

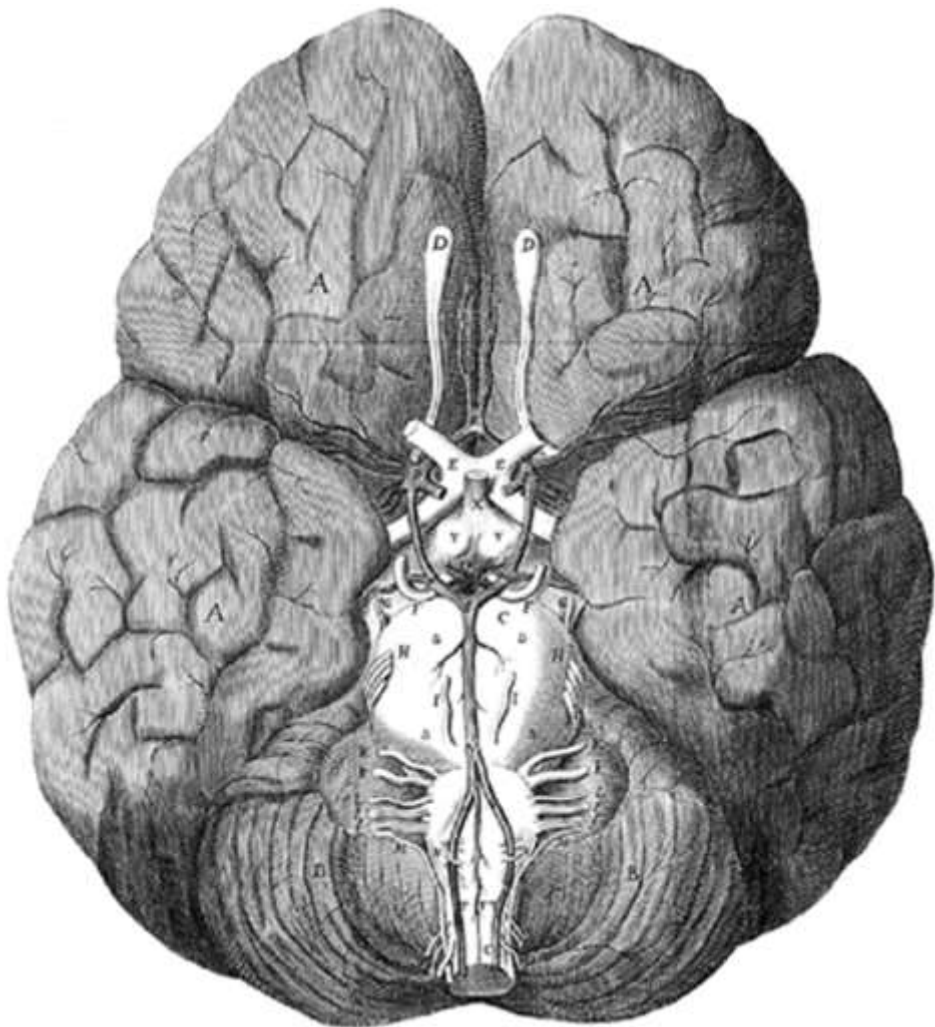
Cévy mozku.

Robert Bartoš, Veronika Němcová



Anatomický ústav 1. LF UK
Neurochirurgická klinika
MNUL a UJEP

Thomas Willis (1621–1675)



2% hmotnosti těla x 20% perfúze a 20% konsumpce O₂
Noradrenalin (pleteně ggl. cervicale superius) - vasokonstrikce
Nitrinerní systém (acetylcholin, NO-S,NO) = vasodilatace (CO₂)
Hematoencefalická bariéra (tight junctions, BM, glie: end feets)

Cévy mozku

Z ARTERIA CAROTIS INTERNA

Z ARTERIA VERTEBRALIS

Circulus arteriosus Willisii

Tepny **1) korové**
2) centrální (perforátory)
3) choroidální

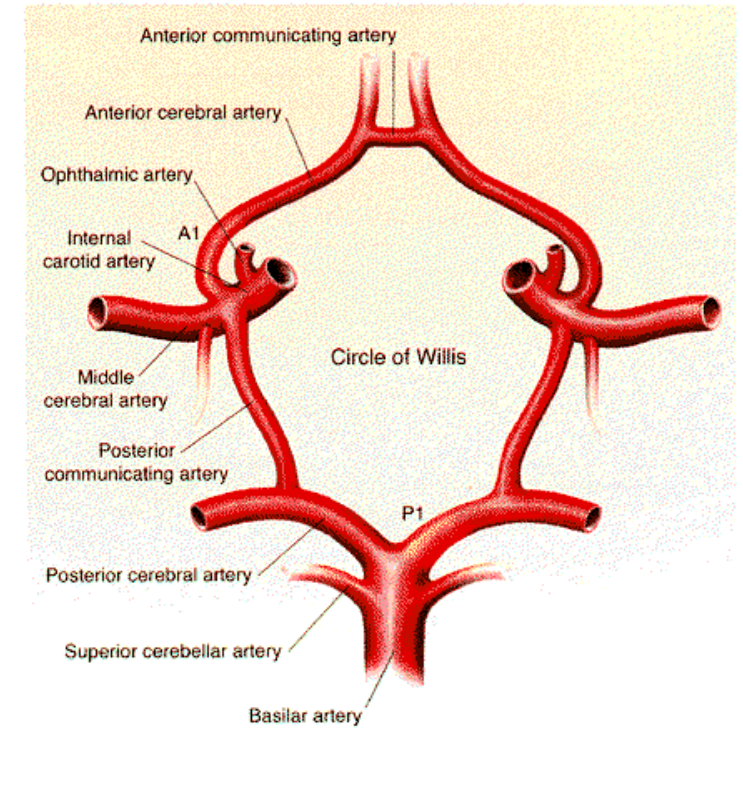
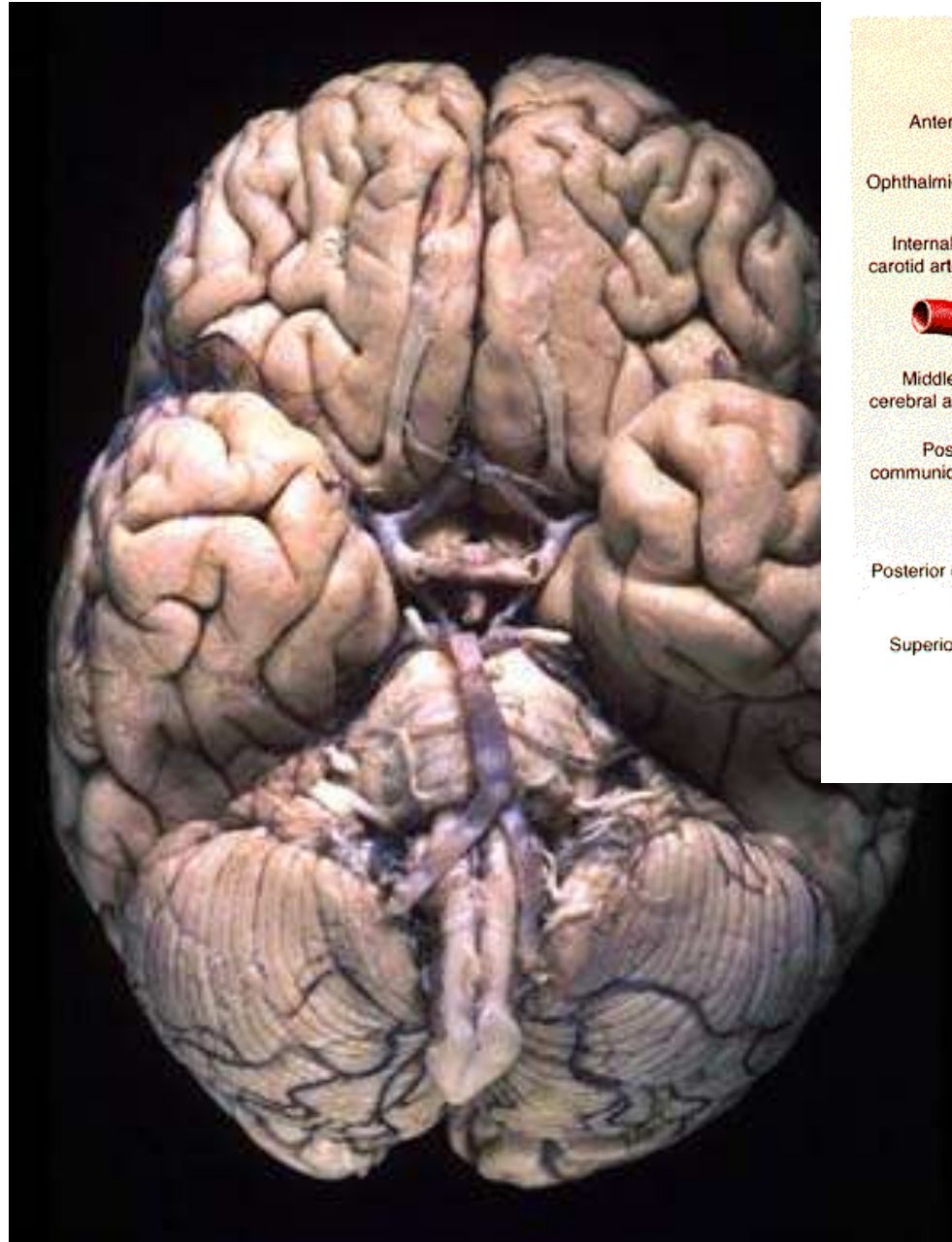
Arteriae centrales- skupiny:

