# Carotid Stenting with Optimized Filter Protection Technique of a German Centre

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**ACST2-Meeting 2016**

# Some data from Germany:

- every carotid procedure has to be referred to the national registry:
  33.500 male 68% age 70.5 years

- CEA 27.000 (81%)
- CAS 6.500 (19%)

# SOP University Hospital of Jena

- Patient > 70 y.o. -> CEA
- Patient < 65 y.o. -> CAS

# Study Design:

monocentric, retrospective

90 consecutive patients 2011 - 2013

63 male; age 41 – 62 – 82

31 asymptomatic, 22 TIA, 27 minor, 10 major stroke

# Intervention:

| | |
|---|---|
| technique: | stenting (Wallstent), filter protection (EPI) |
| indication: | asymp. > 70%, sympt. > 50% NASCET stenosis |
| timing: | within 7 days of symptoms |
| imaging: | MRI 24 h before and 24-72 h after (incl. diff., perf.) |
| clinics : | NIHSS the day before and 6 hours after stenting (ICU) |

# Procedure:

ASS 500 mg, Clopidogrel 600 mg on day before,
impedance aggregometry, antiplatelet cont. 6 months

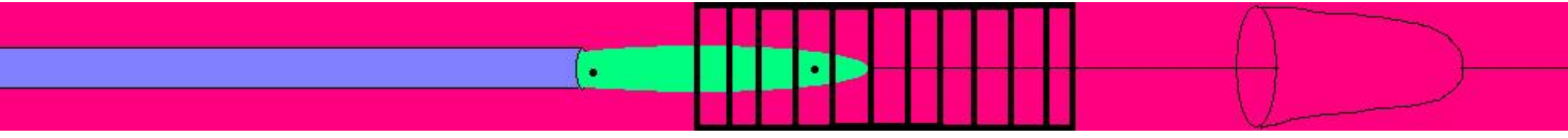
Heparine the day before and during stenting

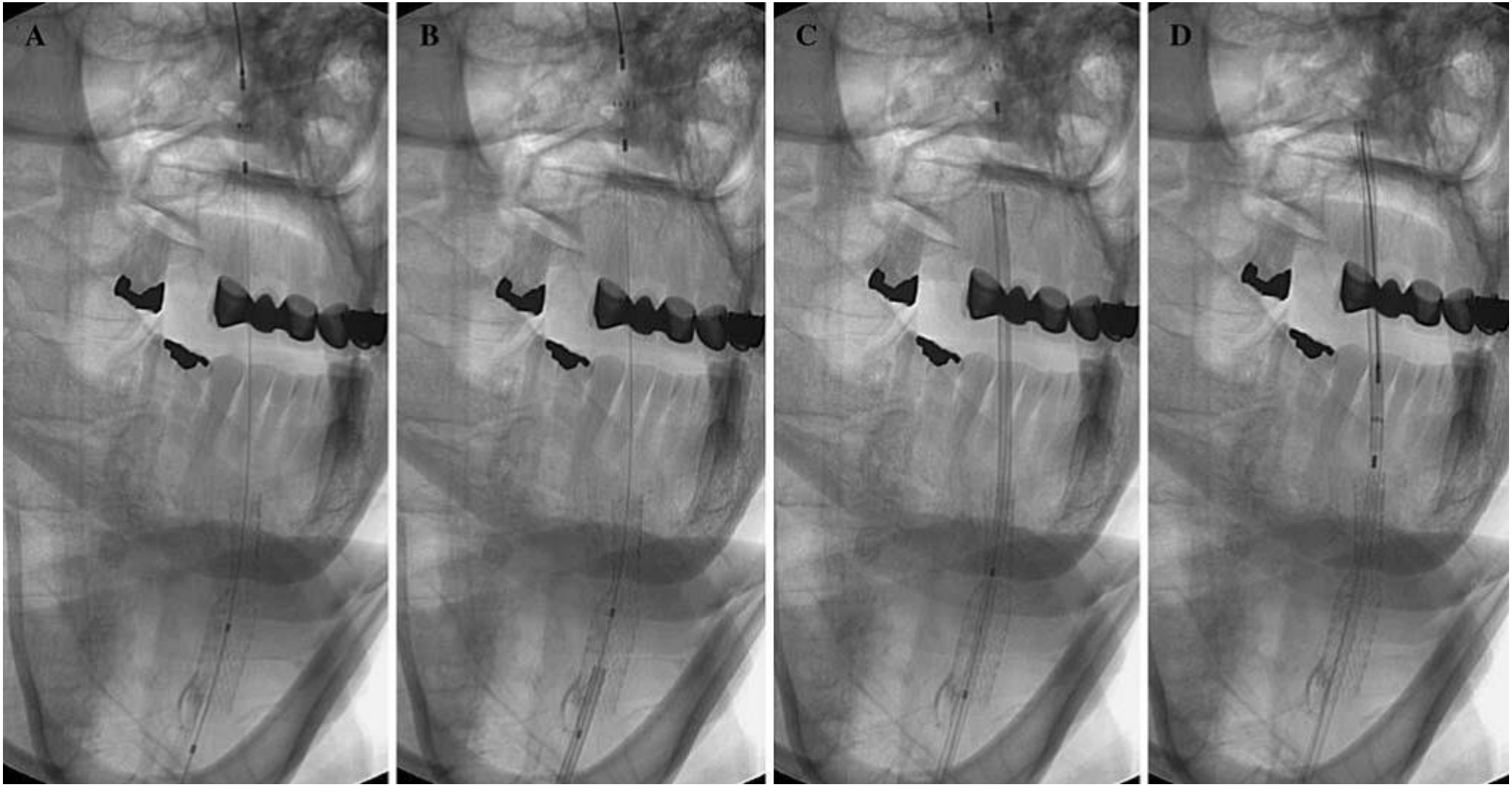
Special technique: filter retraction with balloon into coaxial cath.

Stent must have a 5 F profile

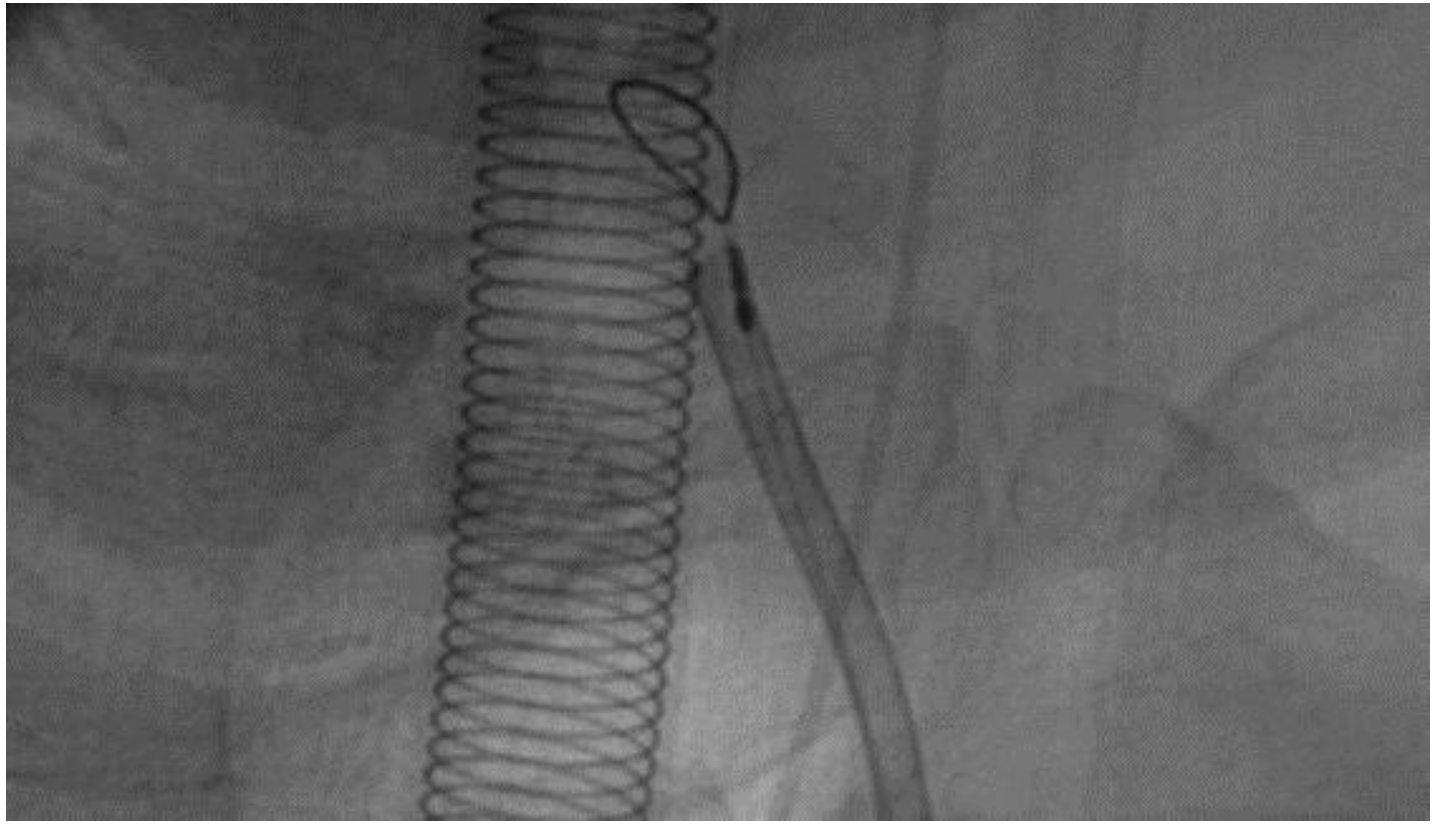
6 F coaxial catheter used for retrieval

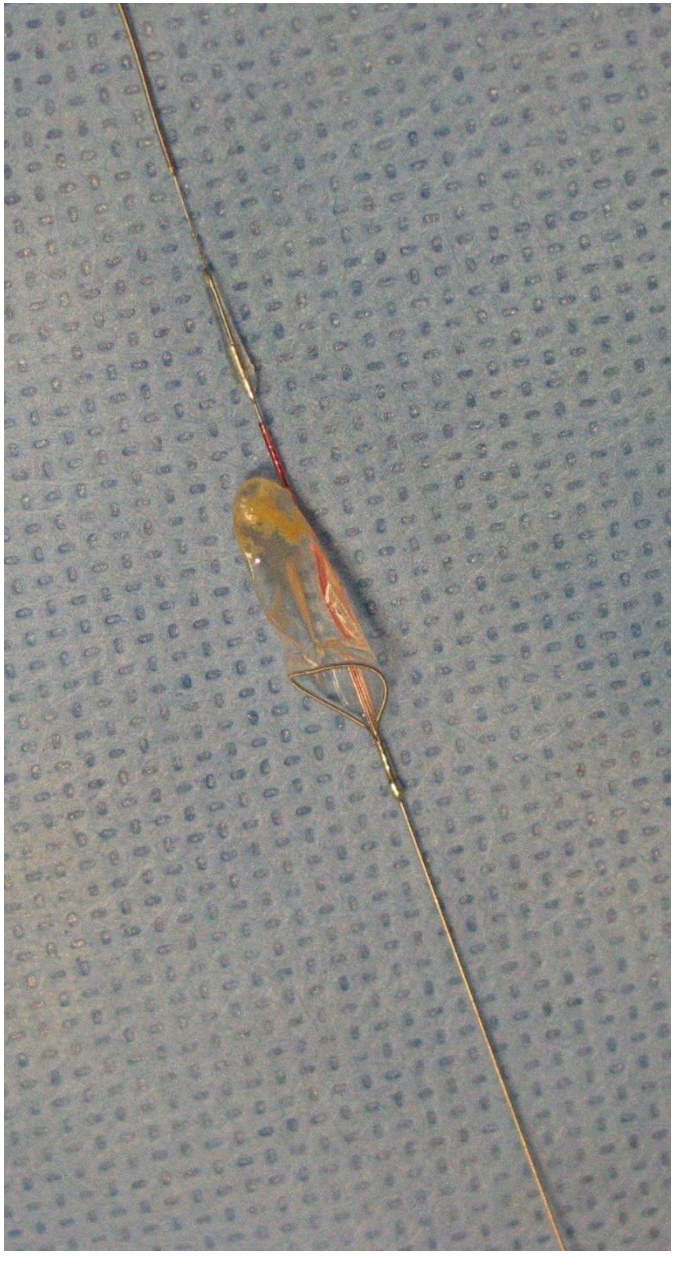
Balloon used as guide




A
B
C
D

# Retrieval of the filter



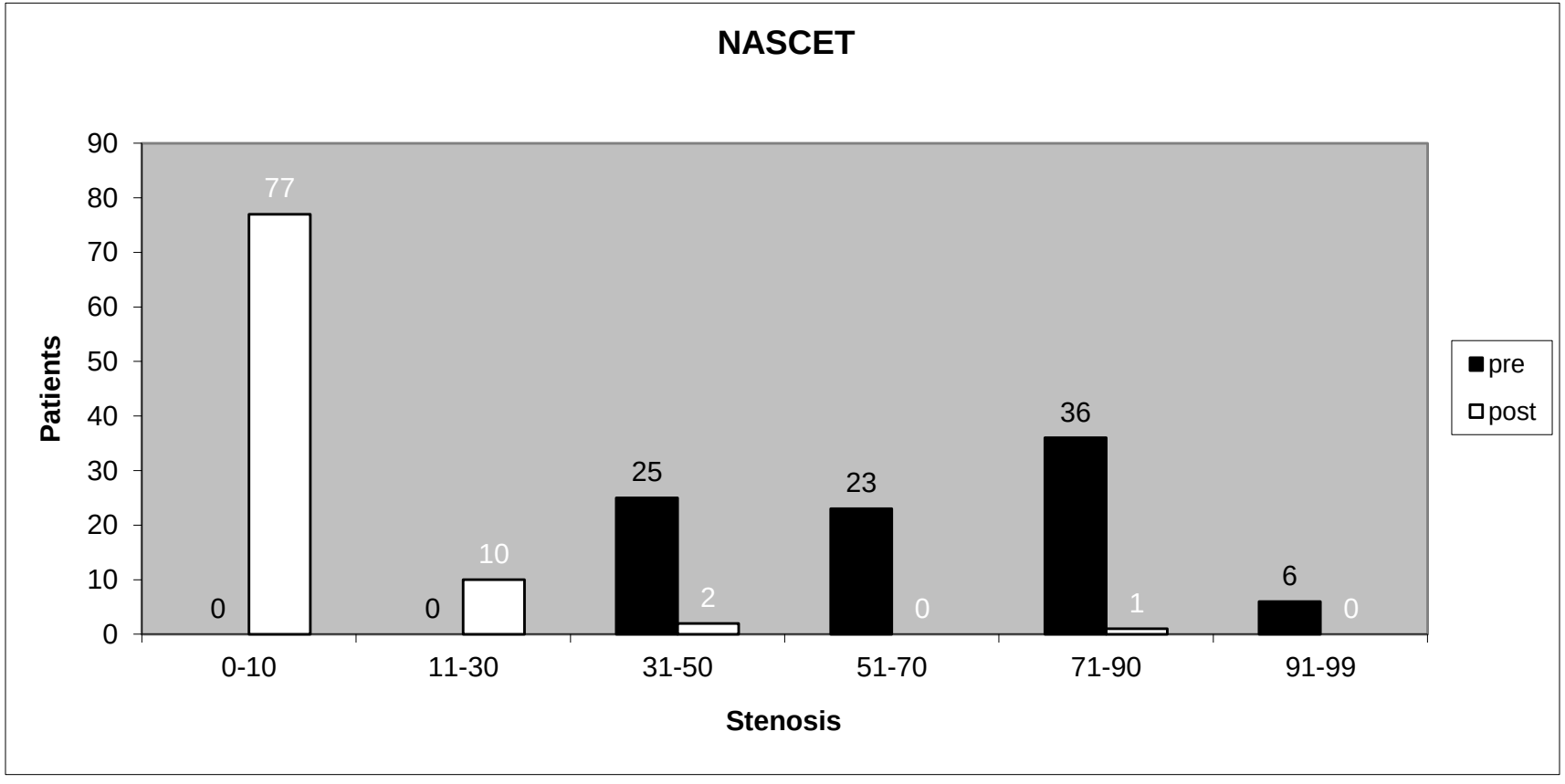


Material catched by the filter

# Advantages

- **spars retrieving the balloon, while keeping the filter in place**
- **spars introducing a retrieval catheter**
- **avoids the risk of the filter getting caught by the stent**
- **allows suction during filter retrival in case of thrombosis**

