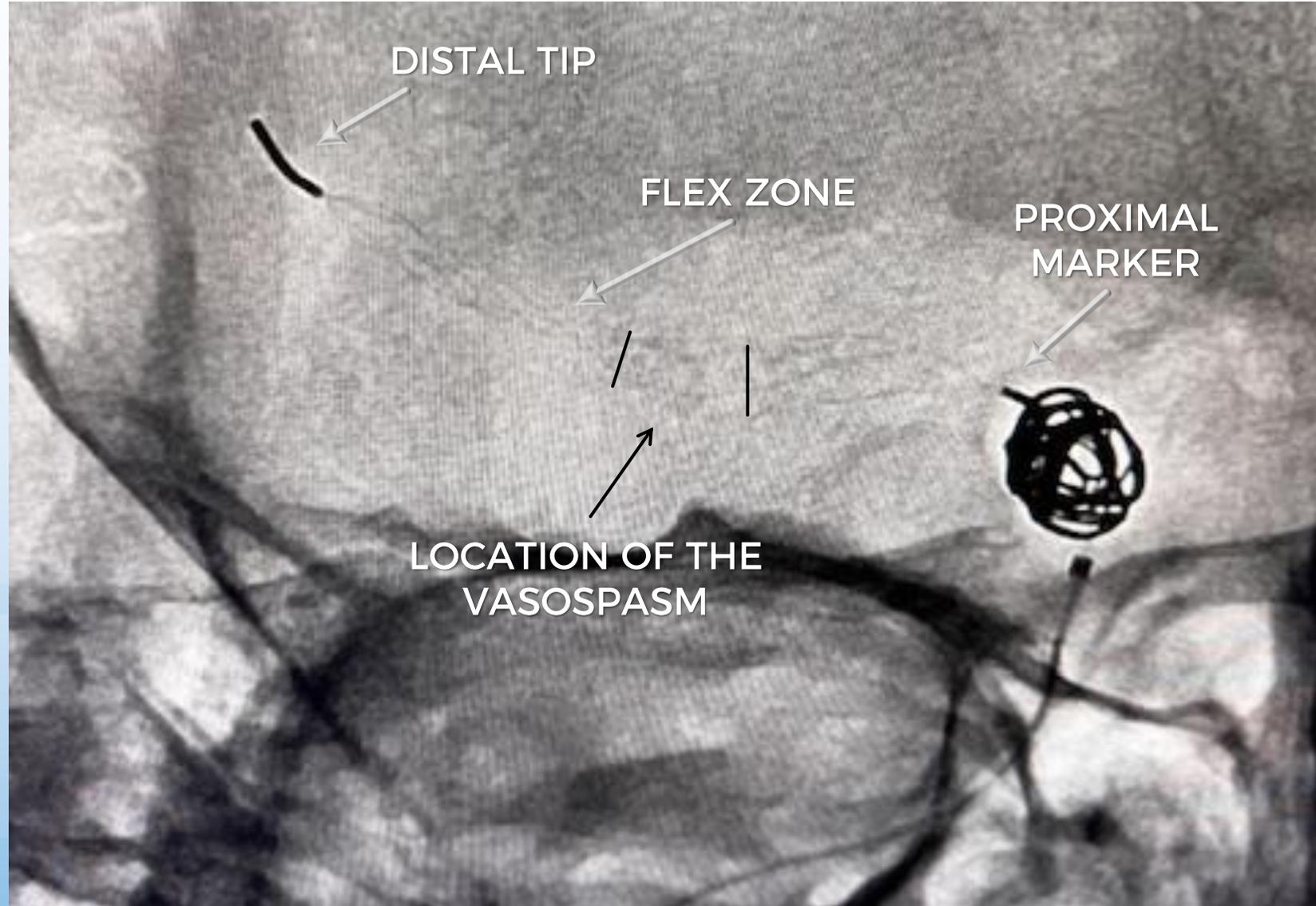
OUTCOME

- Immediate restoration of the R-MCA to normal size
- No further recurrence of vasospasm

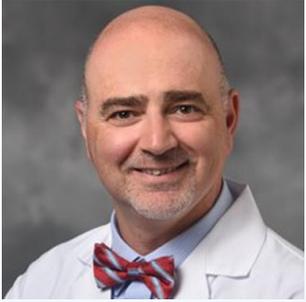
R-MCA VASOSPASM GONE WITH A SINGLE 5-MINUTE DEPLOYMENT