Anteromediální

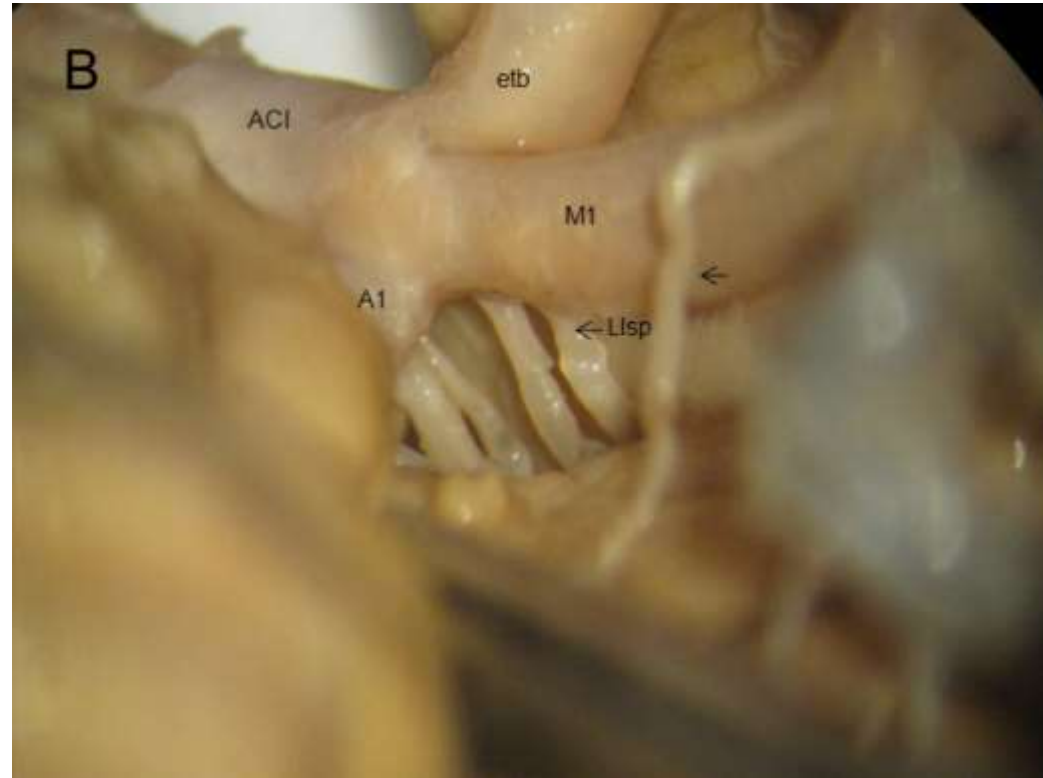
Anterolaterální

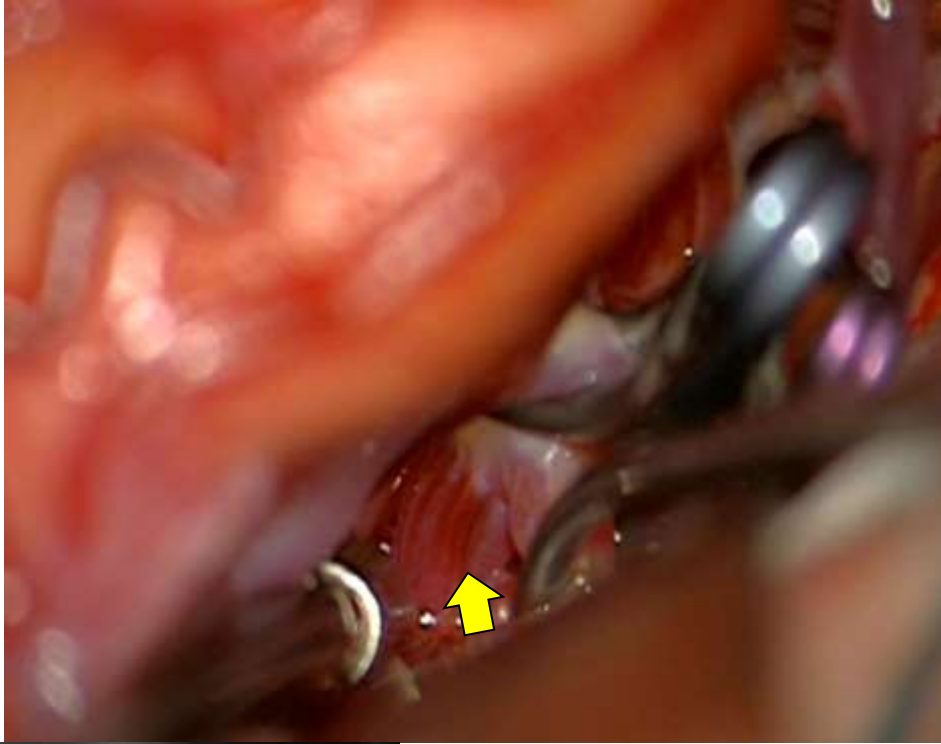
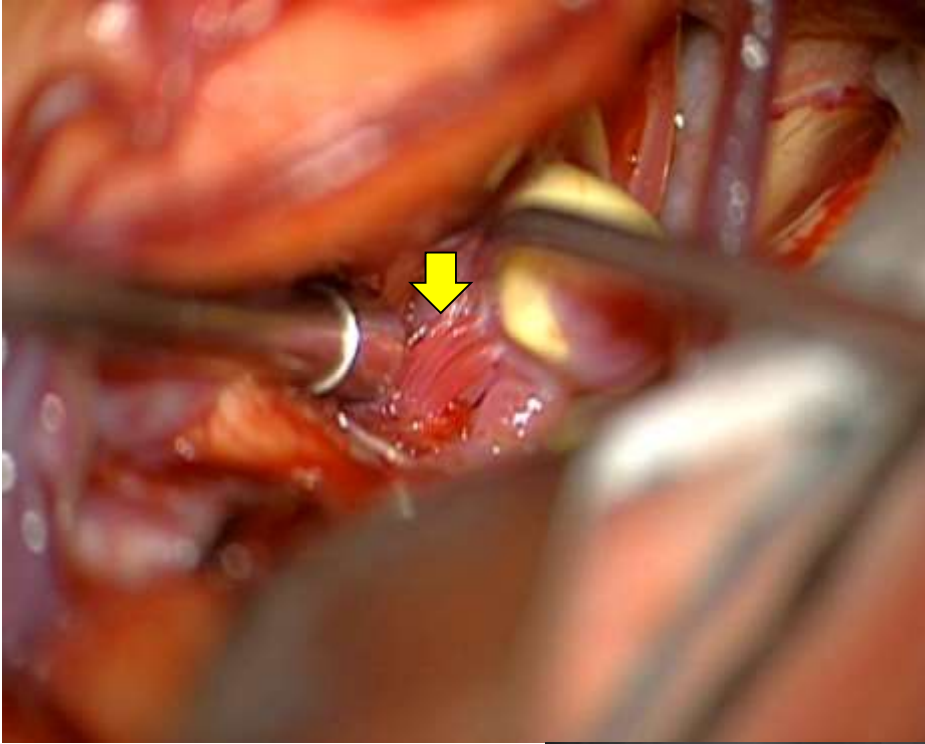
Posteromediální