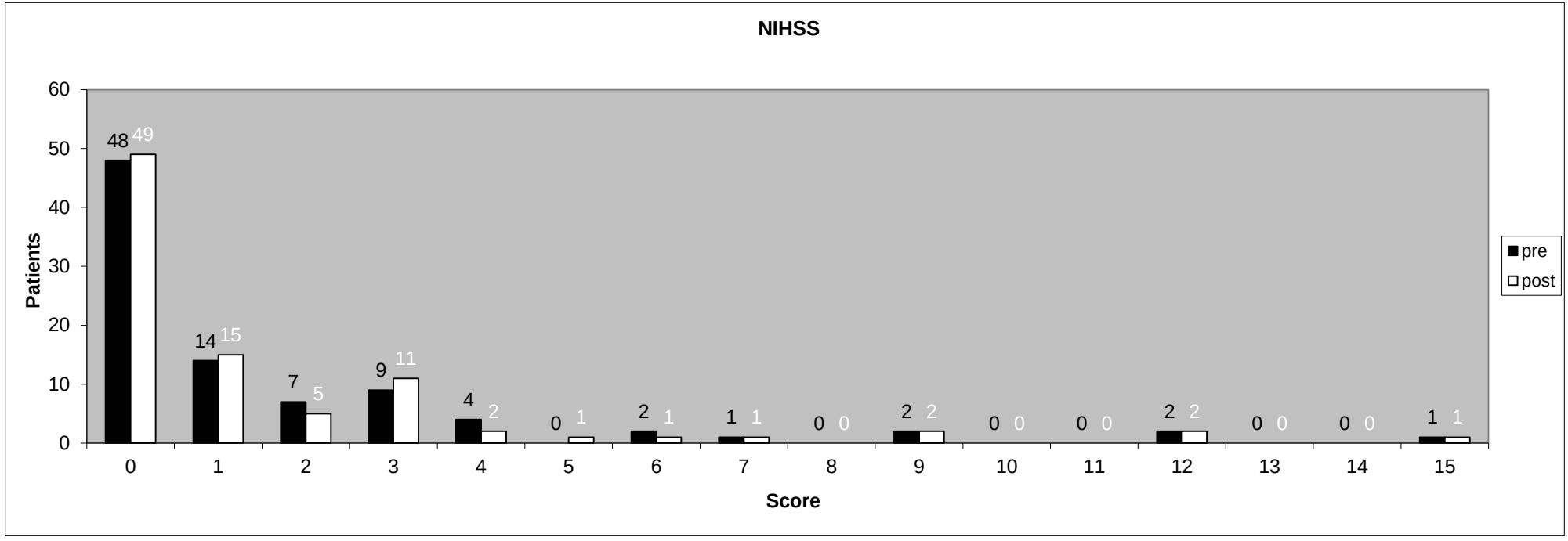
# results: recanalisation



# results: restenosis

- from 76 Patients 6 month US controls were available
- 4 patients (5%) developed restenosis > 50%
- predictors were rest stenosis (p = 0,044) and
- primary high grade stenosis (p = 0,038)

# results: short term outcome



# 6 hours after stenting

| | |
|---|---|
| NIHSS pre < post | 0 |
| NIHSS pre = post | 84 |
| NIHSS pre > post | 6 |
| Wilcoxon-Test | p = 0.031 |

# Periproc. complications:

| | |
|---|---|
| vasospasm | 3 |
| TIA / loss of consc. (for minutes) | 6 |
| hypertension | 7 |
| NSTEMI | 3 |
| groin hematoma | 3 |

# 38 MRI follow-up

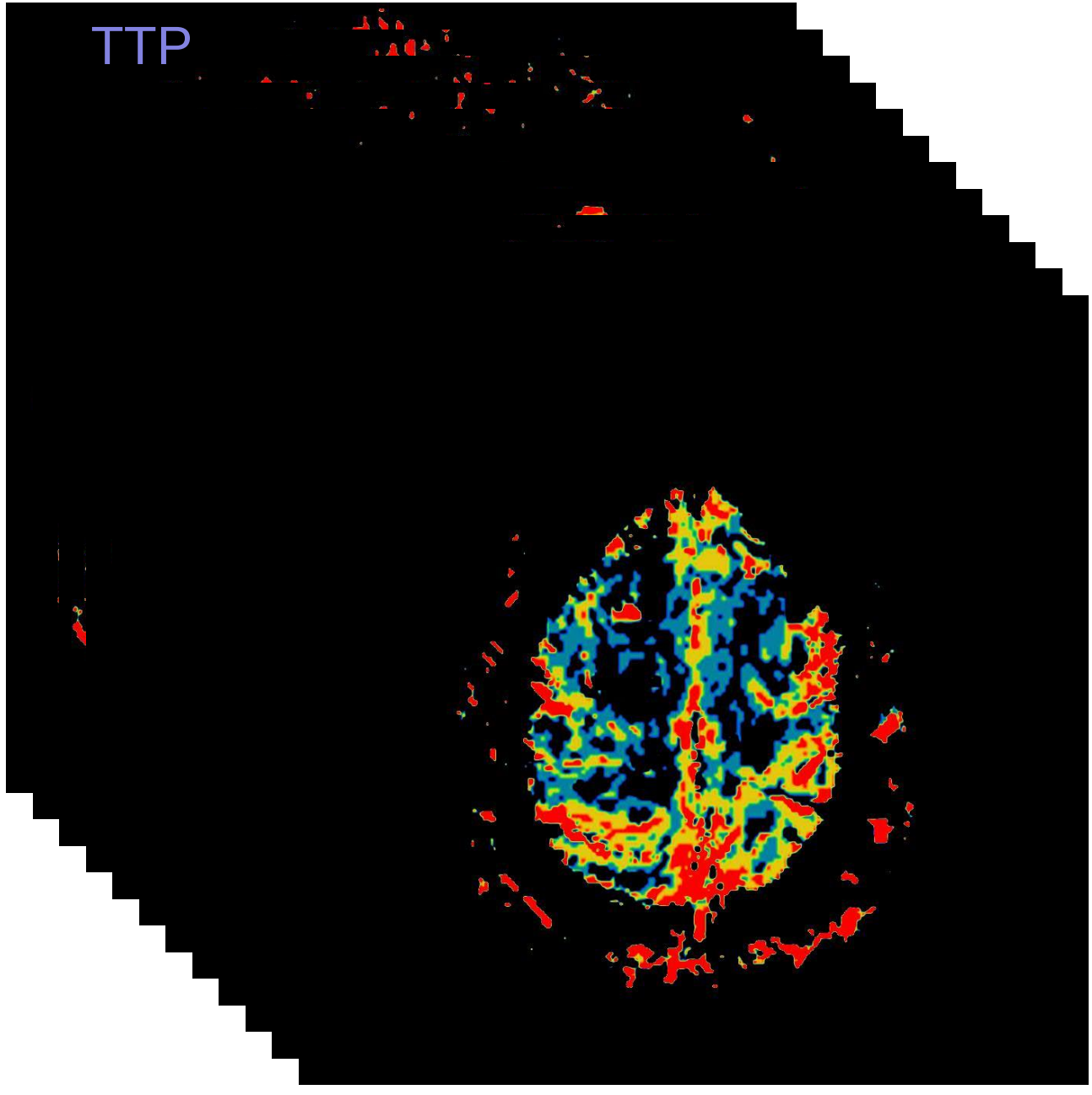
others: plain CT without new infarction
or no imaging post stenting

new DWI lesions

number: 35 les. in 14 pts. (37%)
size: 23 les. < 5 mm, 12 les. 5-10mm
location: 24 within perfusion def., 11 outside
NIHSS: 12 equal, 2 improved