Dr David L. Dornbos III, MD, Kentucky Neuroscience Institute, Lexington Kentucky

NeVa VS deployed in
the R-MCA



PERSISTENT BILATERAL VASOSPASM TREATED WITH NEVA VS

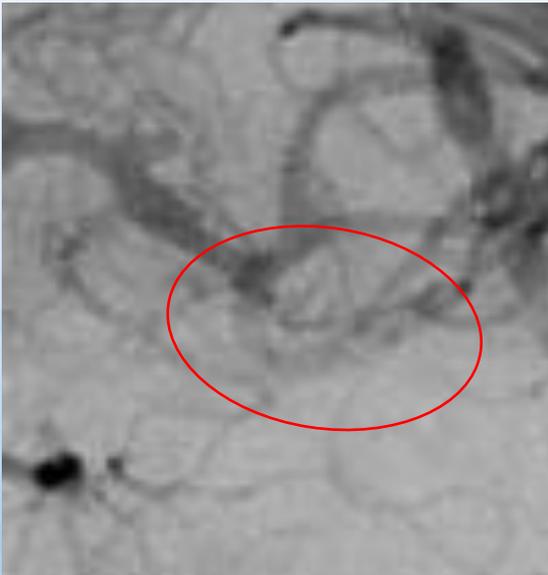


Dr Alex B Chebl, MD, FSVIN, Henry Ford Health, Michigan

“This vasospasm did not appear critical before treatment and improved transiently with nicardipine (Cardene) infusion. However cerebral transit time and perfusion remained delayed. After treatment with NeVa VS, the MCA vasospasm clearly improved but most importantly cerebral transit time and perfusion normalized with clinical improvement.”

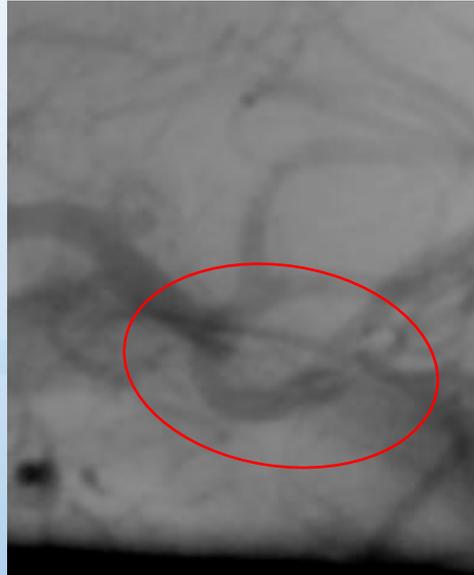
BEFORE NEVA VS

Inferior division L-MCA on POD-4 before the intervention



AFTER NEVA VS

Inferior division L-MCA restored to normal caliber



More information on the case and images of the right-MCA vasospasm available in the following pages...

PRESENTATION & INITIAL INTERVENTION

- 61-yo patient with congestive heart failure, hypertension, and left ventricle thrombus (1/2018) was transferred from outside hospital
- “Worst Headache” 7 days prior; Hunt & Hess Grade: 2, modified Fisher: 1
- CTA showed left ICA-T Aneurysm
- Successful coiling of ICA-T/ A1 aneurysm
- Angiogram showed mild bilateral vasospasm in the MCA

ADDITIONAL INTERVENTION

- Symptomatic vasospasm treated with IA nicardipine administered on days 1 and 4 with transient improvement, but follow-up TCD confirmed recurrent DCI associated with neurological decline
- Decision to treat with NeVa VS taken on day 4: NeVa VS deployed both in the left and right MCA (left-M1, left inferior division, right-M1)