Posterolaterální

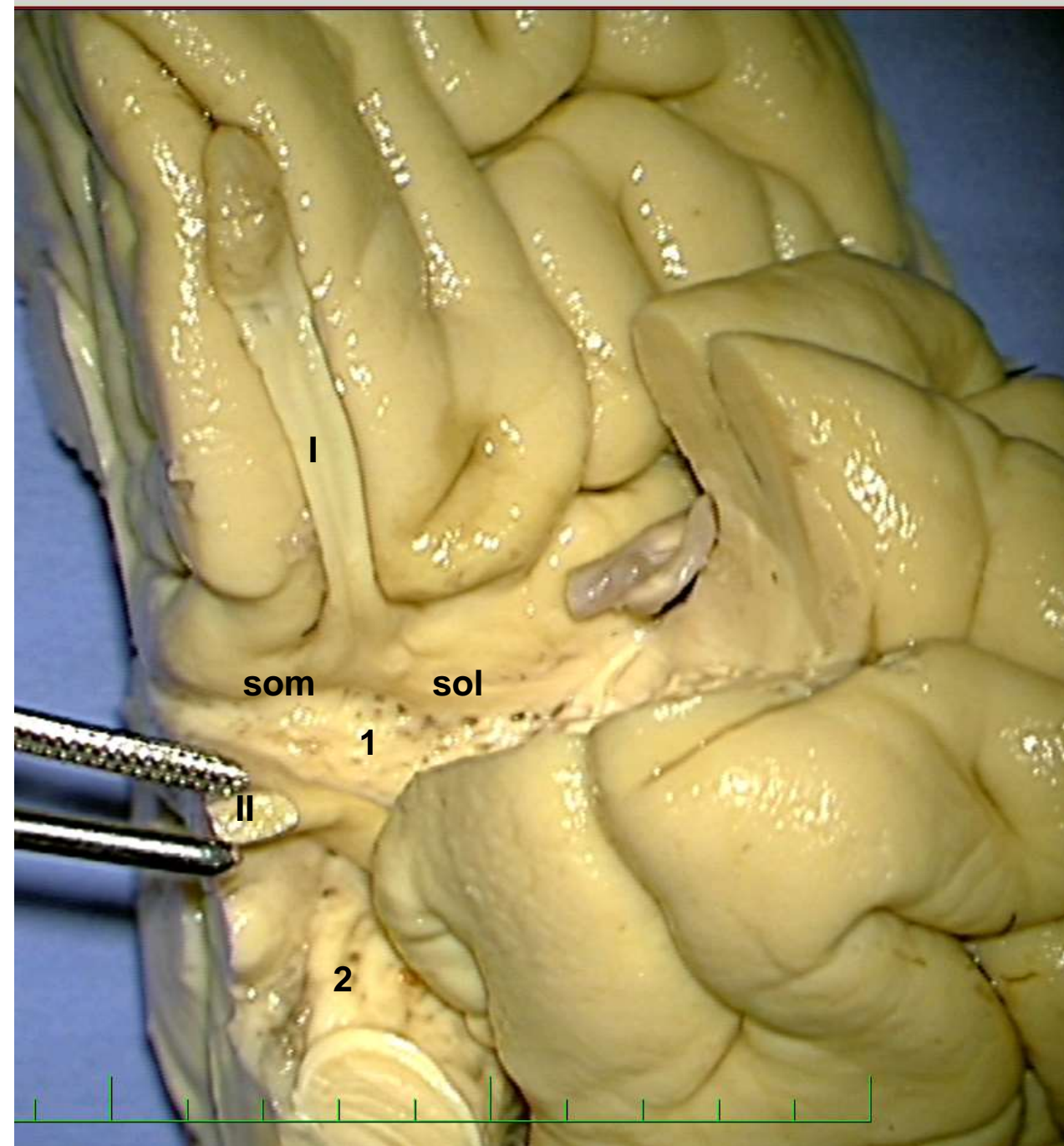
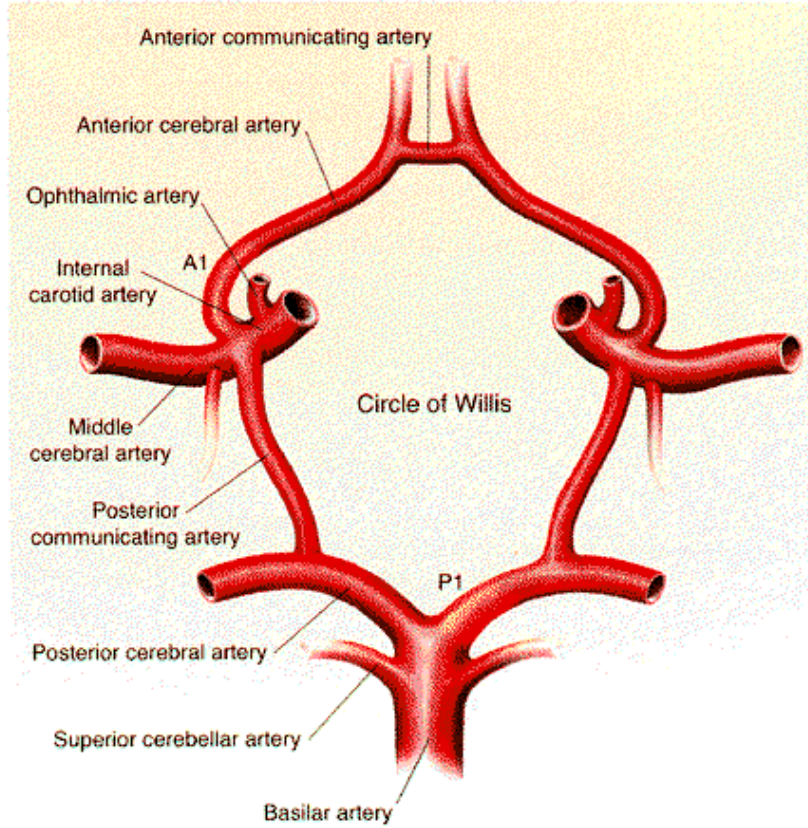


Laterální lentikulostriatické perforátory





Pohled na **area perfotata anterior** (1) ACI, ACA, ACM, AChA
a **area perforata posterior** (2) ACP

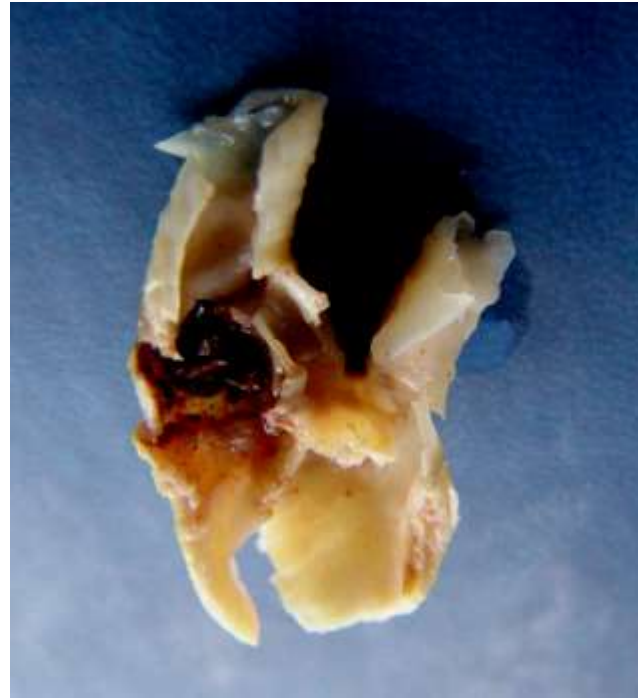


Arteriae centrales- skupiny:
Anteromediální
Anterolaterální
Posteromediální
Posterolaterální

ACI – sinus caroticus – AS - Ischemická CMP



**etiologie CMP 75-95%
embolizace**



A.carotis interna

C1 pars **cervicalis**

C2 pars **petrosa**

C3 pars **cavernosa** – tr. meningohypophysealis inf. (Bernasconi-Cassinari)

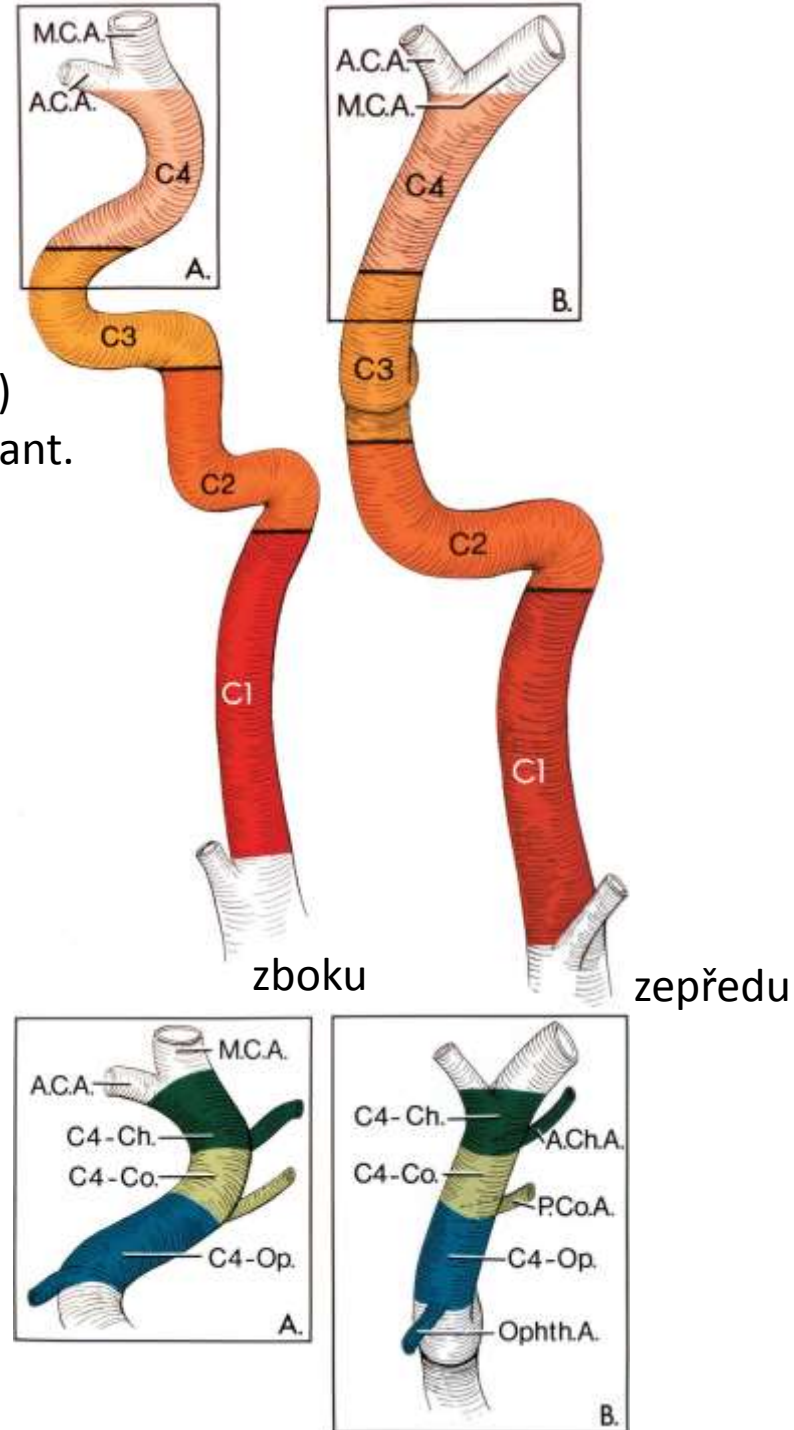
C4 pars **cerebralis** – laterálně od n. opticus, mediálně od proc. clinoides ant.

segmenty podle odstupu

a.ophtalmica

a. communicans posterior

a. choroidea anterior



C4

Ophtalmický segment:

n.II., chiasma *opticum*, tr. opticus, a. hypophysealis sup.