Female, 71 y.o., asymptomatic,
progr. 85% stenosis of the left carotid

ACST-2 in 3 / 2016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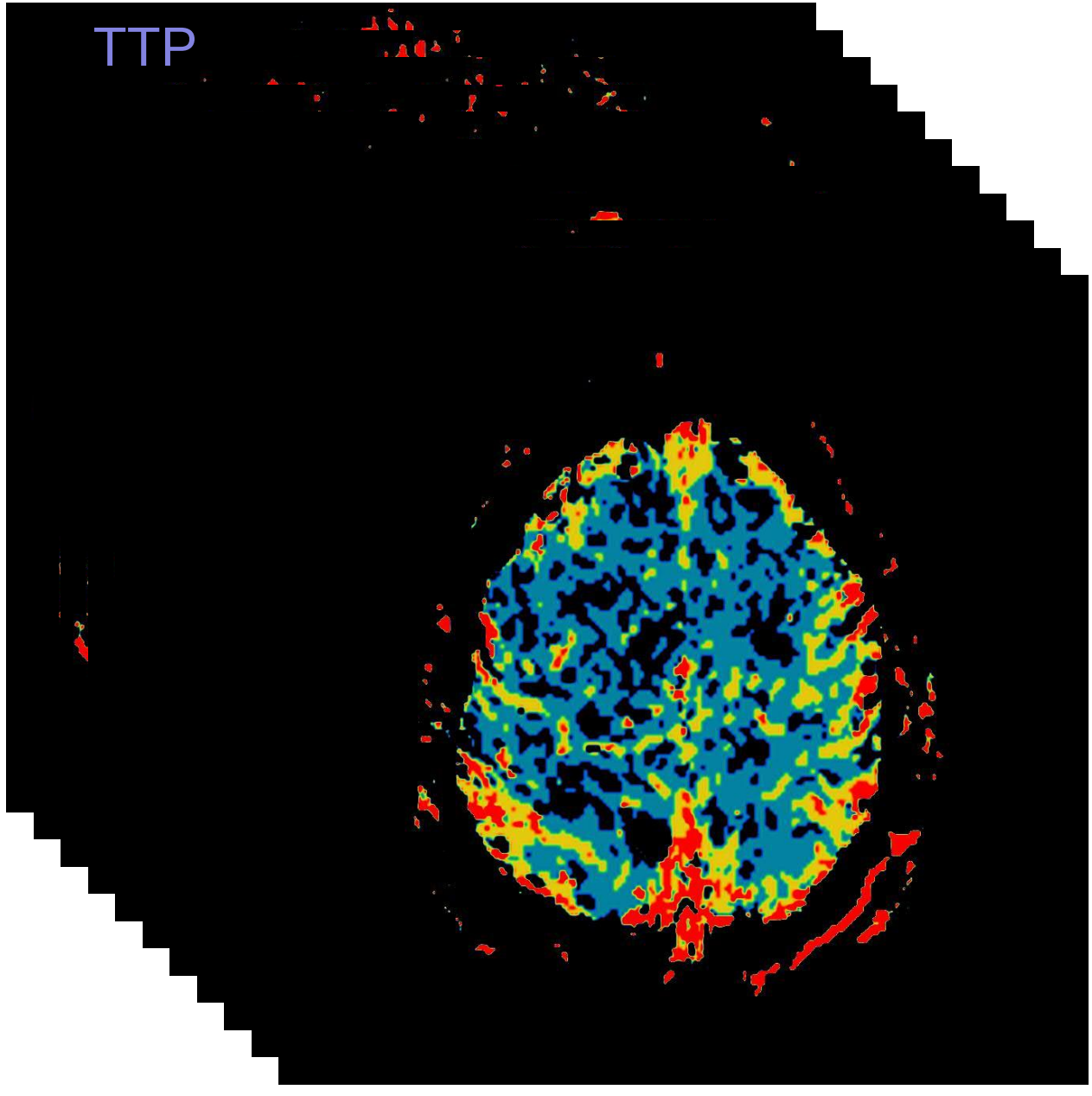
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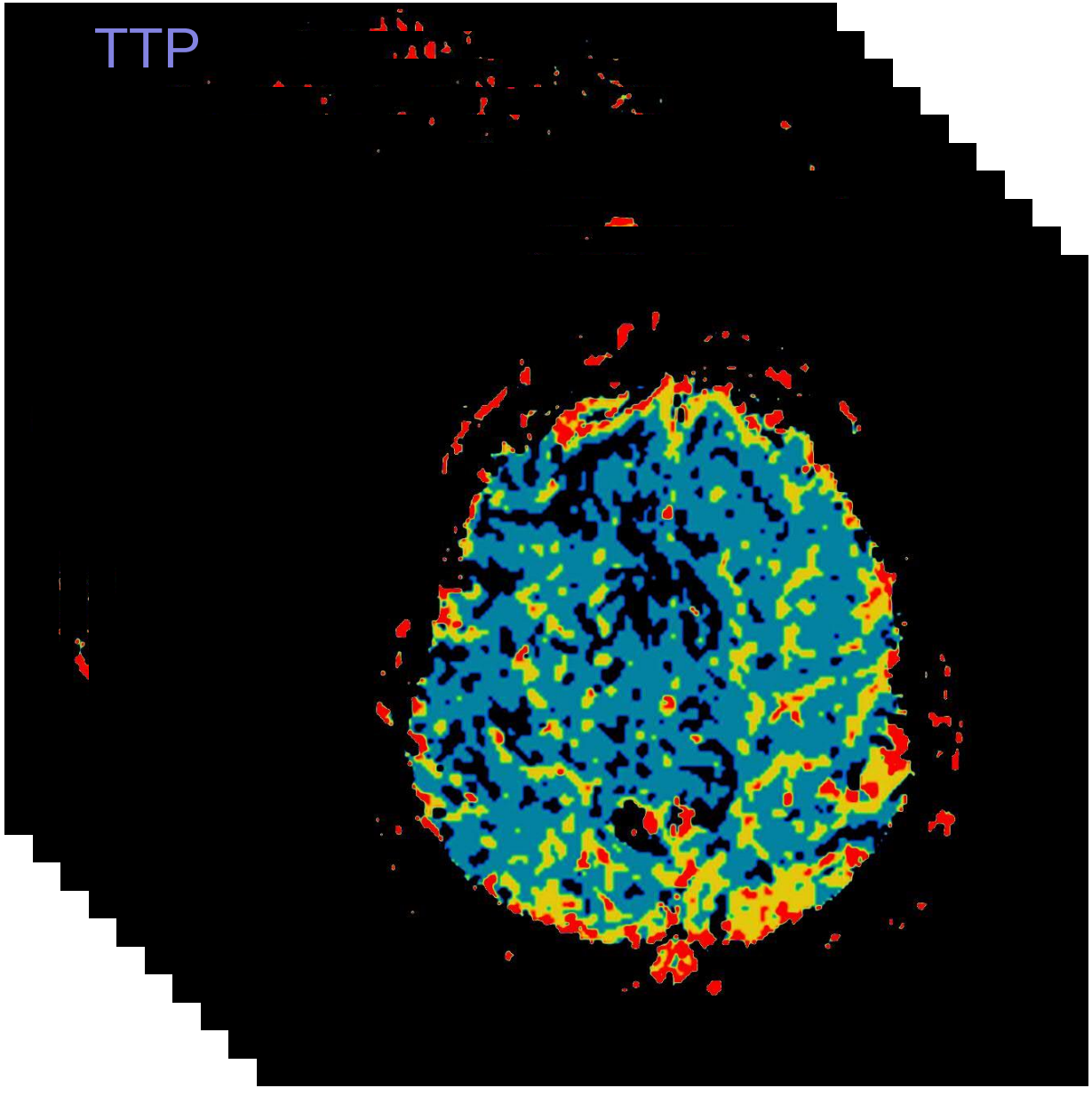
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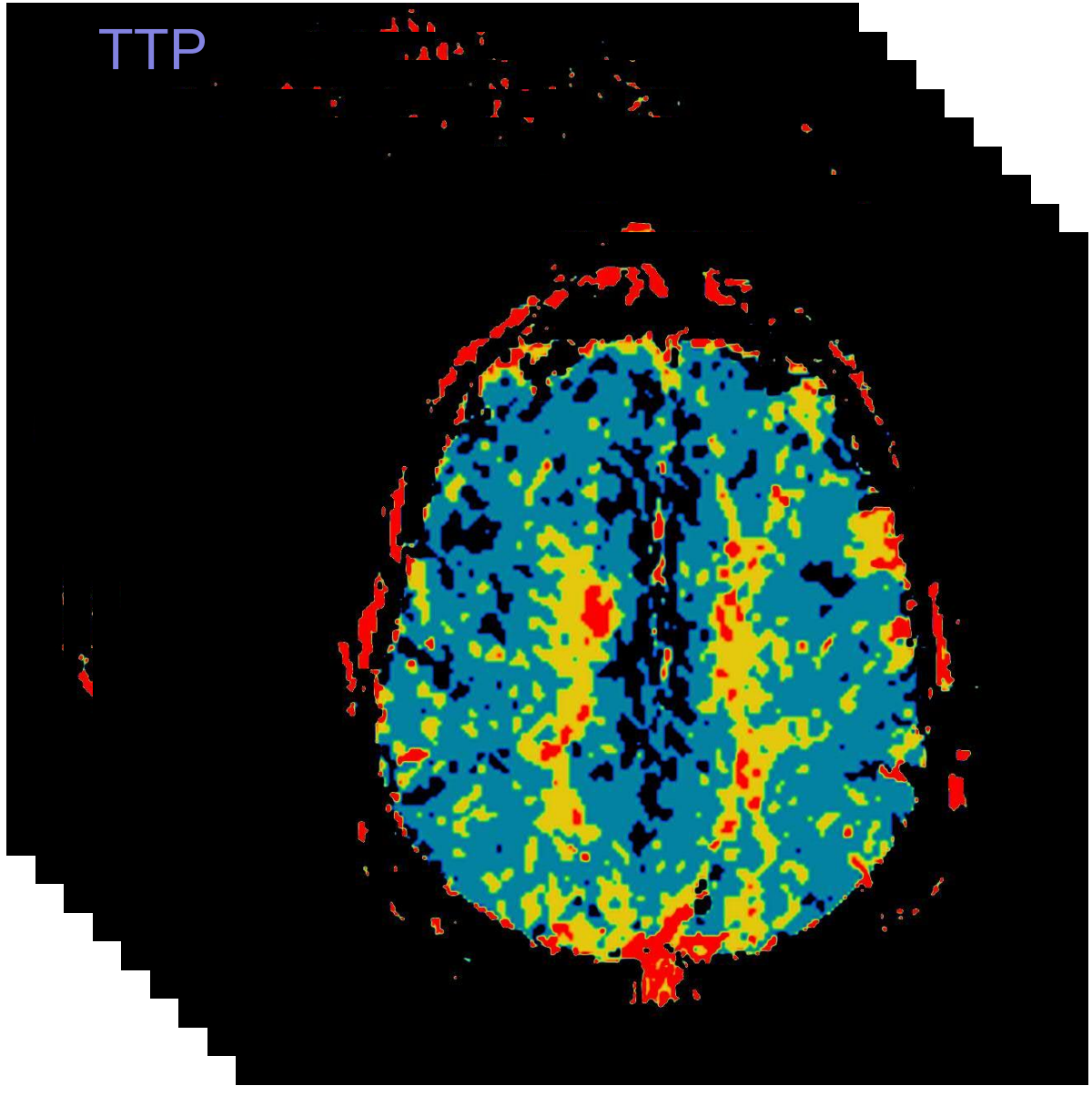
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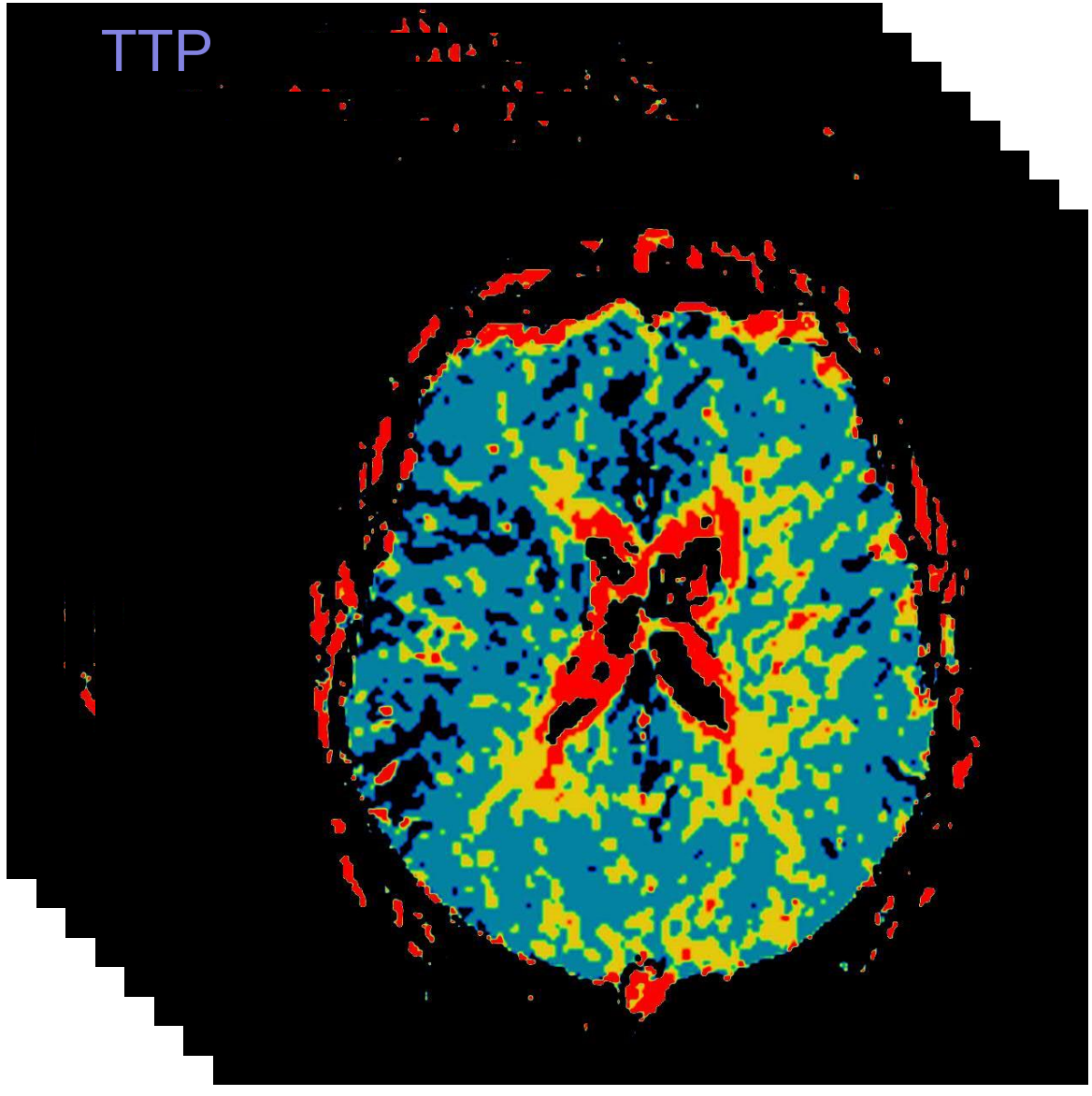
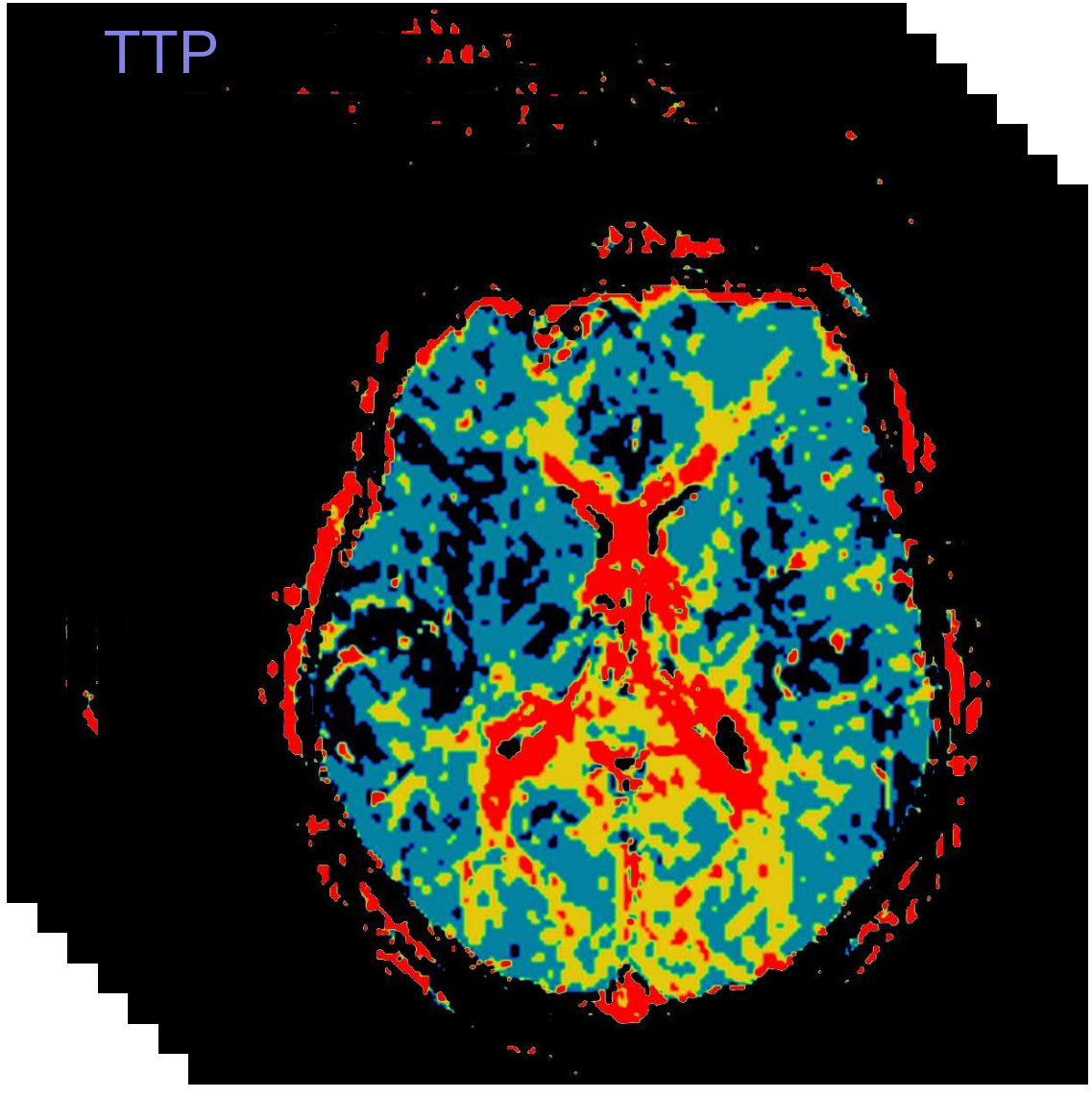
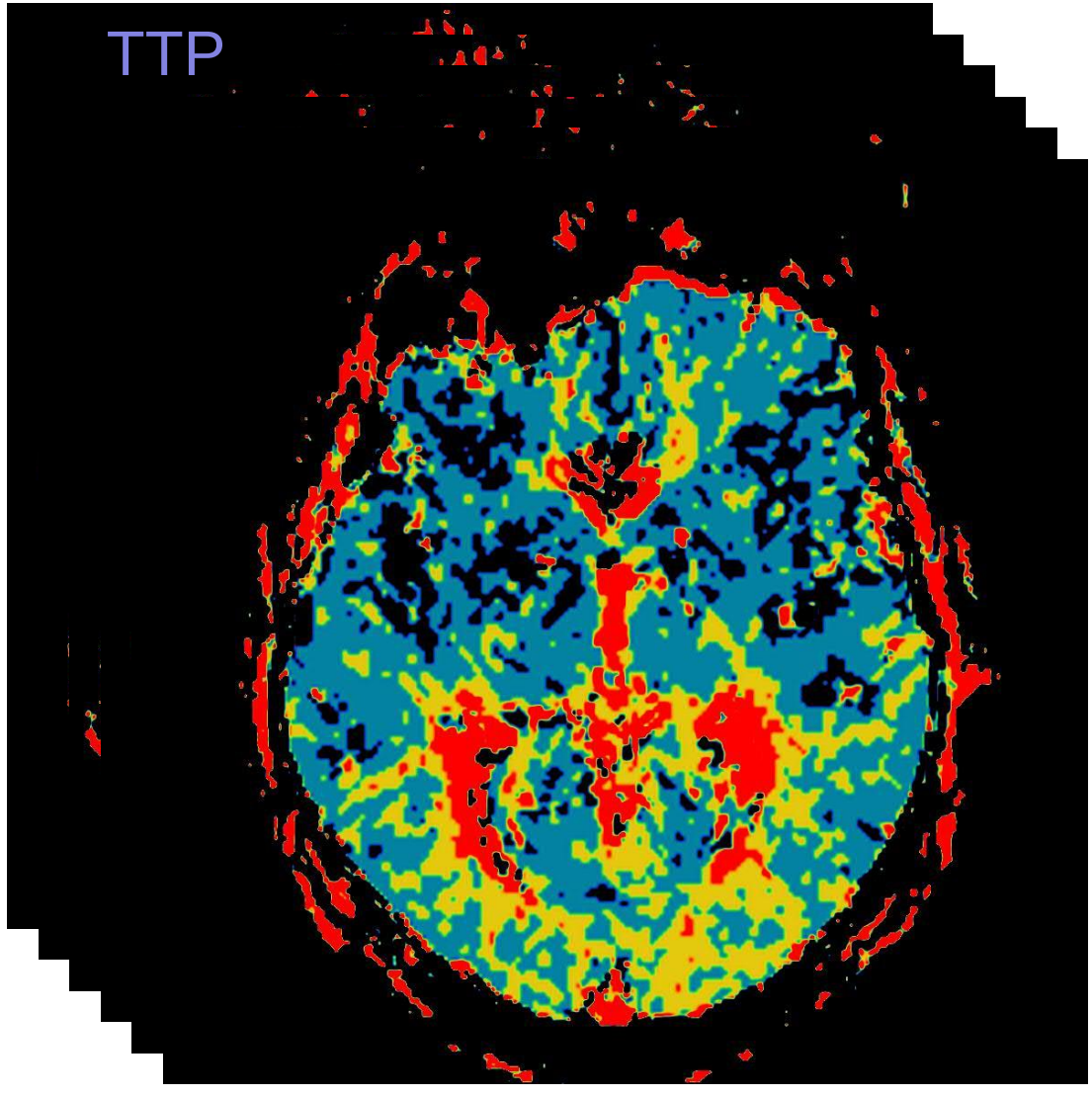