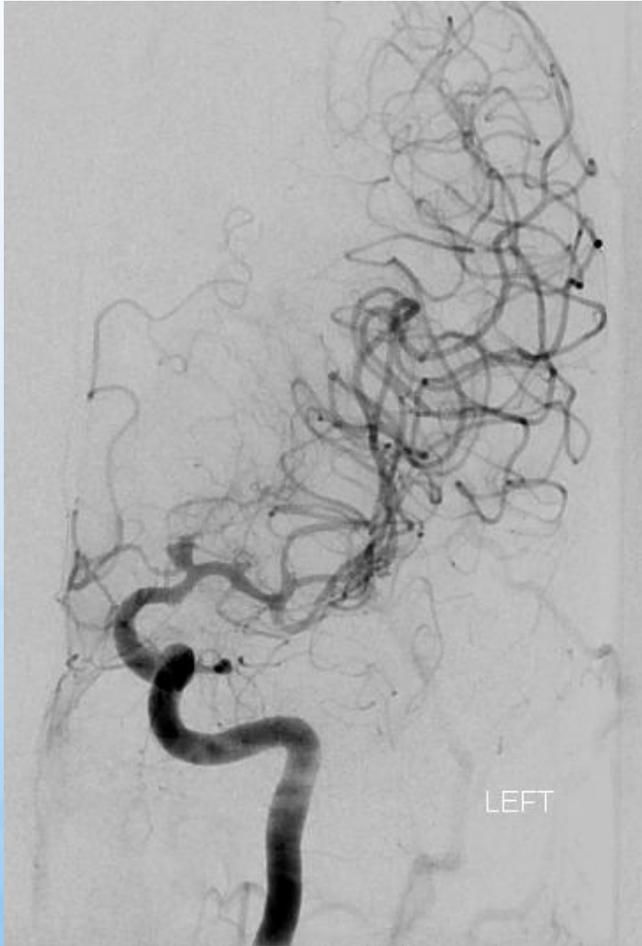
OUTCOME

- Full resolution of vasospasm post NeVa VS with no further recurrence & clinical improvement
- CT on day 8 showed no delayed ischemia

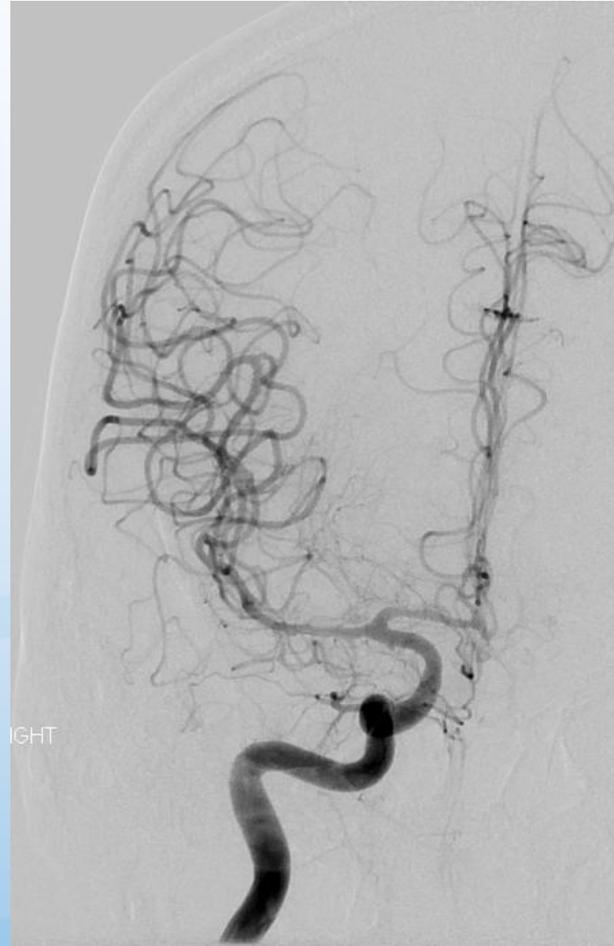
PERSISTENT BILATERAL VASOSPASM- POD-0 PRESENTATION

Dr Alex B Chebl, FSVIN, MD, Henry Ford Health, Michigan

LEFT ICA



RIGHT ICA



PRESENTATION

- 61-YO patient with Congestive Heart Failure, Hypertension, and Left Ventricle thrombus (1/2018)
- Transferred from outside hospital
- "Worst Headache" 7 days prior
- Hunt and Hess Grade: 2, modified Fisher: 1
- CTA showed Left ICA-T Aneurysm
- Angiogram showed Mild Bilateral Vasospasm in the MCAs, Left ICA-T Aneurysm and small Left Lenticulostriate Aneurysm
- Successful coiling of ICA-T/ A1 aneurysm