Komunikující segment:

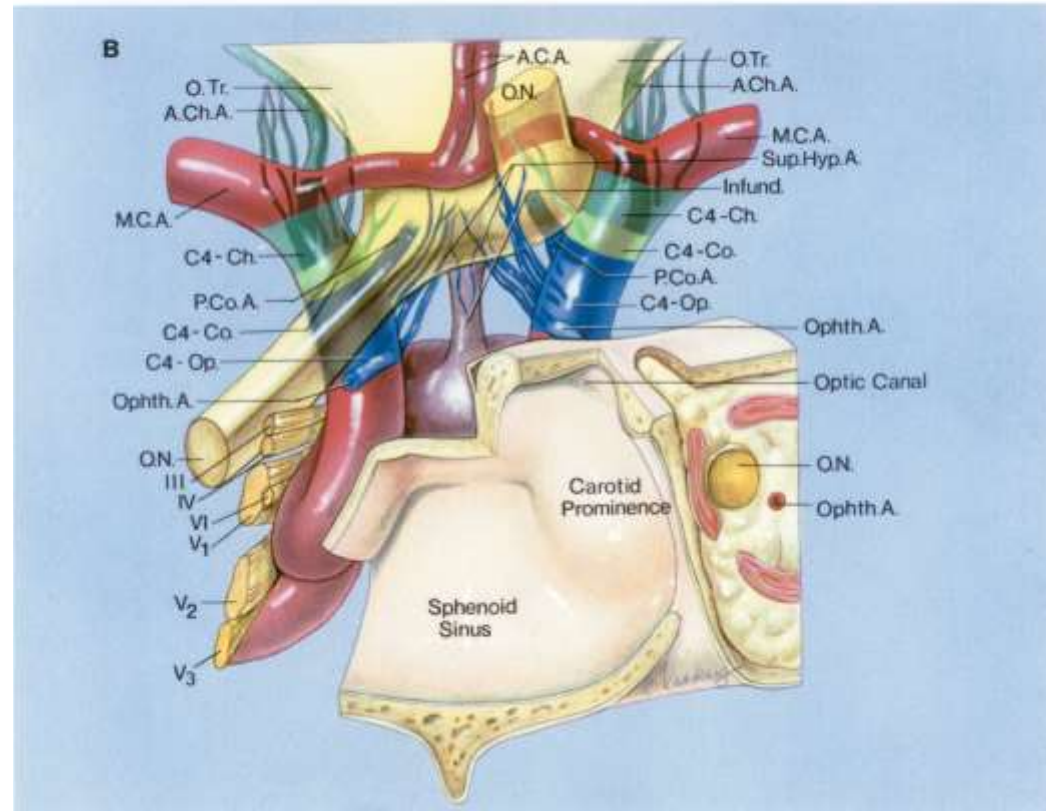
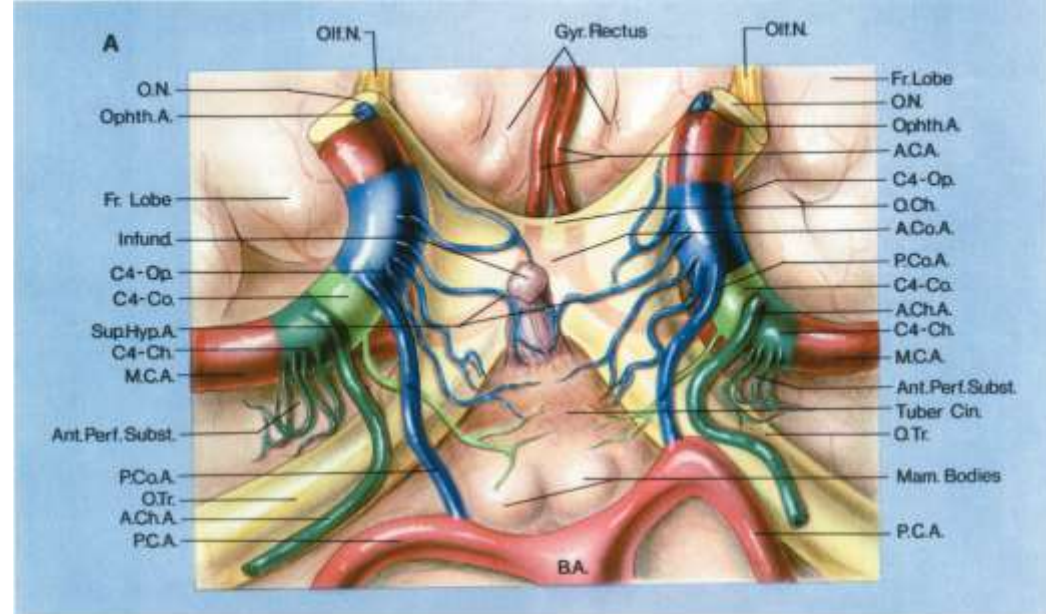
Spodina III. komory, tr. opticus, corpus mammillare

Choroideální segment

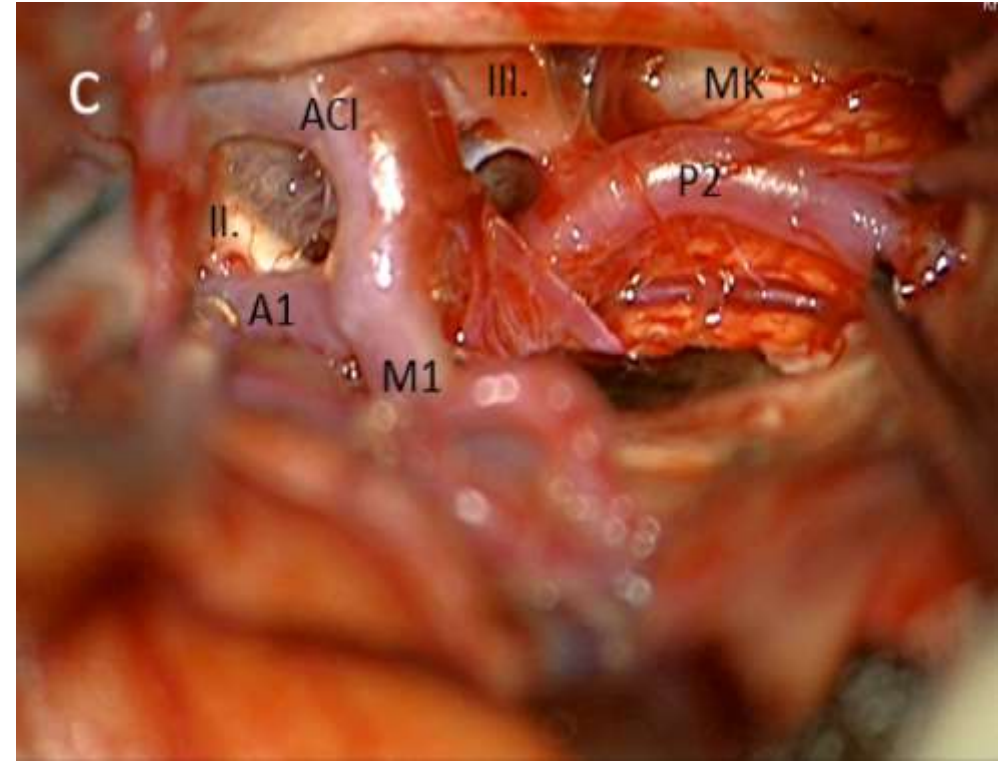
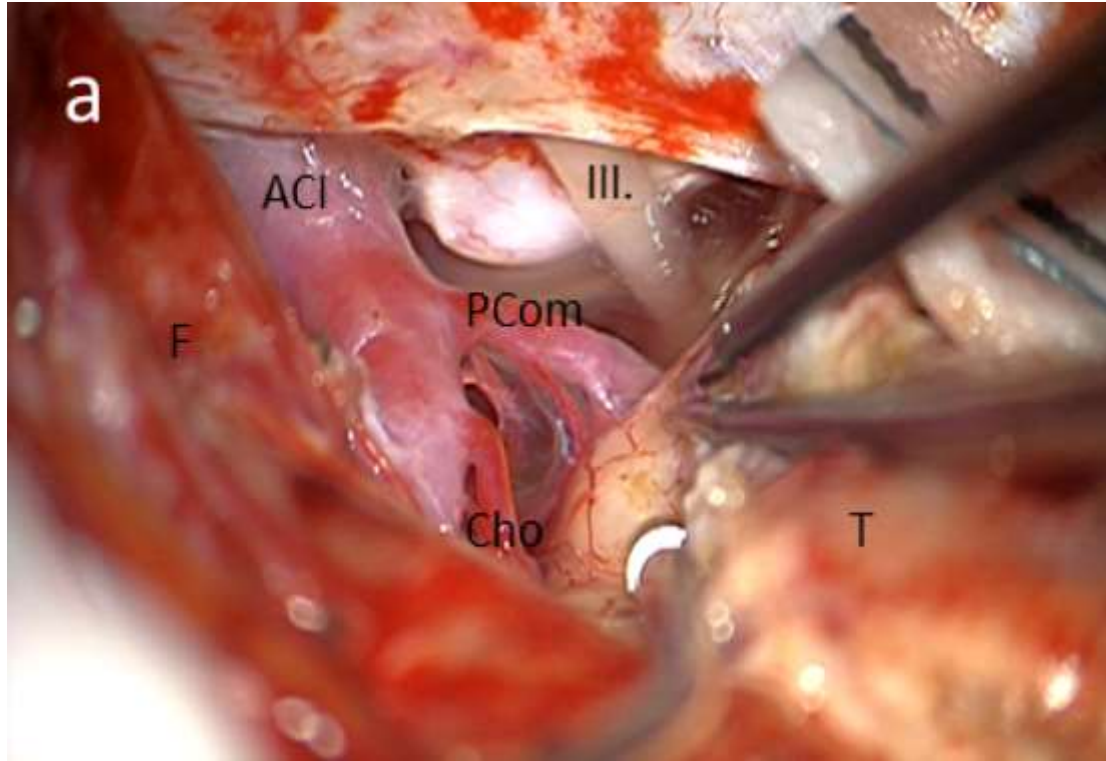
Substantia perforata anterior