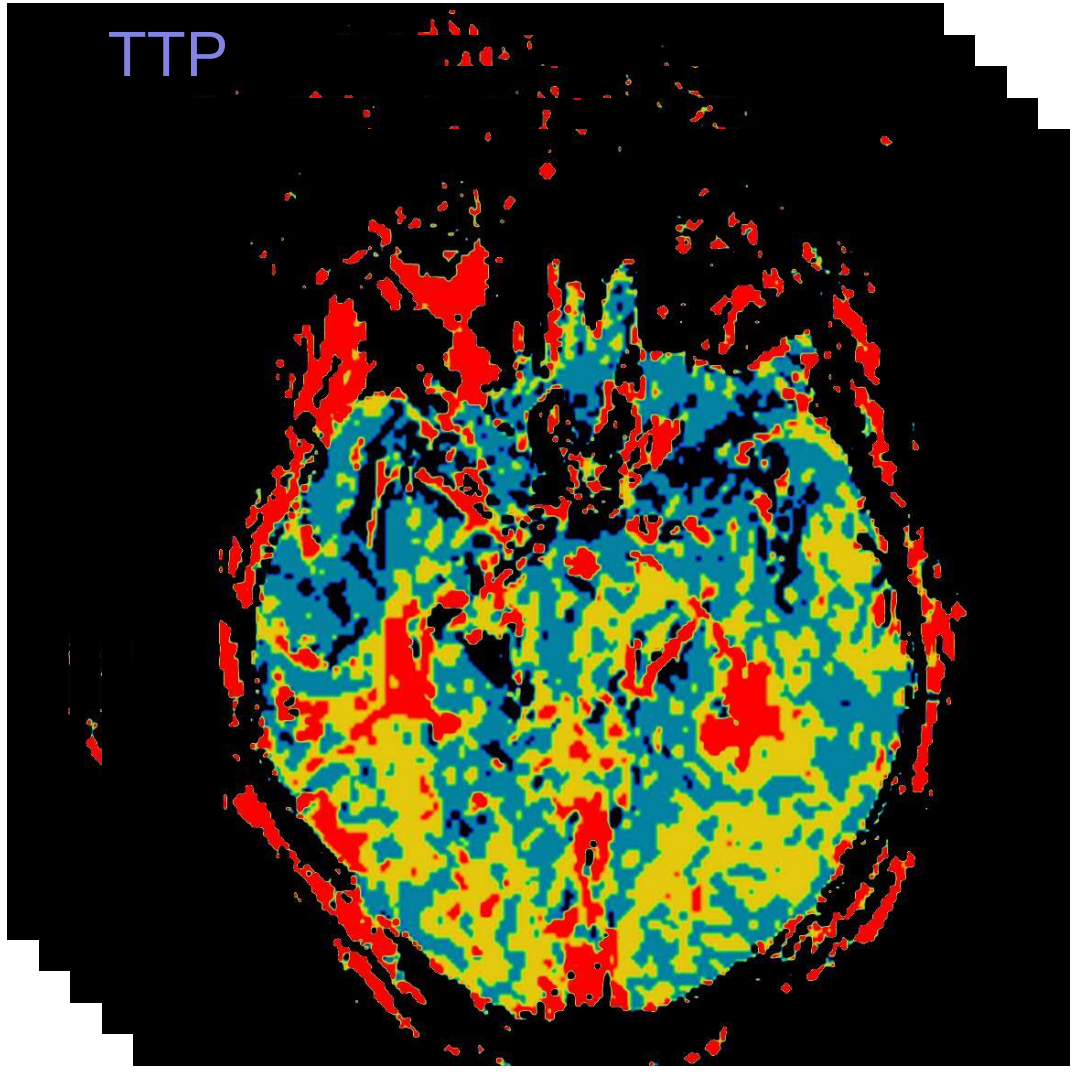

Left MCA +




Left PCA ++




Left PCA ++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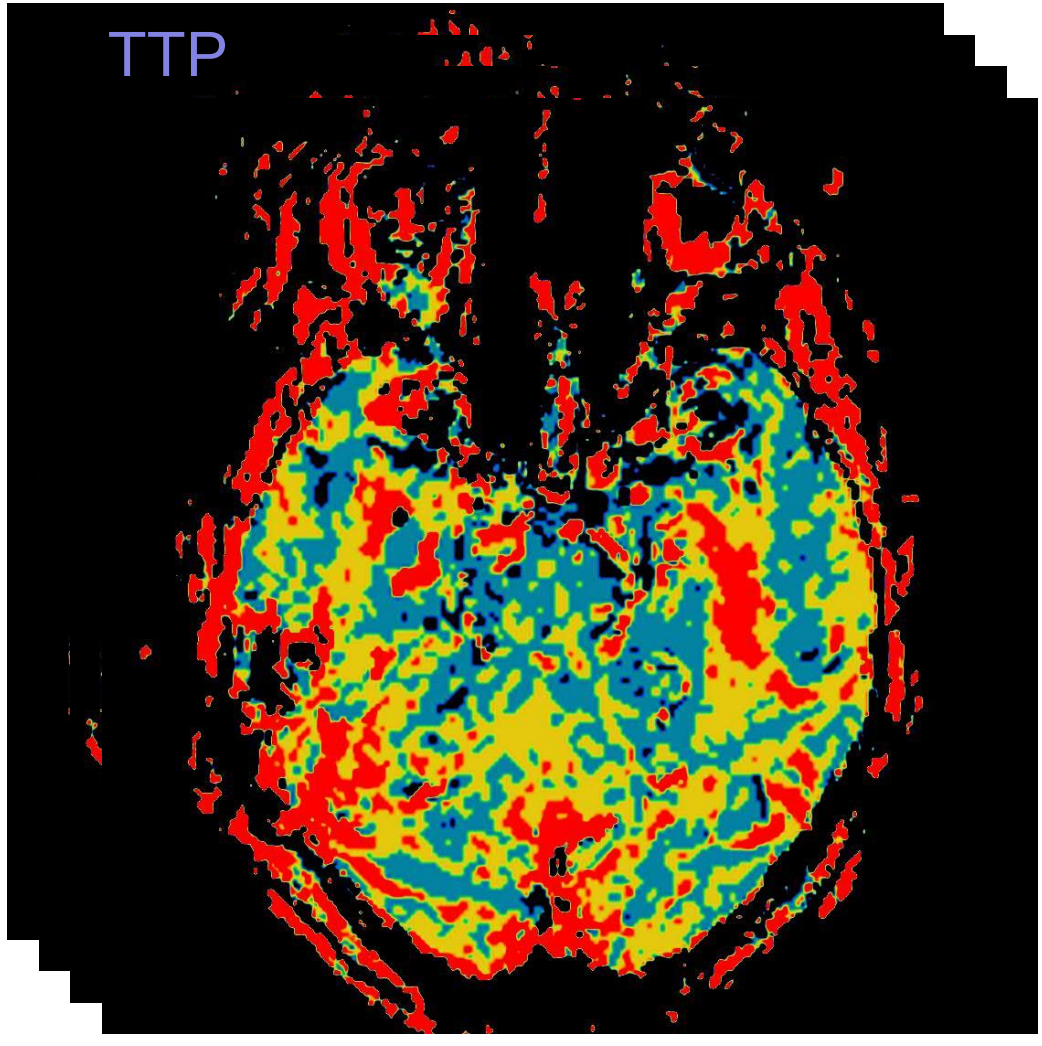
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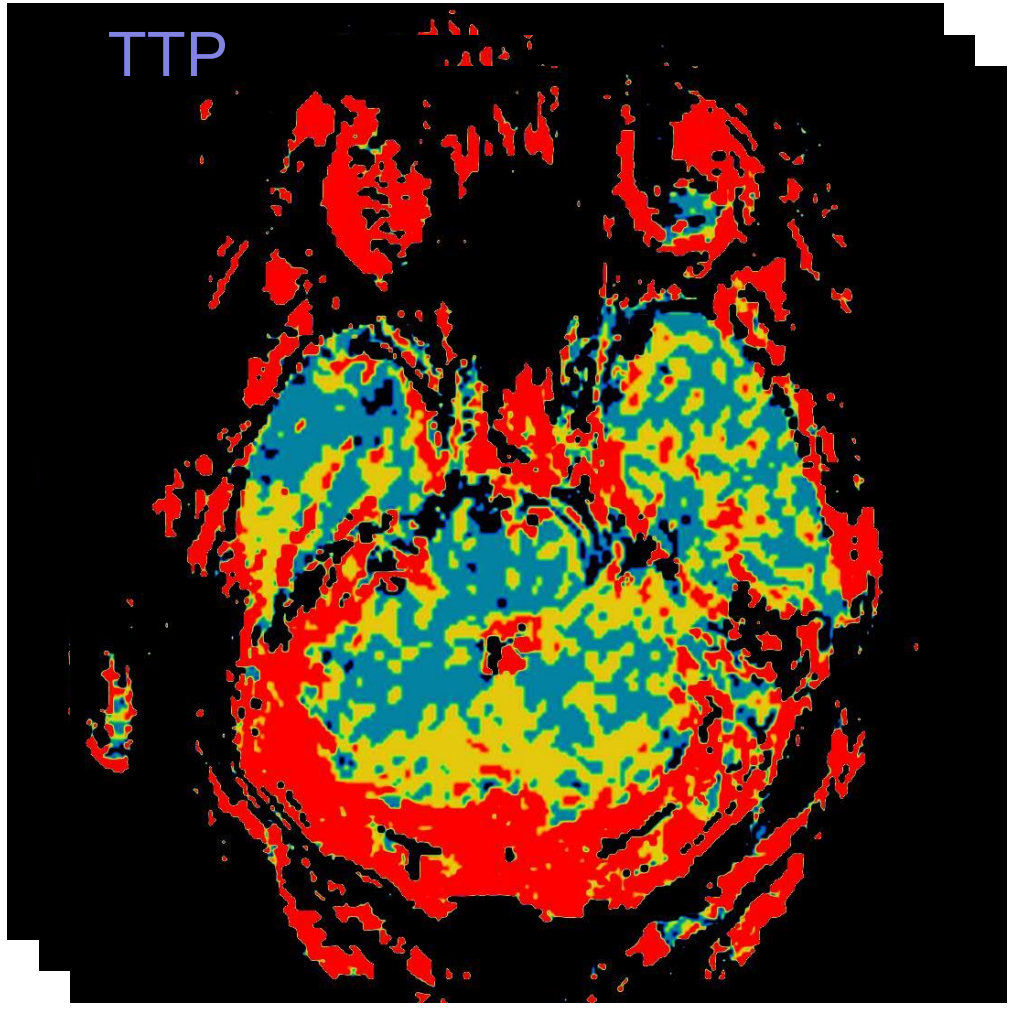
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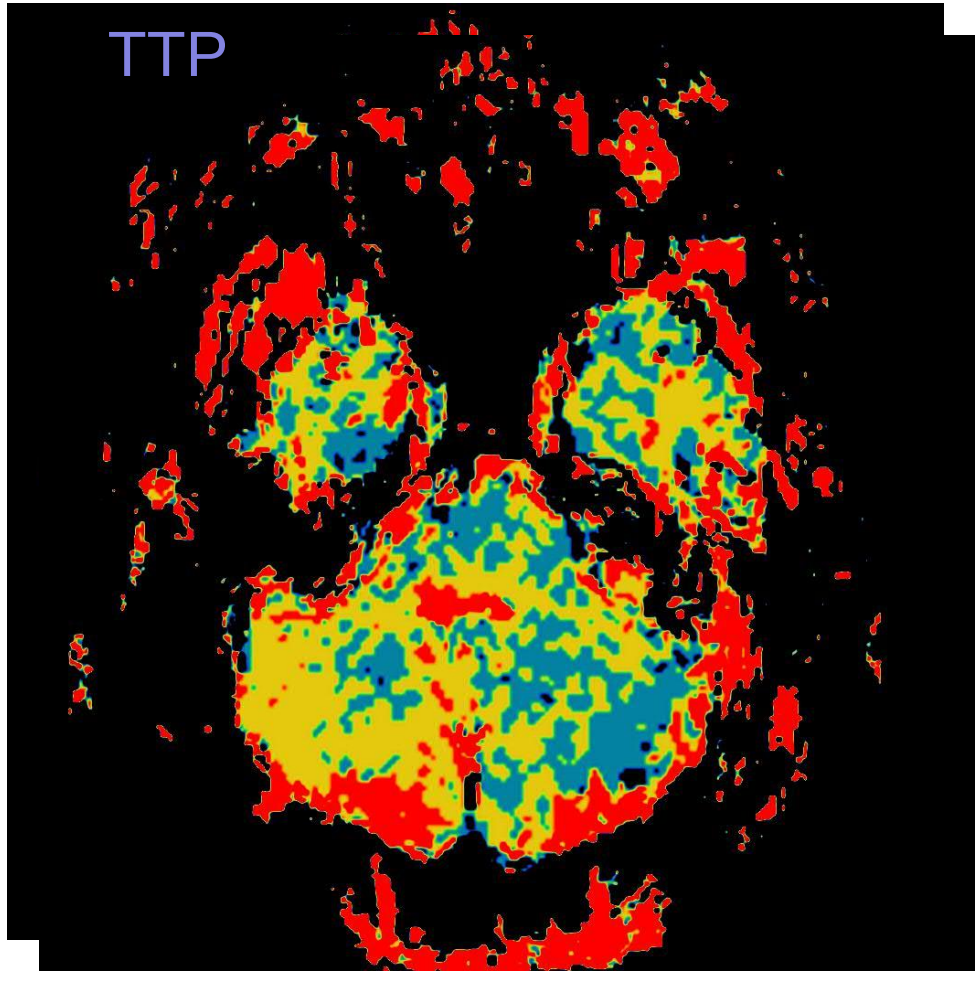
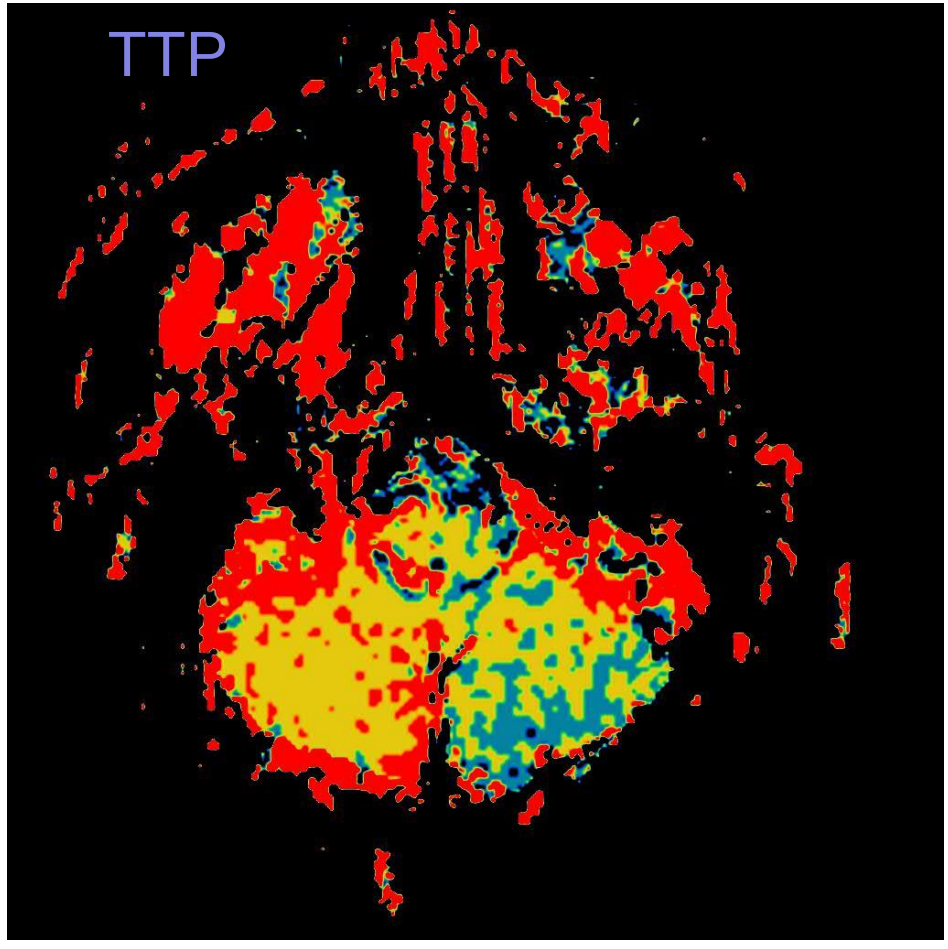