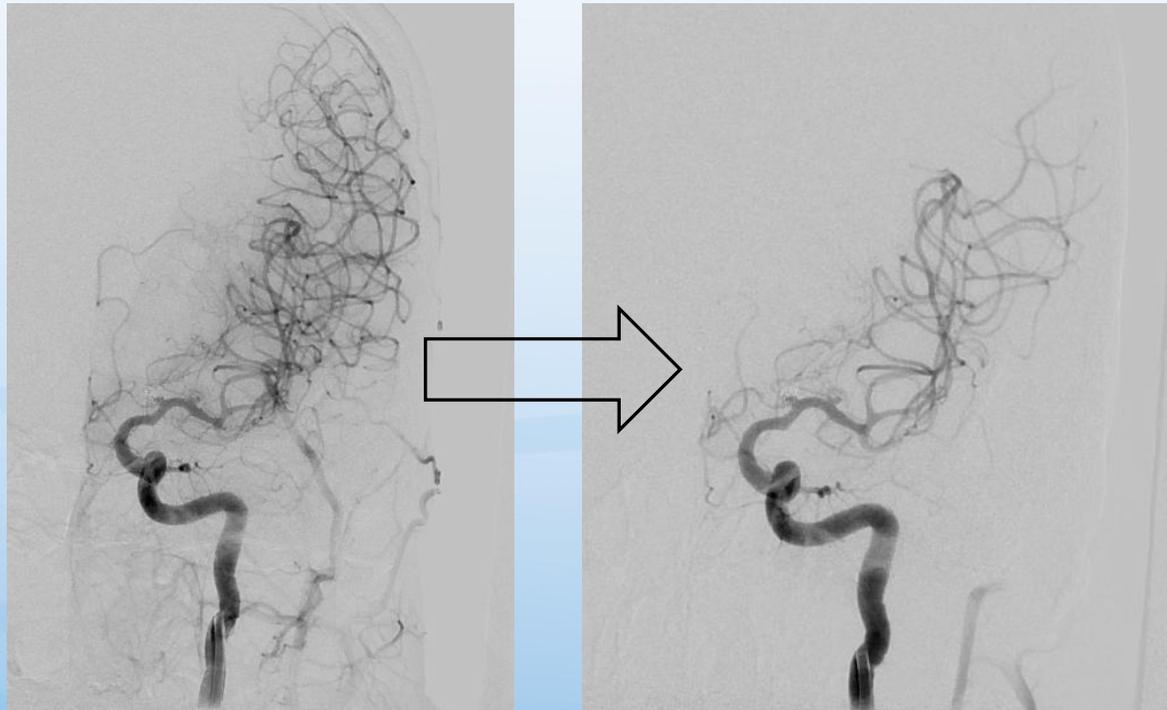
PERSISTENT BILATERAL VASOSPASM- POD 1 to 4

Dr Alex B Chebl, MD, FSVIN, Henry Ford Health, Michigan

POST OPERATIVE DAY 1

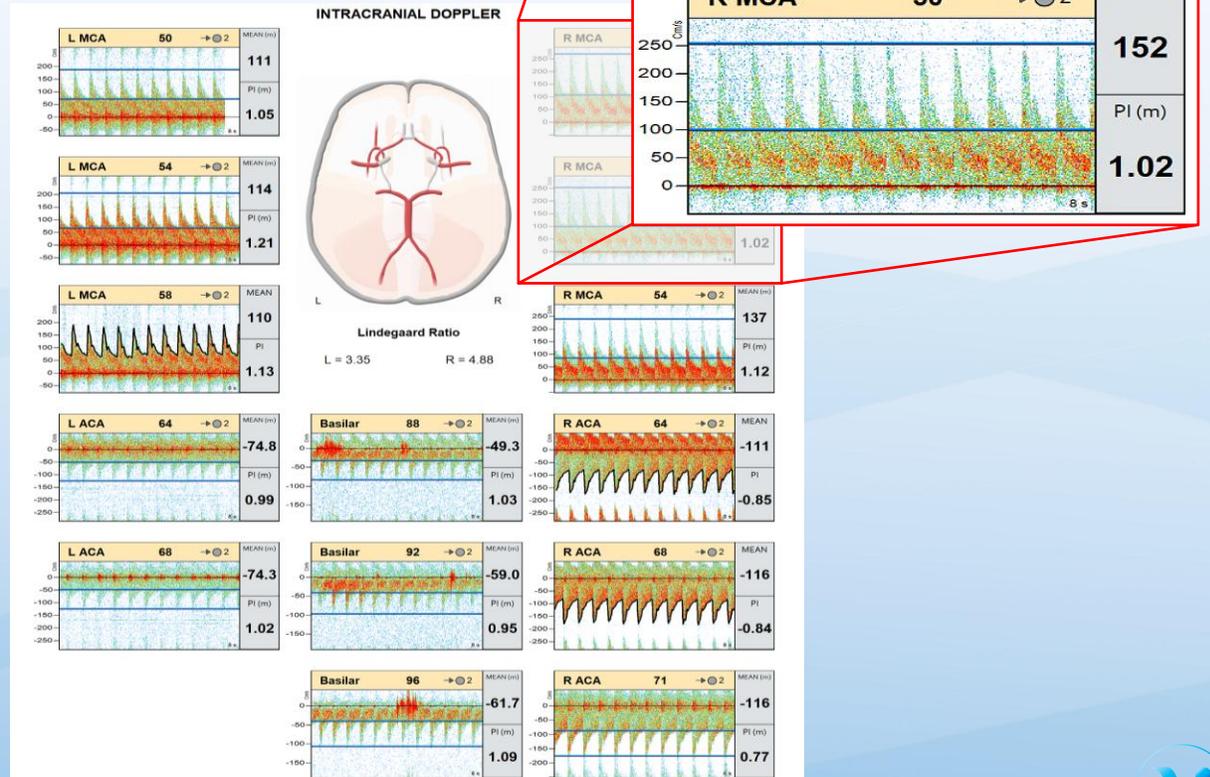
- Neurological worsening
- Severe spasm Left Inferior Division MCA
- 5 mg nicardipine administered intra-arterially