Uzávěr **a. choroidea anterior**

kontralateralni hemiplegie, hemianestezie
a homonymni hemianopsie



ACI C4



Arteria cerebri media

M1- sphenoidální

M2 – inzulární

M3 – operkulární

M4 - kortikální

Horní a dolní kmen

Uzávěr horního:

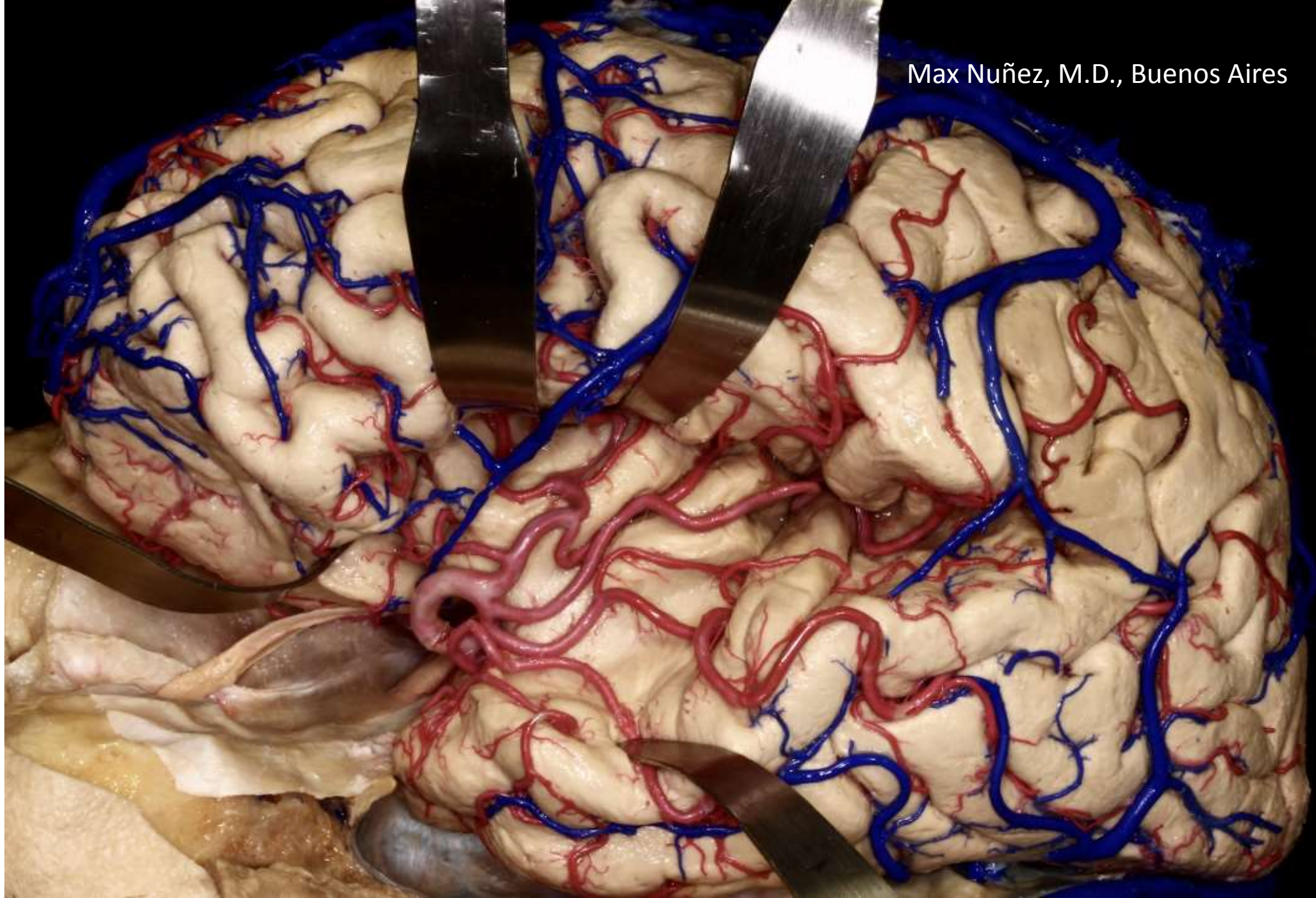
kontralaterální hemiplegie a hemianestezie
bez percepční aphasie v dominantní hemisféře

Uzávěr dolního:

Percepční aphasie **bez**
hemiplegie v dominantní hemisféře

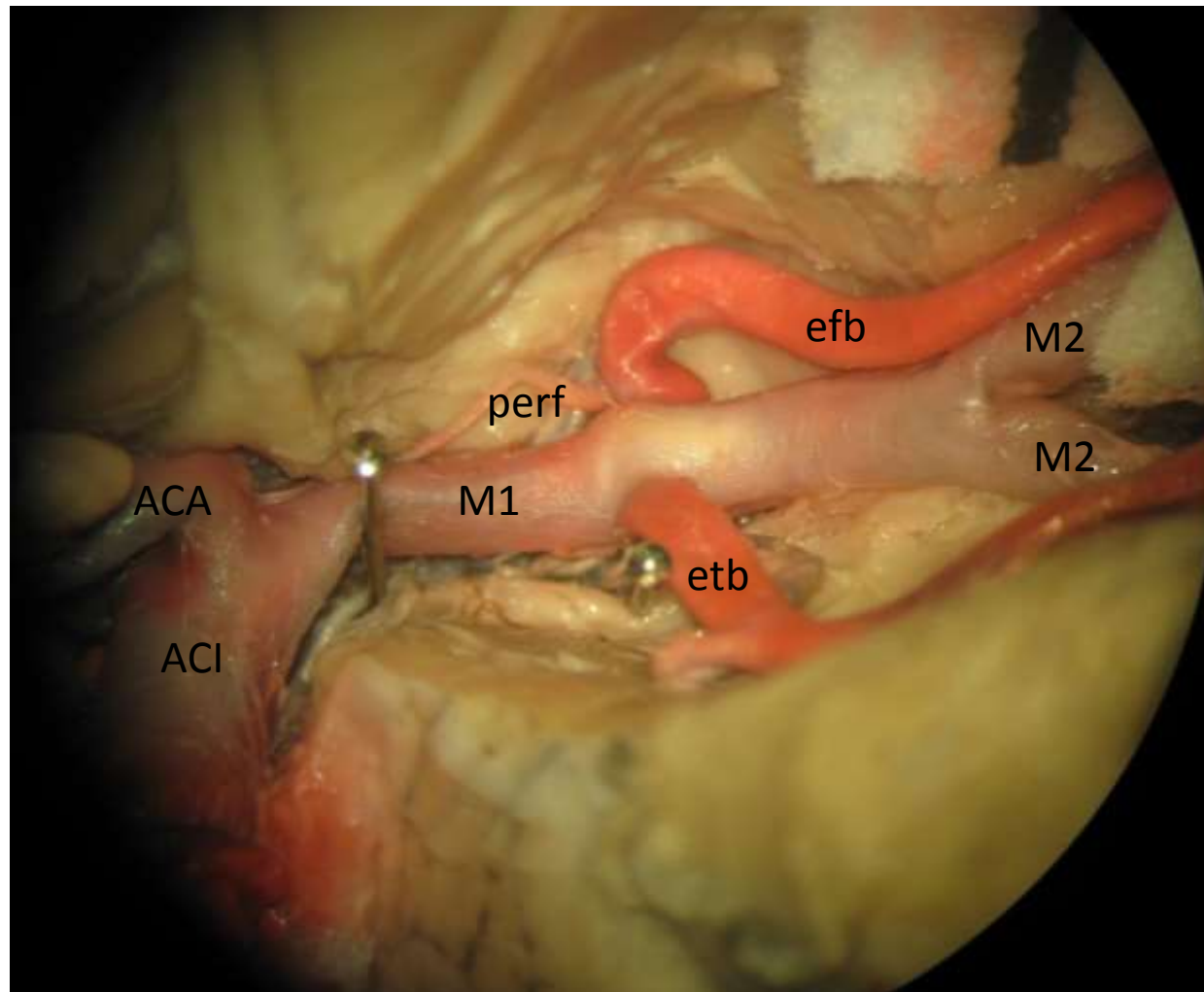


Max Nuñez, M.D., Buenos Aires



Arteria cerebri media:

„early“ frontal & temporal branch, perforatory, bifurkace M1/2



A. cerebri anterior

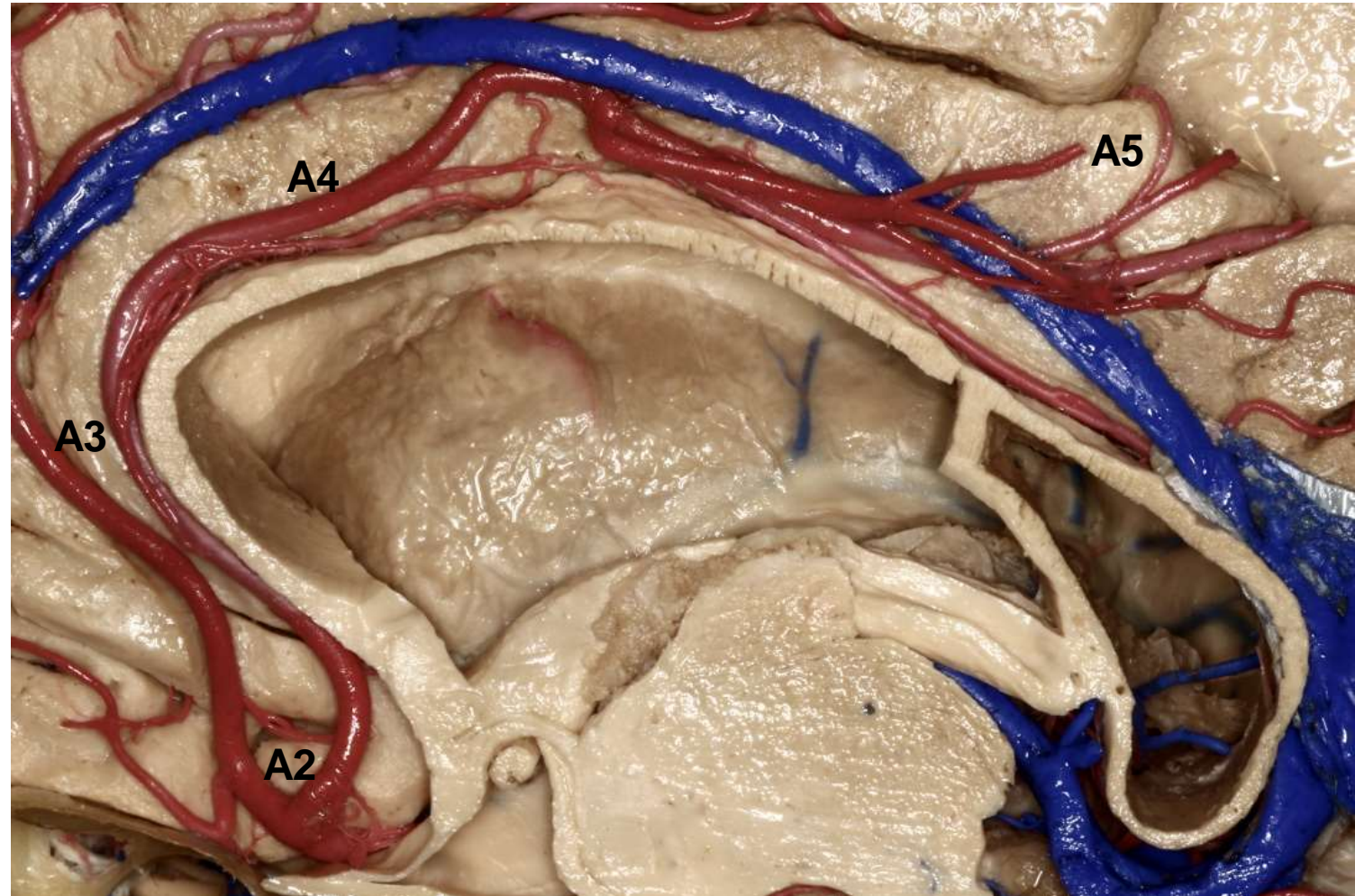
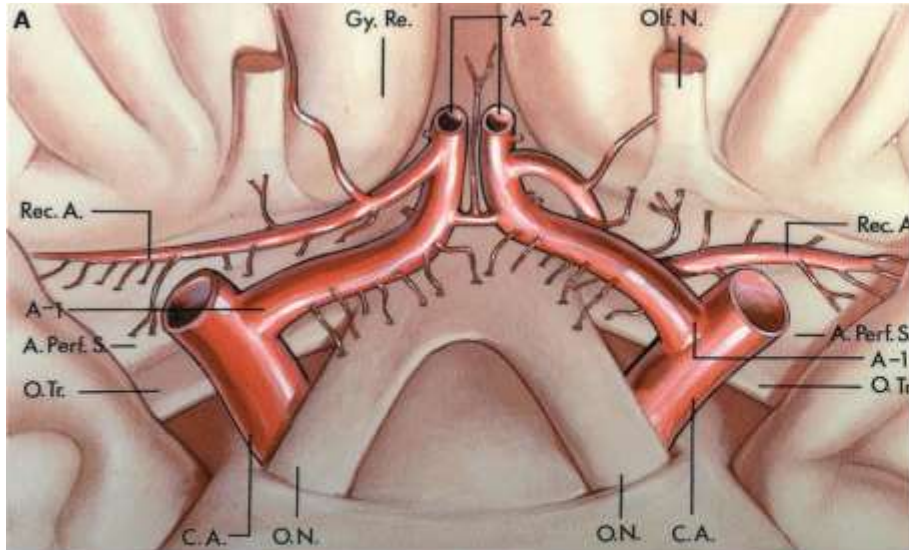
A1 segment proximálně od r. comm anterior