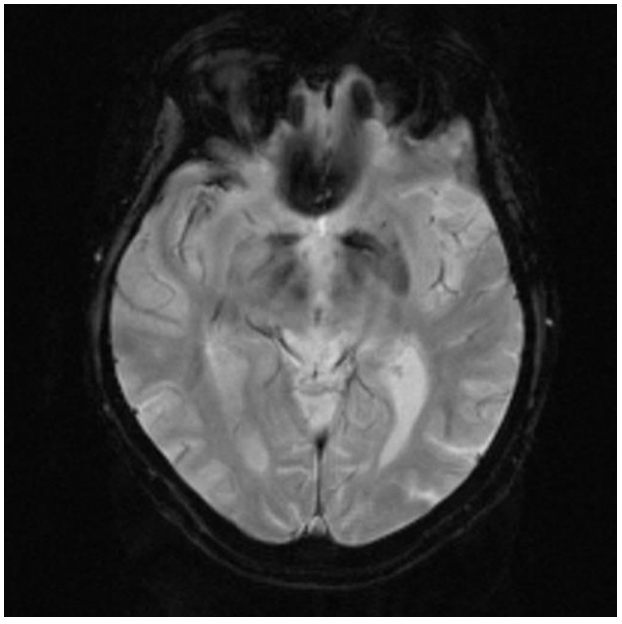
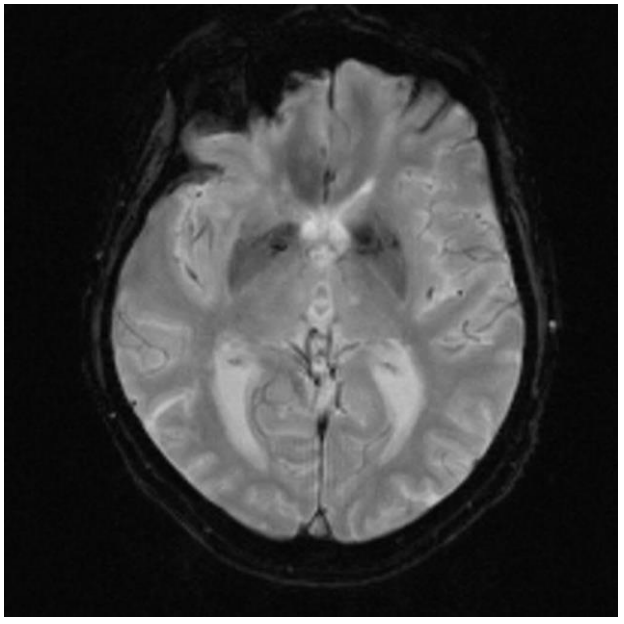
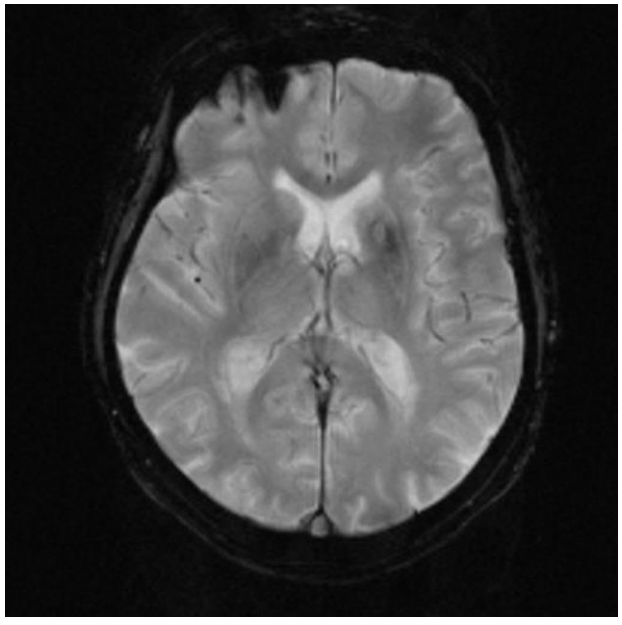


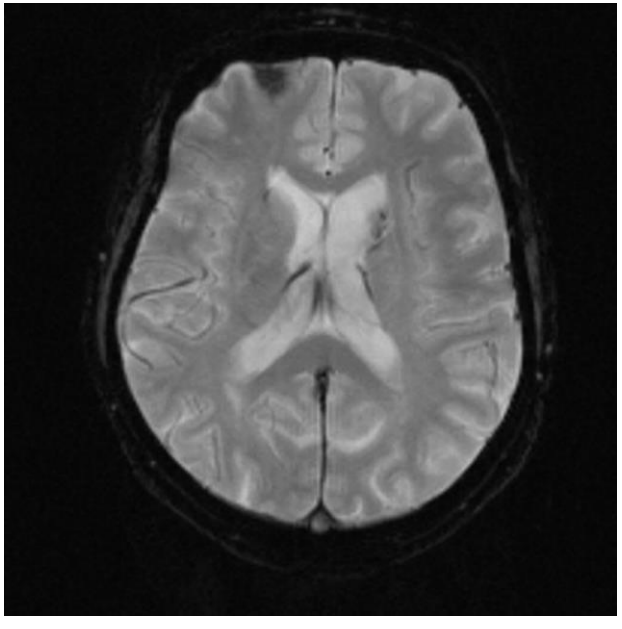
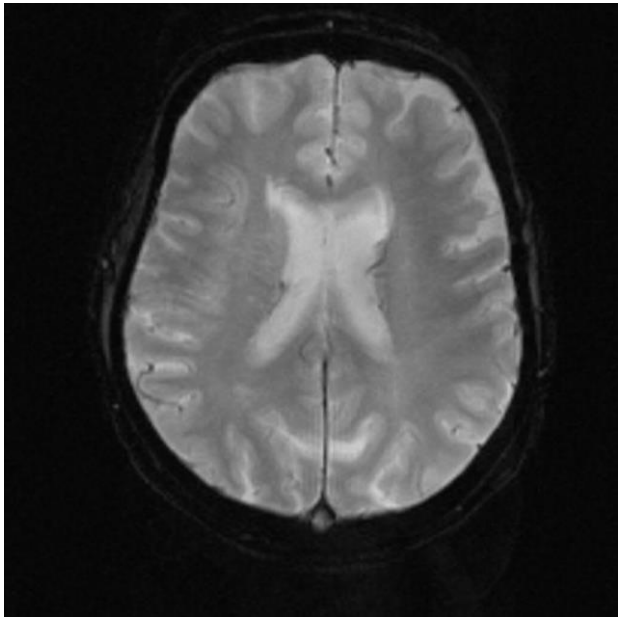
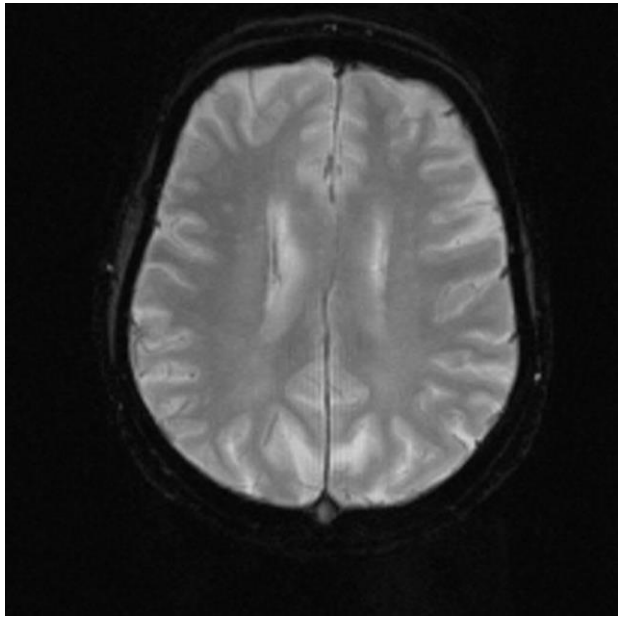

Right PICA ++

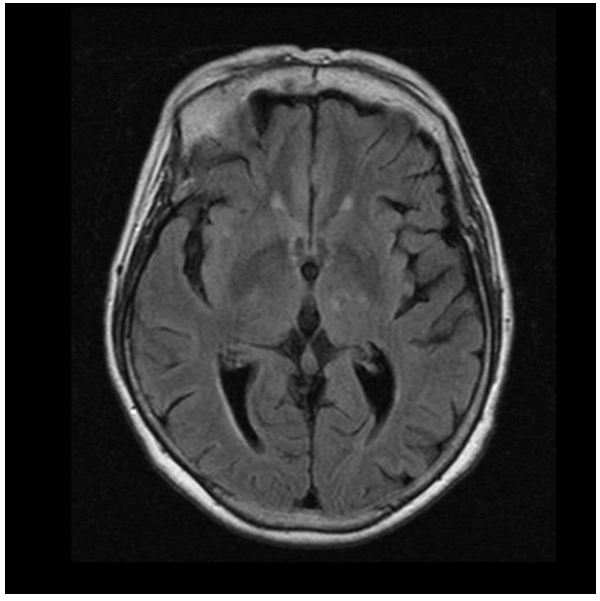
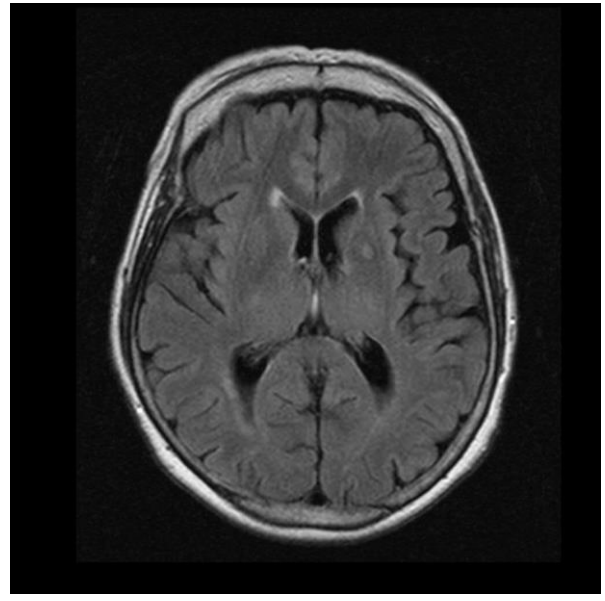
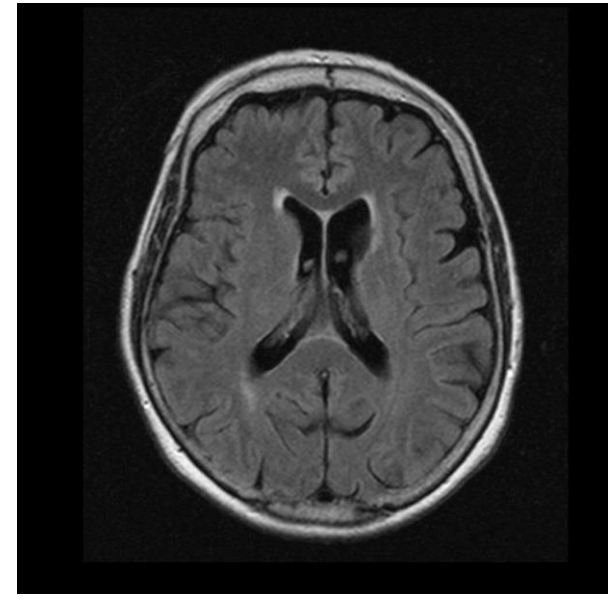