LEFT ICA



POST OPERATIVE DAY 4

- TCD- spasm recurrence
- Neurological Decline



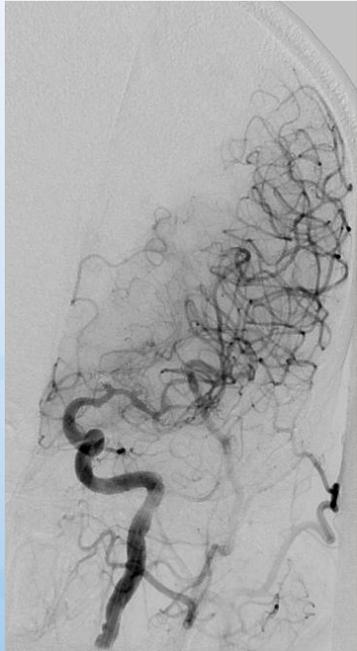
PERSISTENT BILATERAL VASOSPASM- POD 4

Dr Alex B Chebl, MD, FSVIN, Henry Ford Health, Michigan

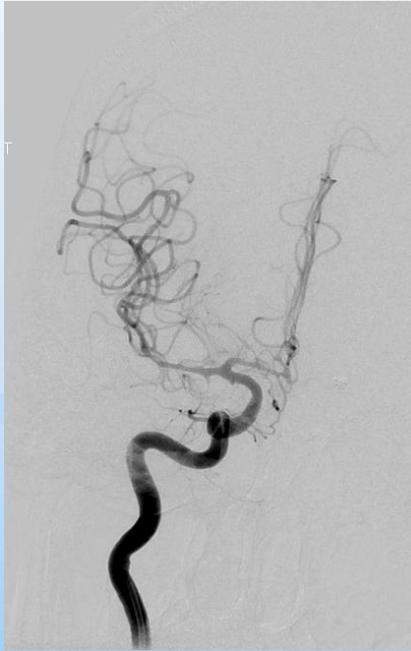
POST OPERATIVE DAY 4

- Moderate bilateral M1 spasm, severe left inferior division MCA spasm
- IA nicardipine administered into the bilateral ICA, MCA, and right ACA
- Minimal angiographic improvement
- Decision to treat with NeVa VS
- Heparin 3000U given IV
- Device deployed for 7 minutes in each vessel