A2 segmentum infracallosum

A3 precallosum

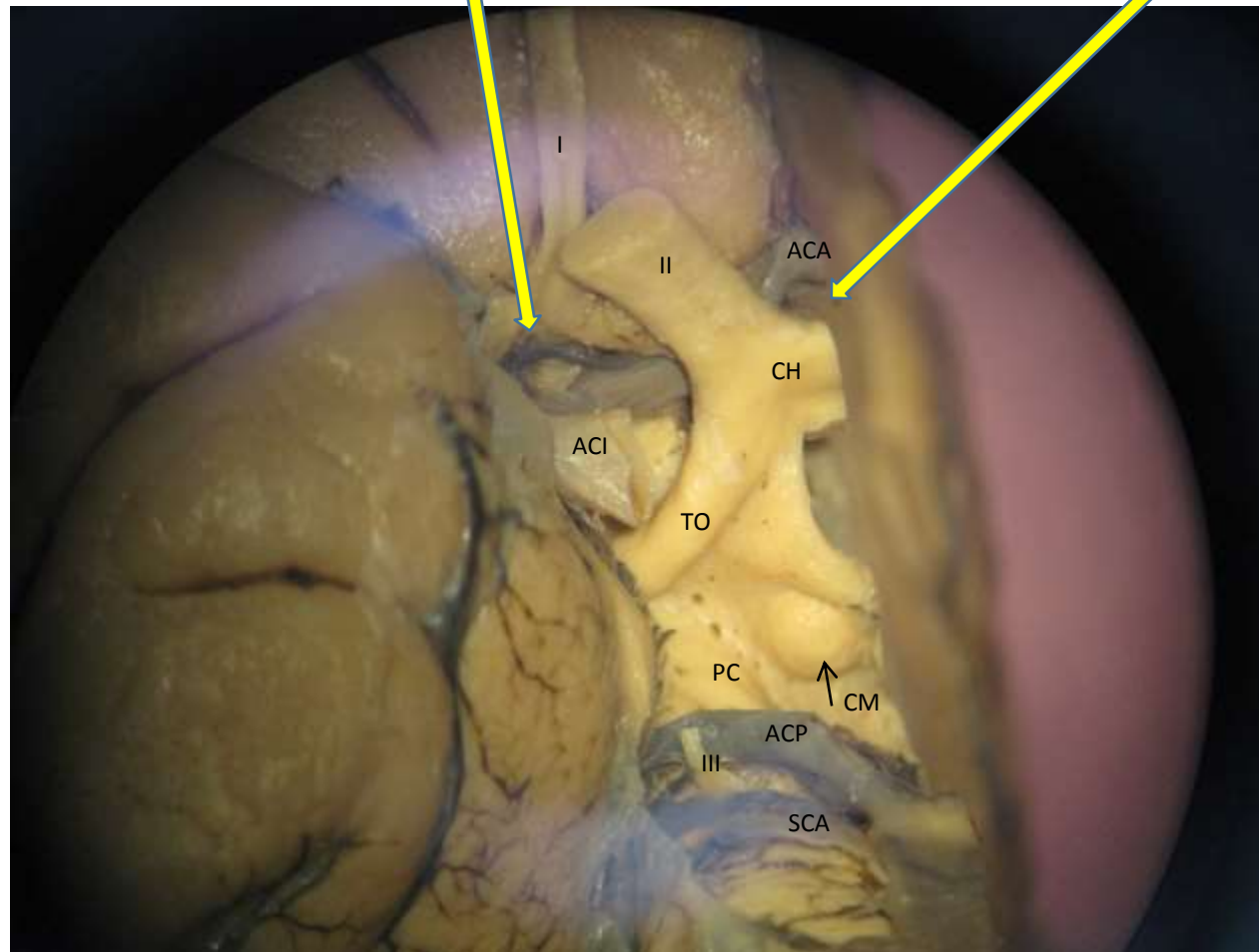
A4 supracallosum

A5 posterocallosum



Arteria recurrens Heubneri

Hypothalamické perforátory



A. cerebri anterior

A1 segment proximálně od r. comm anterior

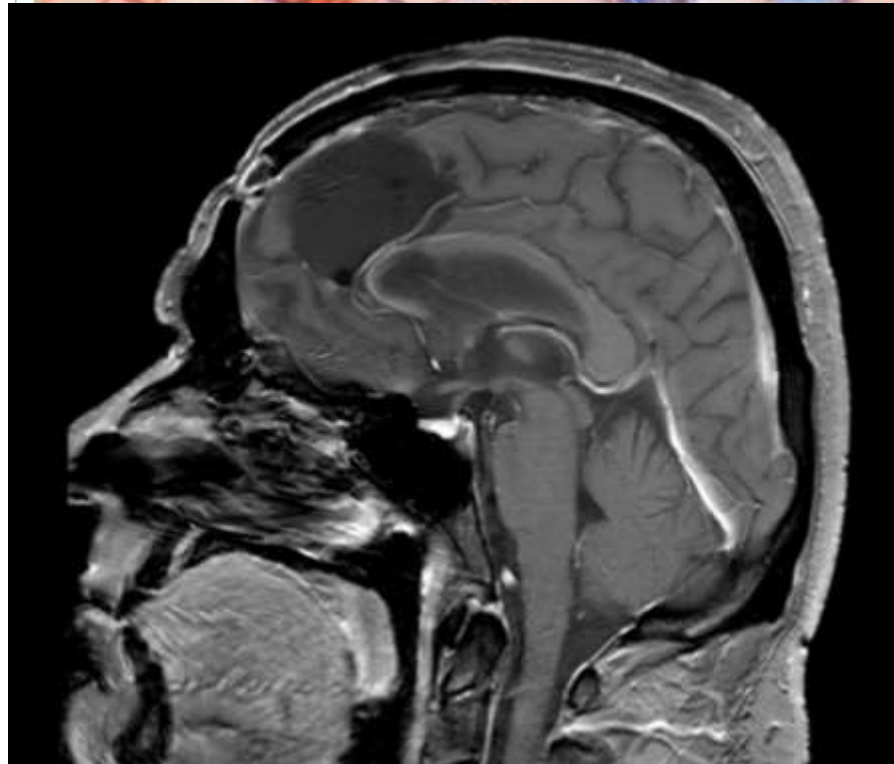
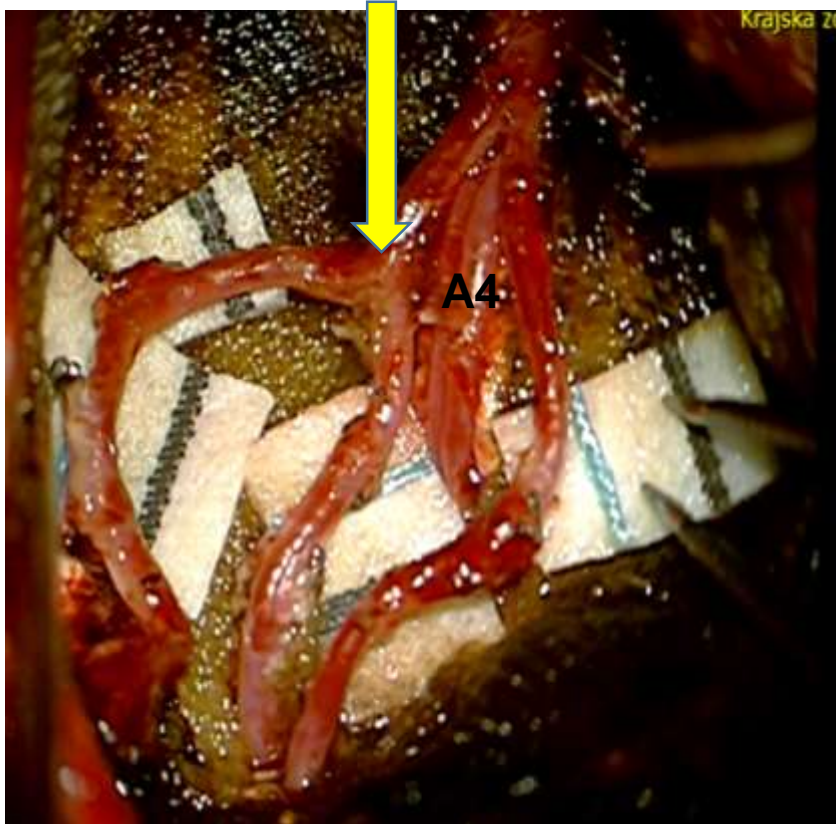
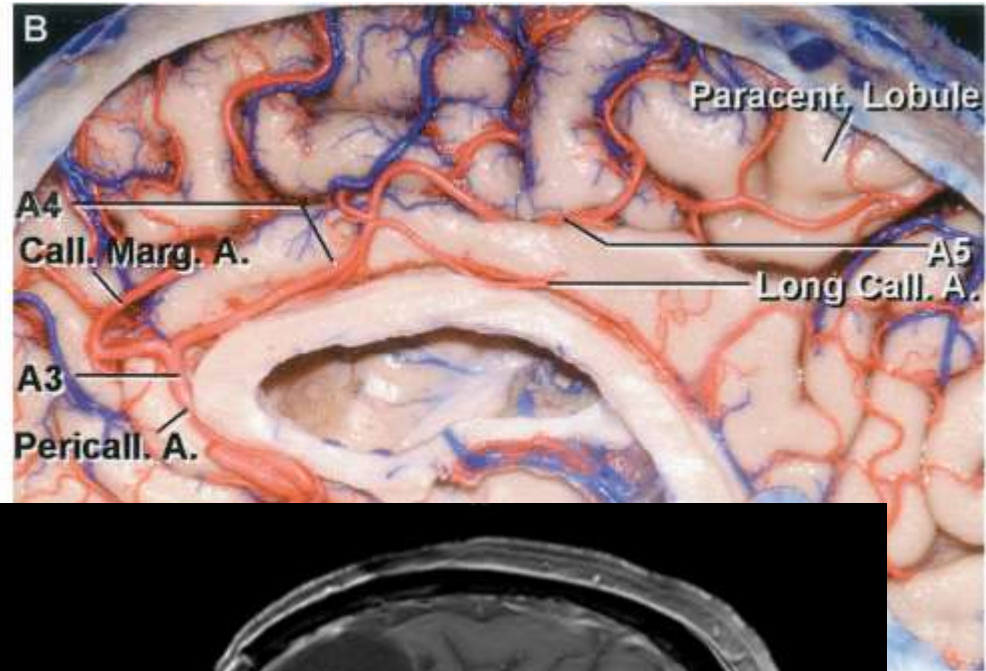
A2 segmentum infracallosum