Right PICA ++

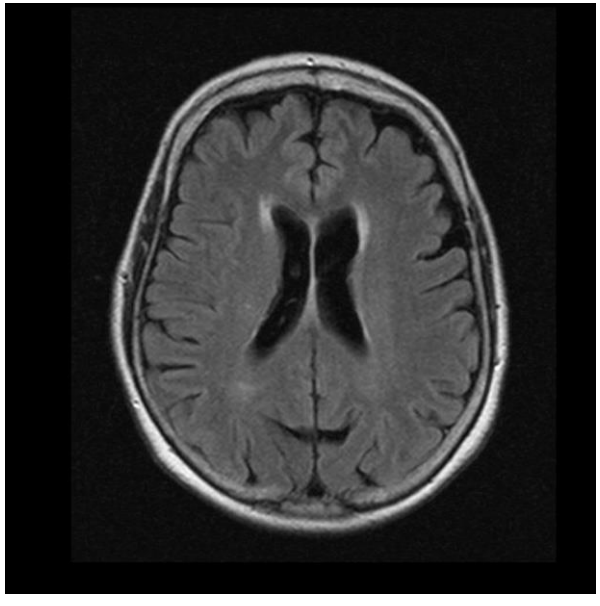
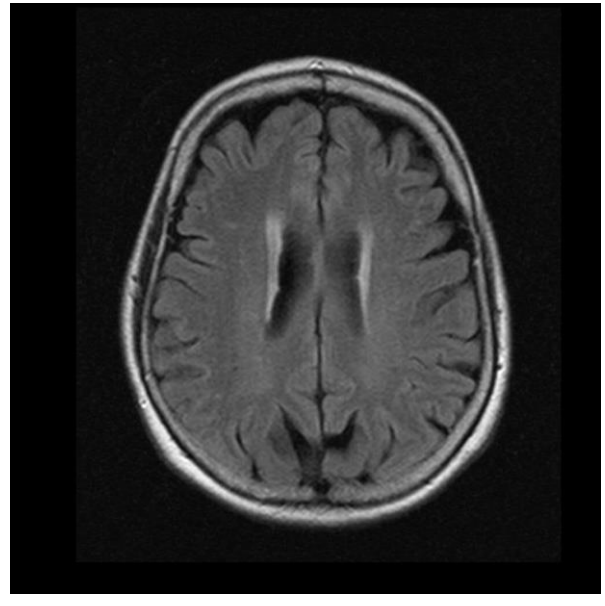
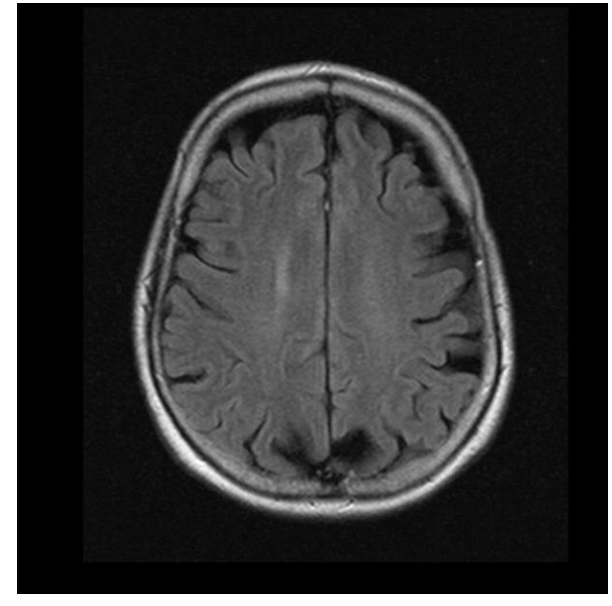