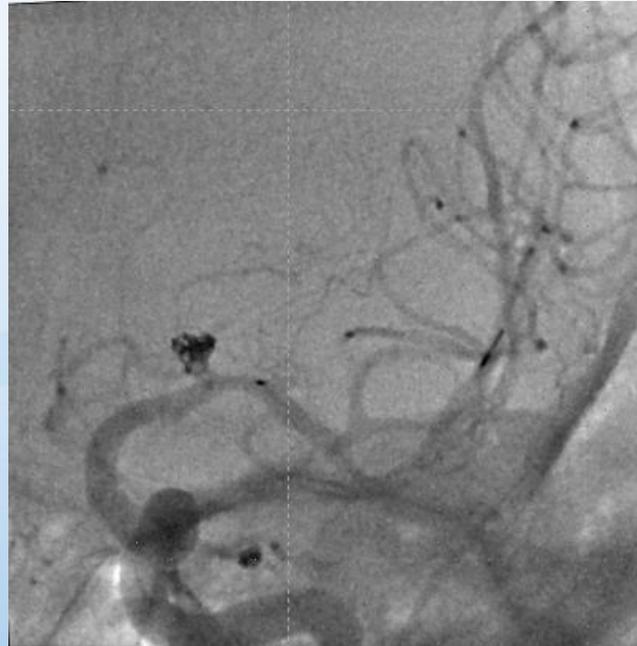
LEFT ICA



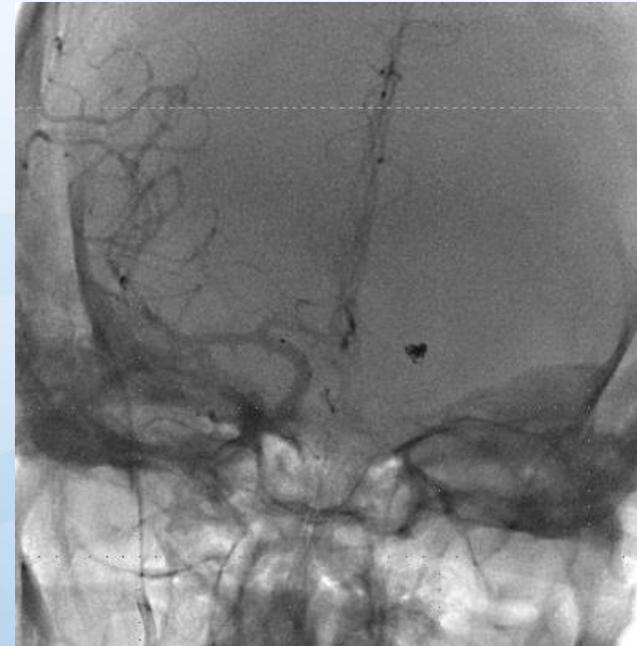
RIGHT ICA



LEFT Inferior Division and M1



RIGHT M1



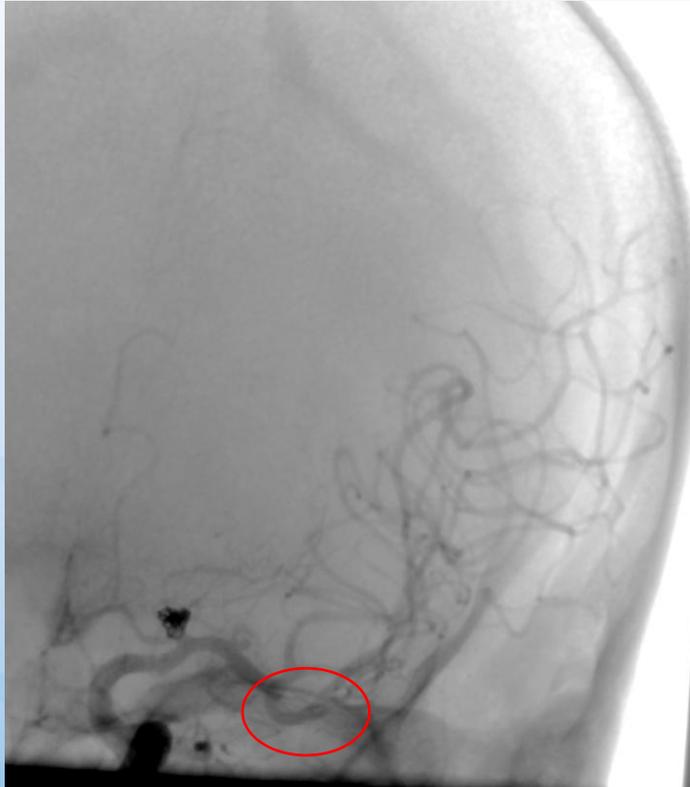
RESOLUTION BILATERAL VASOSPASM- POST NEVA VS

Dr Alex B Chebl, MD, FSVIN, Henry Ford Health, Michigan

POST NeVa VS

- Resolution of Spasm in MCAs and Inferior Division Left MCA
- No further recurrence of vasospasm with clinical improvement