T2*

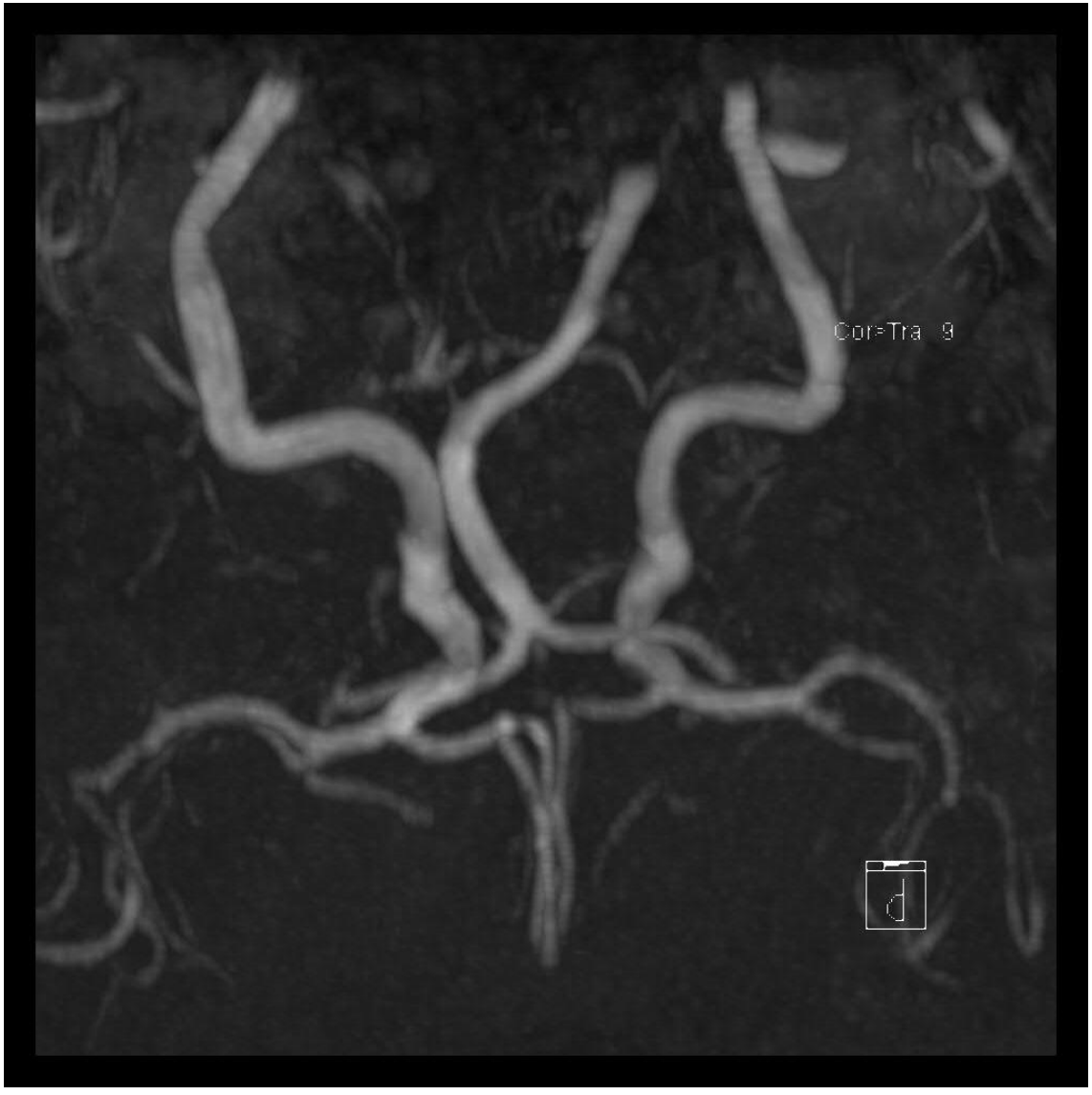




FLAIR


Cor-Tra -6


Cor=Tra 9


Cor+Tra 24
F


Cor>Tra 39
F
d


Tra>Cor 36
F
d


Tra>Cor 21
F


Tra>Cor 6
F


Tra=Cor -9
F


Tra-Cor-24
A
F


Tra>Cor-39
A
F


Cor>Tra-36
A
F


Cor>Tra-21


Cor+Tra -6
A


Sag>Cor -0
R

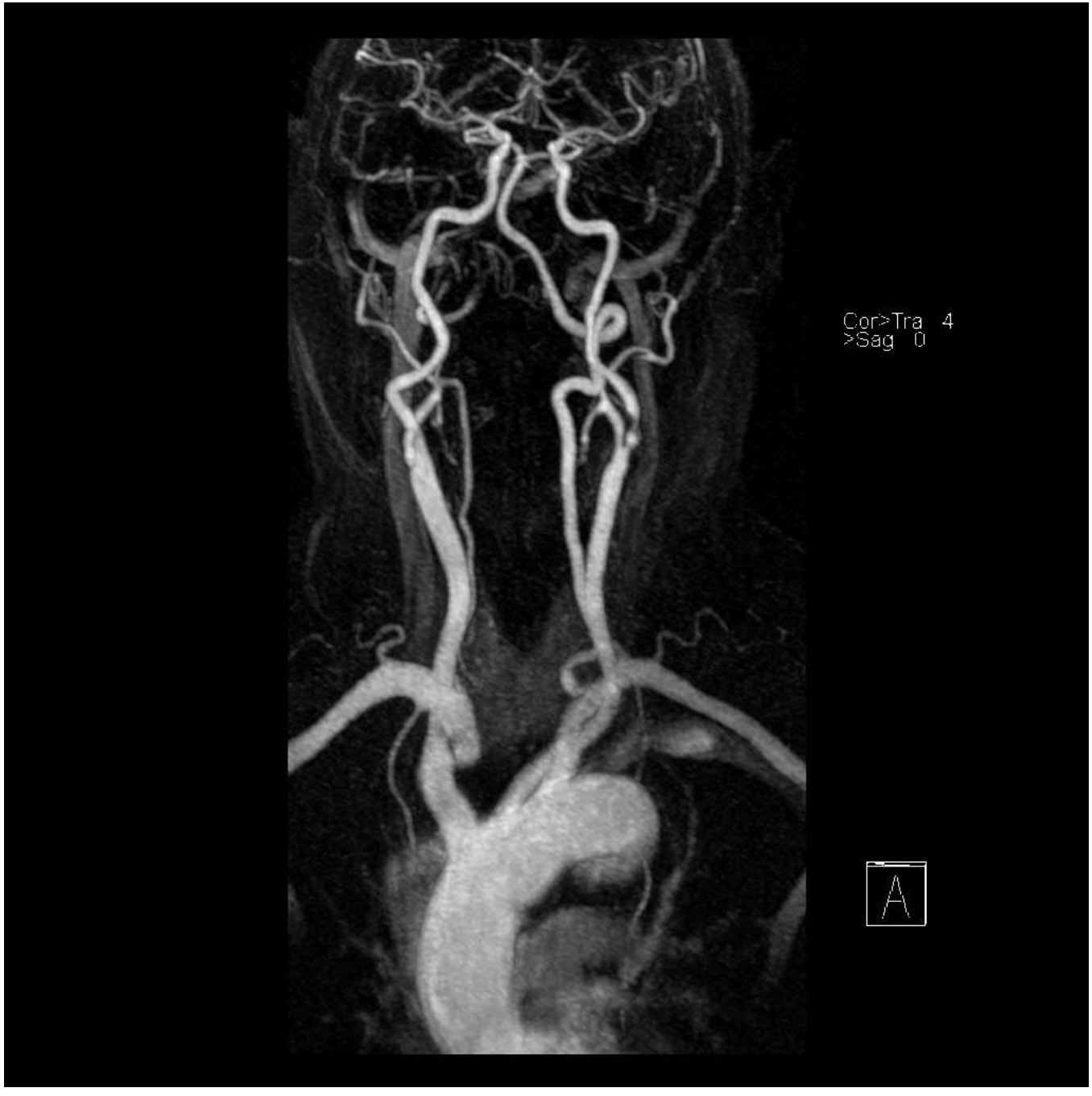

Sag>Cor -15
>Tra 1
R

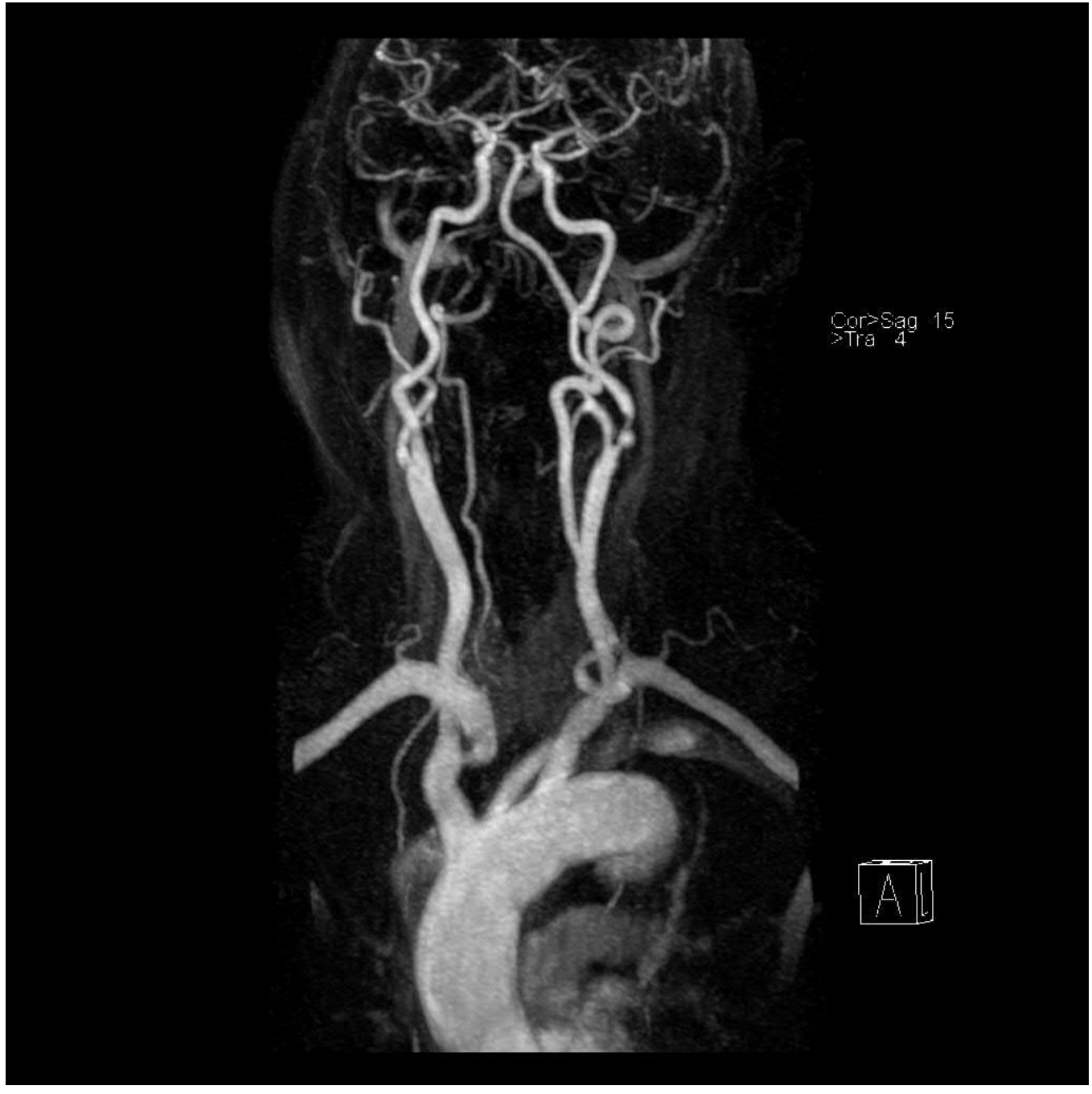

Sag>Cor -30
>Tra 2
R
A


Cor>Sag -45
>Tra 3
R
A


Cor>Sag -30
>Tra 4
R
A


Cor>Sag -15
>Tra 4
A


Cor>Tra 4
>Sag 0
A

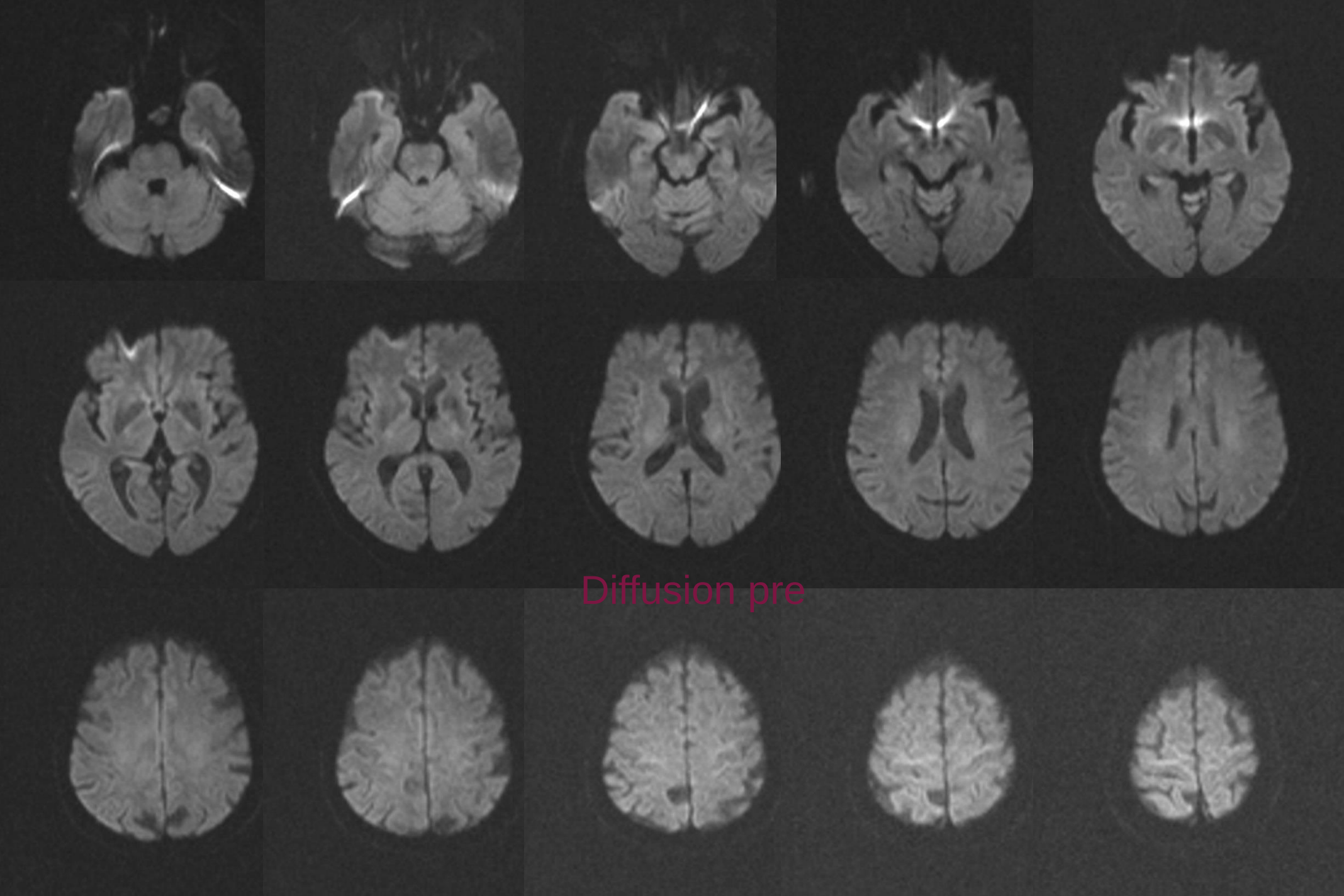

Cor>Sag 15
>Tra 4
A

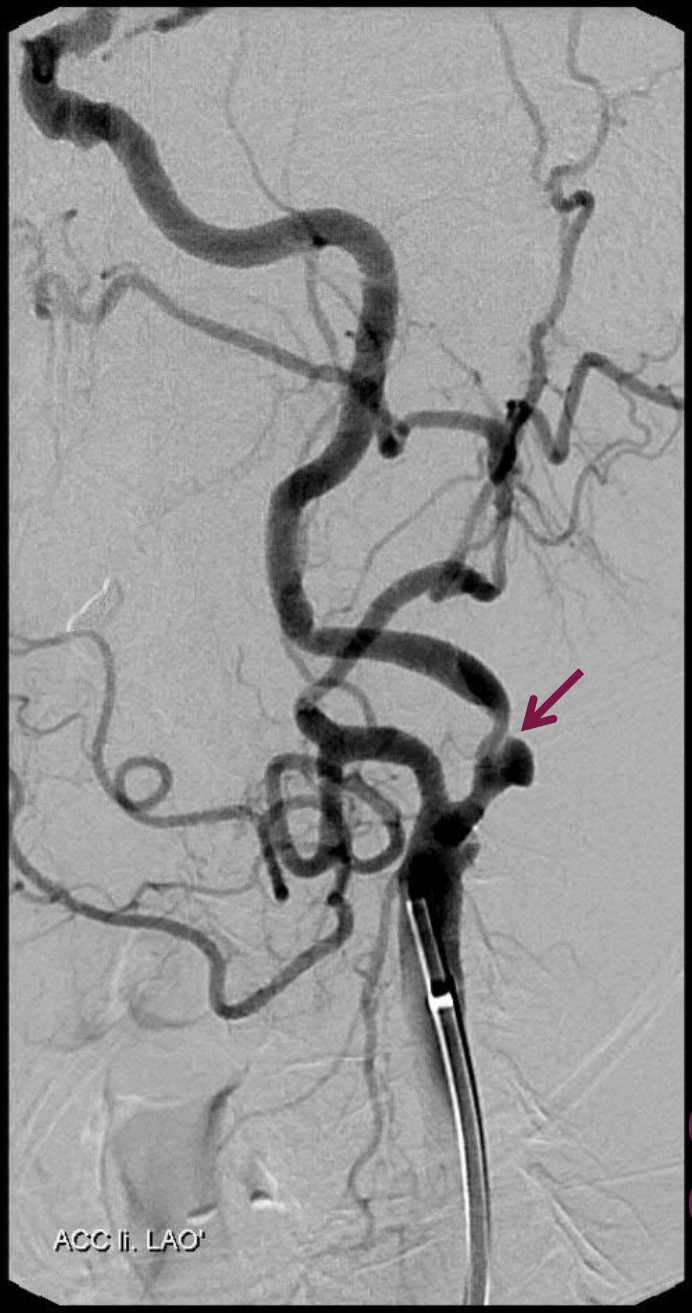

Cor>Sag 31
>Tra 4
A
L


Sag>Cor 44
>Tra -3
A
L

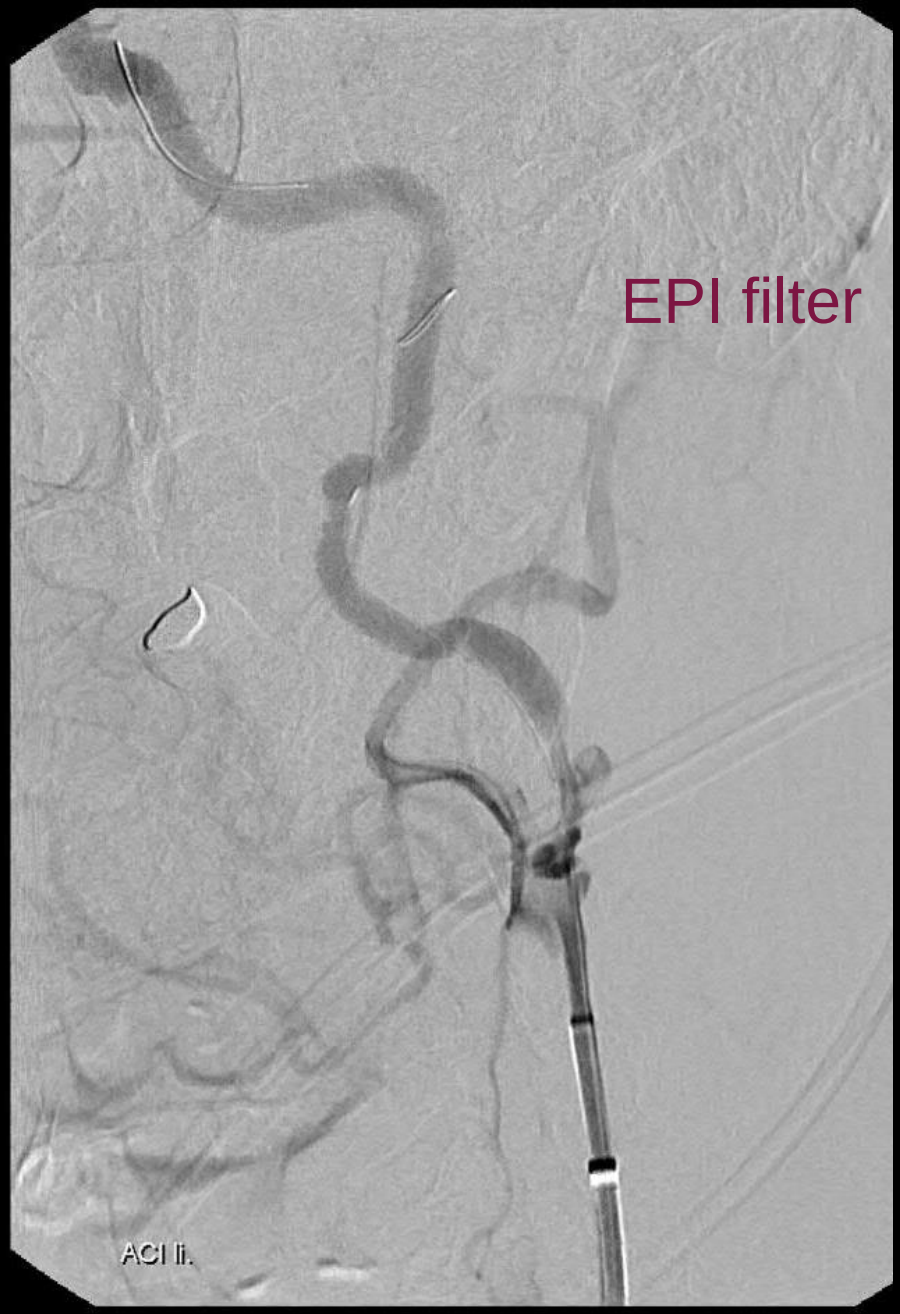

Sag>Cor 29