LEFT ICA



RIGHT ICA



POST OPERATIVE DAY 8

- No further recurrence of vasospasm
- CT showed no delayed ischemia



BOTH A2 BRANCHES TREATED DAY 7 & 8 POST RUPTURE

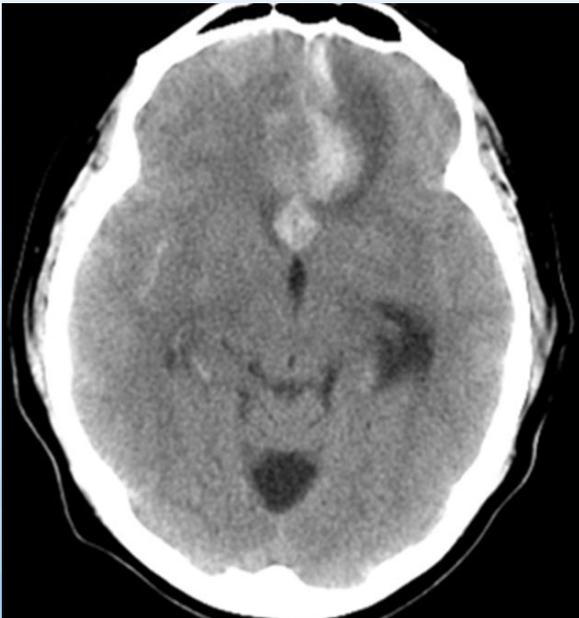


Dr Ameer Hassan, MD, Valley Baptist Neuroscience Institute, Harlingen, Texas

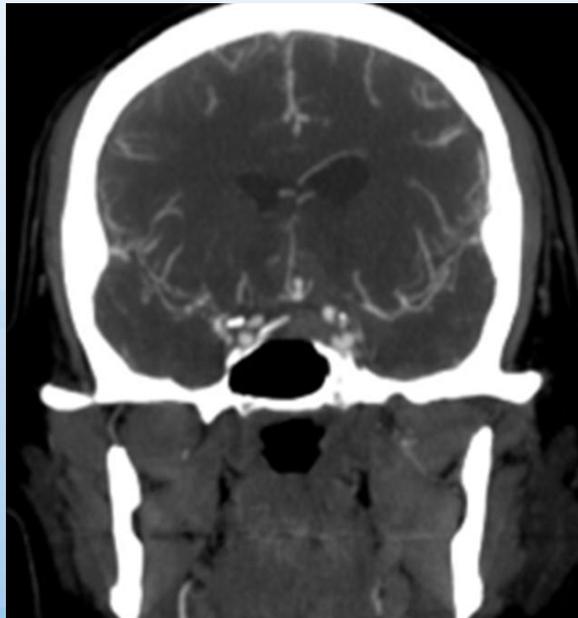
“A permanent solution that decreases ICU stay at no additional procedural safety cost.”

aSAH from ruptured A-comm aneurysm,
Hunting Hess: 1, Modified Fisher Grade: 3

CT



CTA



PRESENTATION

- 57-YO man with history of alcohol and tobacco use
- ETOH use d/o, Type 2 Diabetes Mellitus, Hypertension, Hyperlipidaemia
- Presented with headache with syncopal episode and fall
- +3Days: presented for evaluation of altered mental status

TREATMENT & OUTCOME

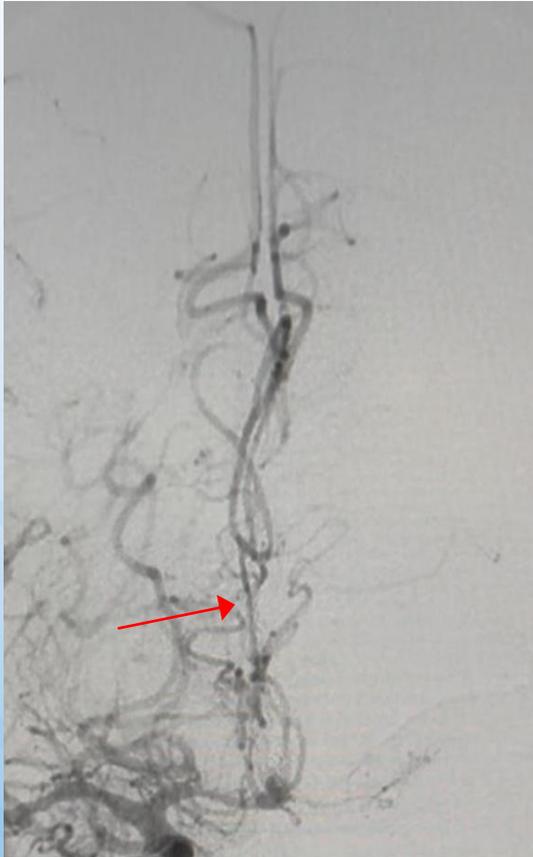
- PBD 6: Severe Vasospasm continues despite Verapamil (5mg in R-A1, 10mg in R-SC ICA)
- PBD 7: NeVa VS intervention on the left A2 + IA Verapamil 7mg in R-A1, 10mg in R-SC ICA: improvement
- PBD 8: NeVa VS intervention on the right A2 + IA Verapamil 5mg in R-A1, 10mg in R-SC ICA: improvement
- PBD 9: Vasospasm resolution complete, proceeded to A-Comm aneurysm residual coiling + IA Verapamil 10mg R-ICA