>Tra -2
A
L


Sag>Cor 15
>Tra -1


Diffusion pre

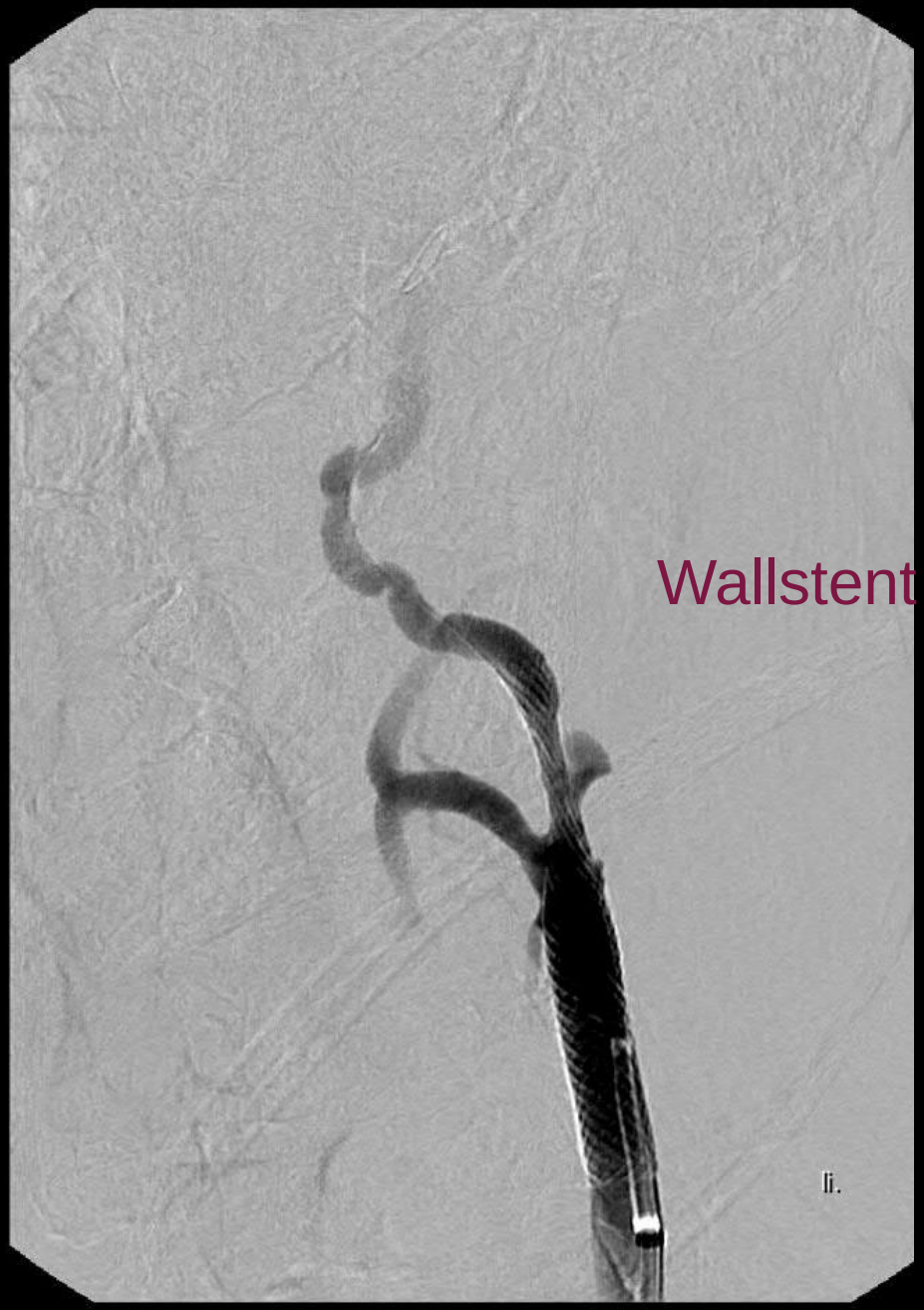



6F coaxial
6F sheath


EPI filter
ACI li.


ACI li.

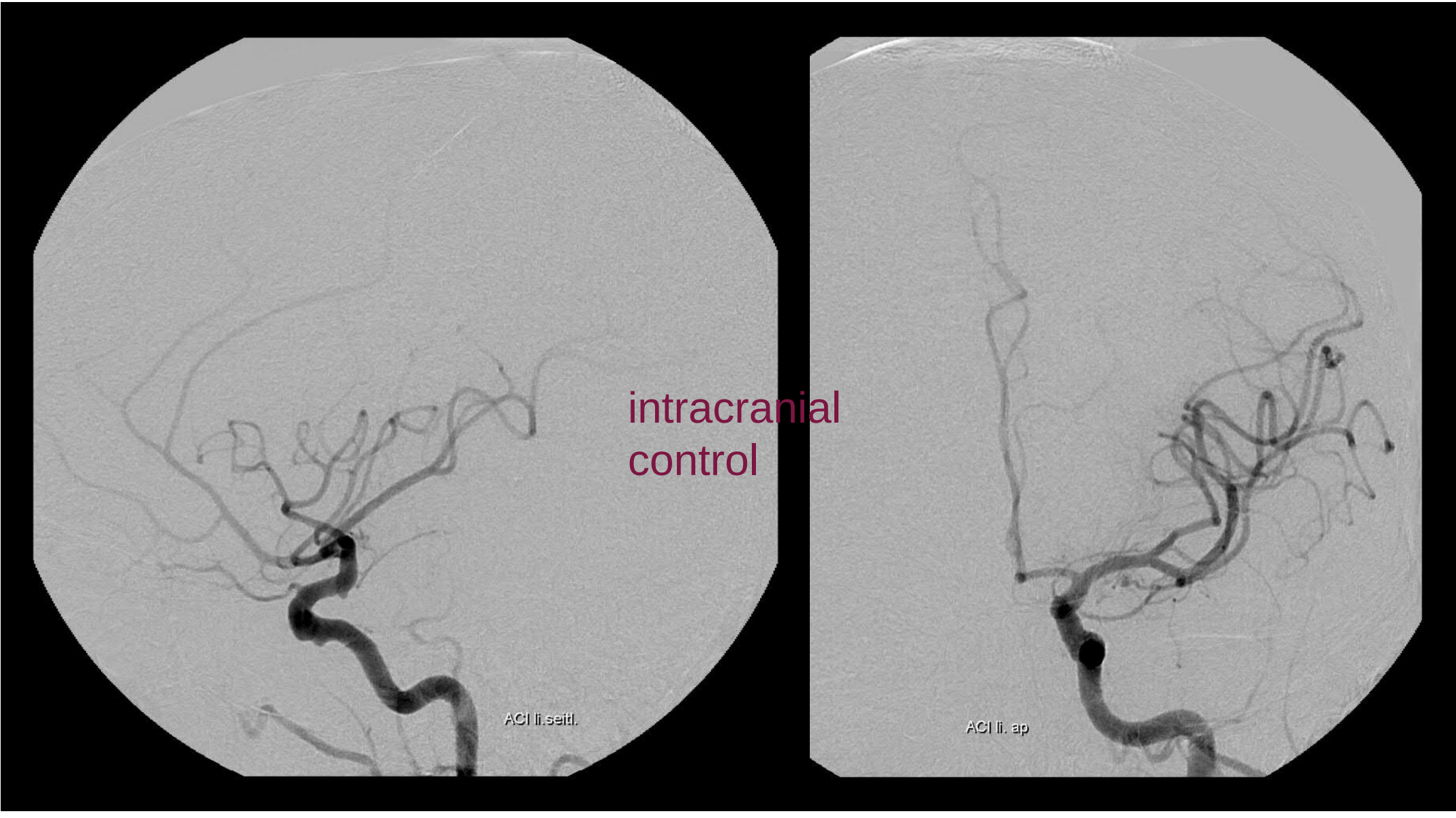
Wallstent 7 /40



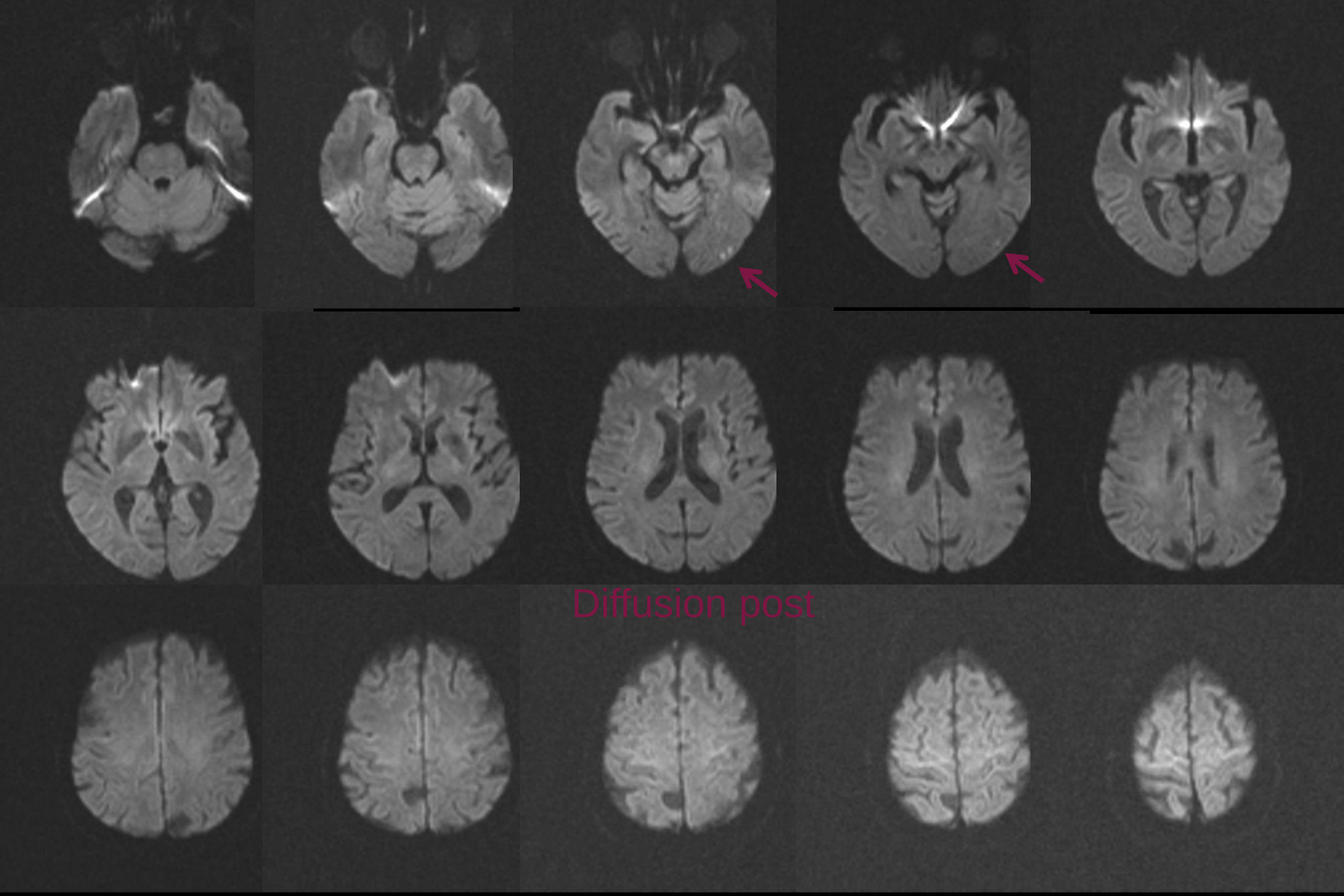


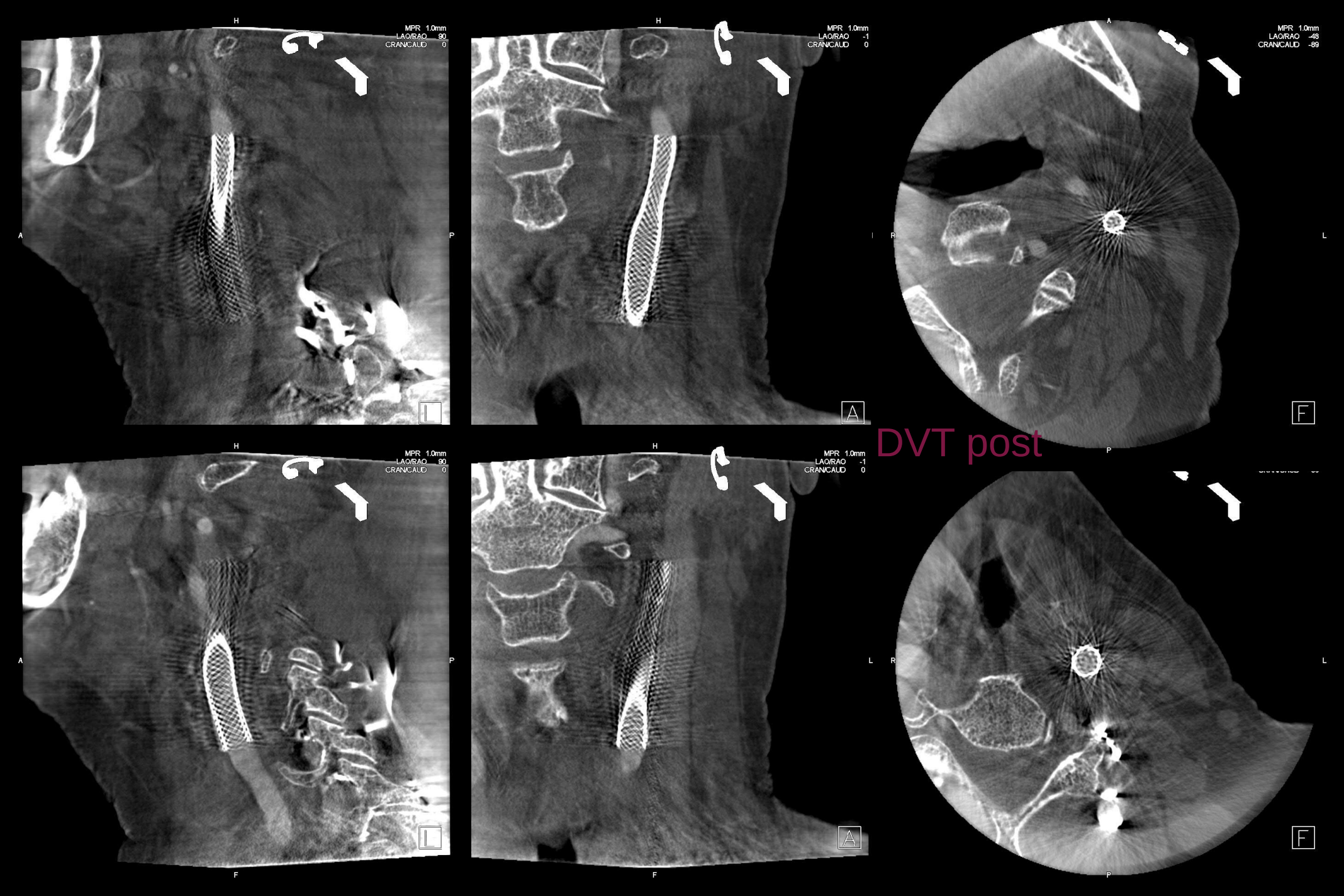
Maverick 5.5

result




intracranial
control


Diffusion post


MPR 1.0mm
LAO/RAO 90
CRAN/CAUD 0
MPR 1.0mm
LAO/RAO -1
CRAN/CAUD 0
MPR 1.0mm
LAO/RAO -48
CRAN/CAUD -89
DVT post
MPR 1.0mm
LAO/RAO 90
CRAN/CAUD 0
MPR 1.0mm
LAO/RAO -1
CRAN/CAUD 0

# Conclusion:

Carotid-Stenting with optimized filter protection seems to be safe

NIHSS can be improved by in time intervention

Considerably new DWI lesions are arosen