BOTH A2 BRANCHES TREATED DAY 7 & 8 POST RUPTURE

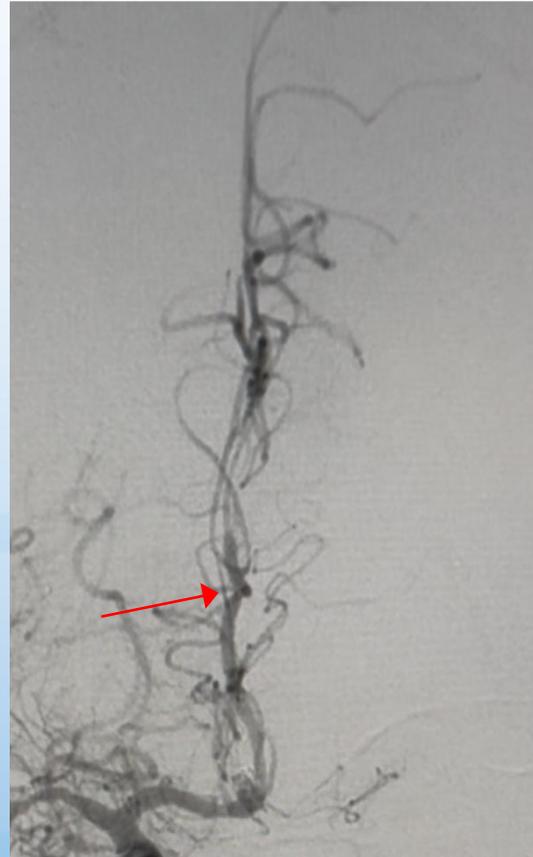
Dr Ameer Hassan, MD, Valley Baptist Neuroscience Institute, Harlingen, Texas

AP view before-after

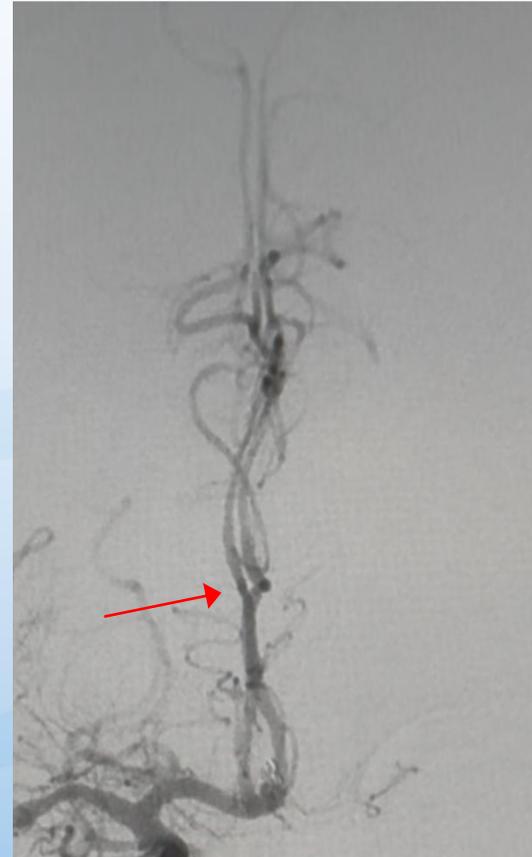
PBD 6
Severe Vasospasm despite
IA-Verapamil



PBD 7
After NeVa VS intervention
on the left A2



PBD 8
After NeVa VS intervention
on the right A2



PBD 9
After vasospasm resolution

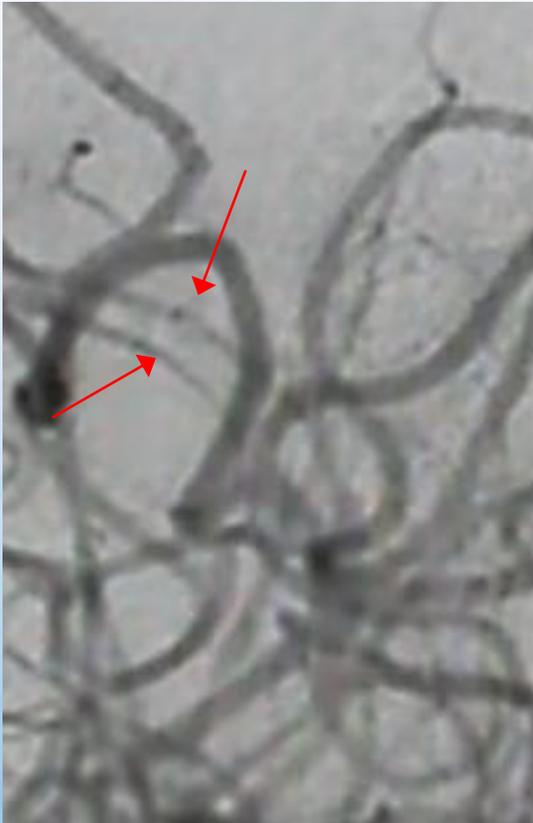


BOTH A2 BRANCHES TREATED DAY 7 & 8 POST RUPTURE

Dr Ameer Hassan, MD, Valley Baptist Neuroscience Institute, Harlingen, Texas

Lateral view before-after

PBD 6
Severe Vasospasm despite
IA-Verapamil



PBD 7
After NeVa VS intervention
on the left A2



PBD 8
After NeVa VS intervention
on the right A2



PBD 9
After vasospasm resolution



Nevia™ VS