A3 precallosum

A4 supracallosum

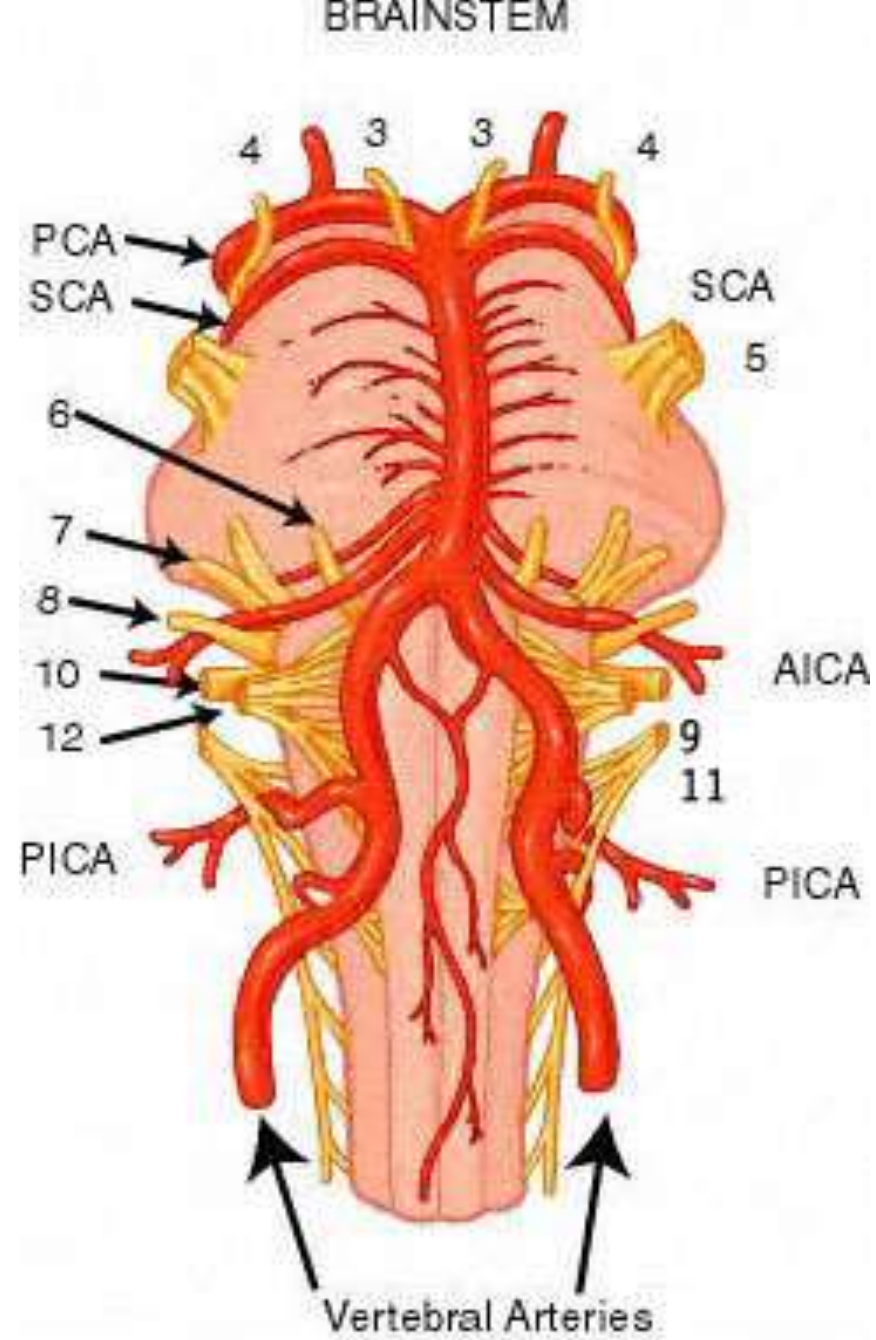
A5 posterocallosum

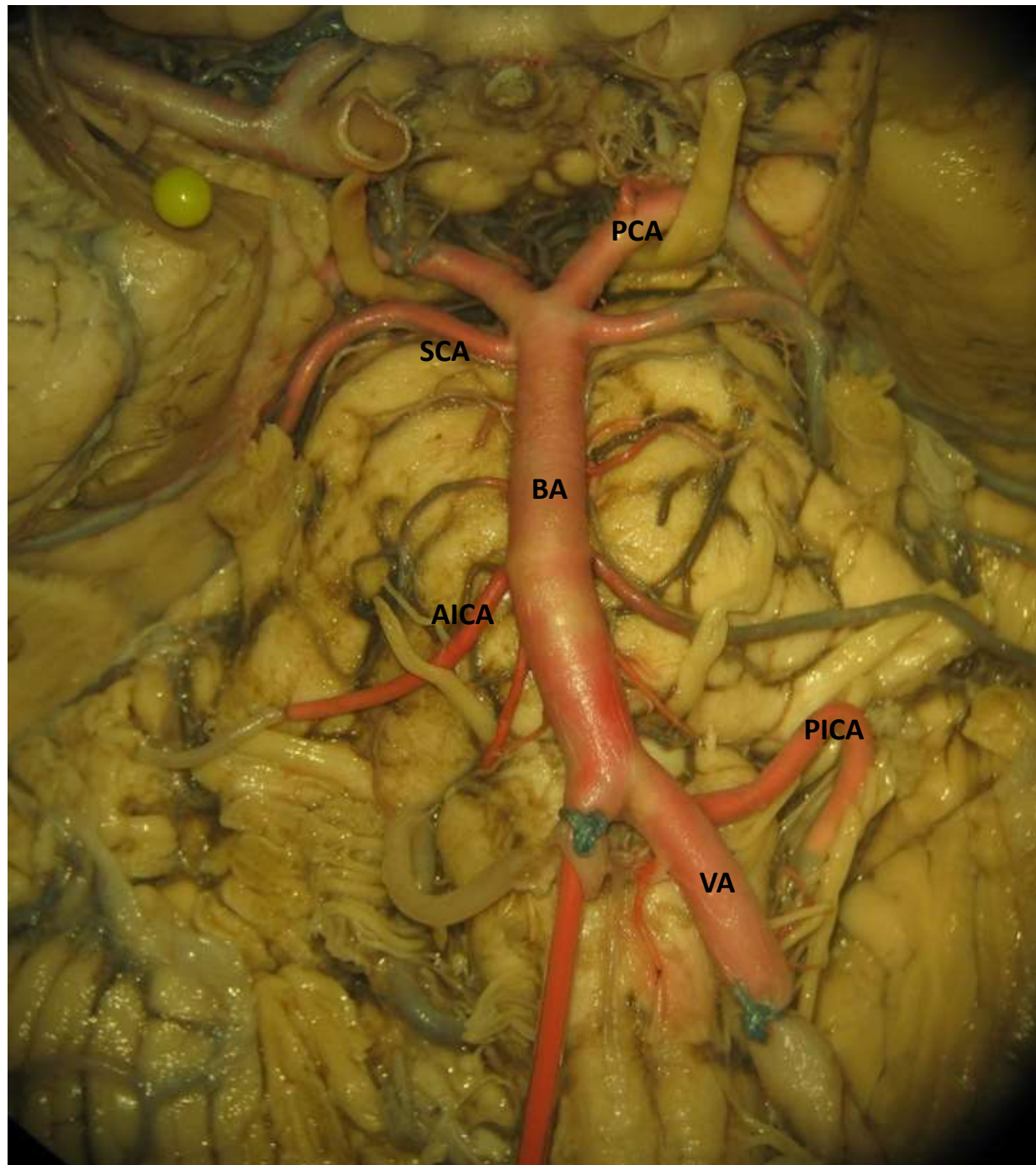
+ a. calloso-marginalis

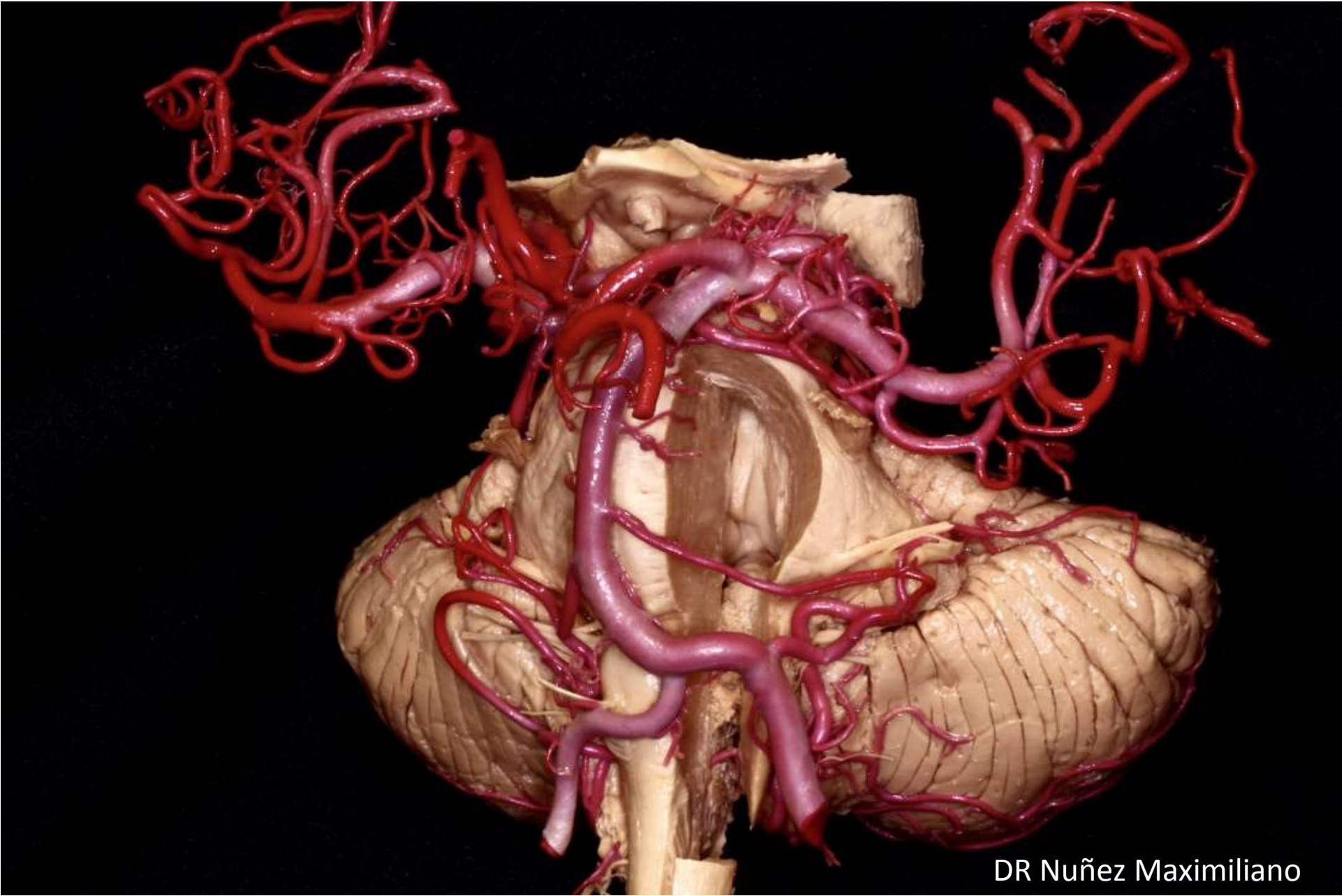


Vertebrobasilární povodí

Výstupy hlavových nervů a cévy na ventrální straně mozkového kmene







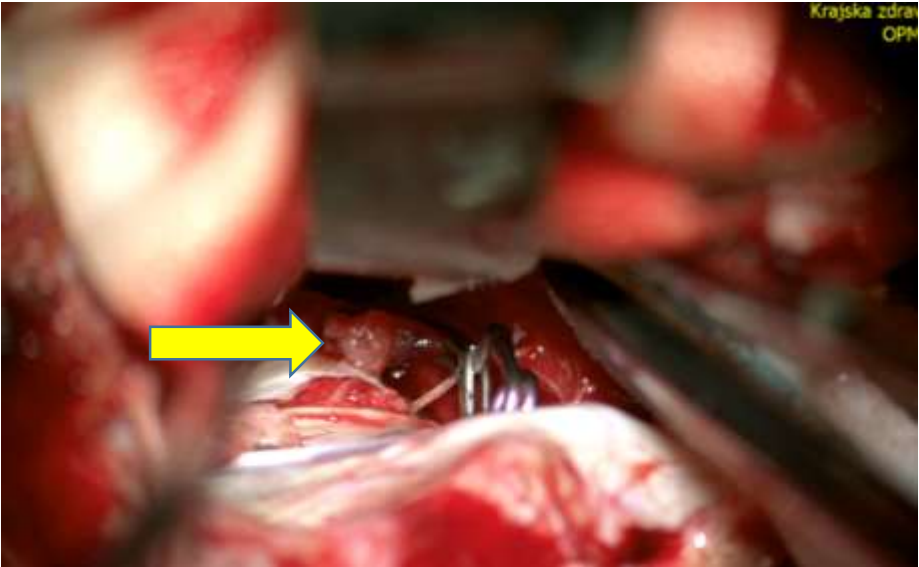
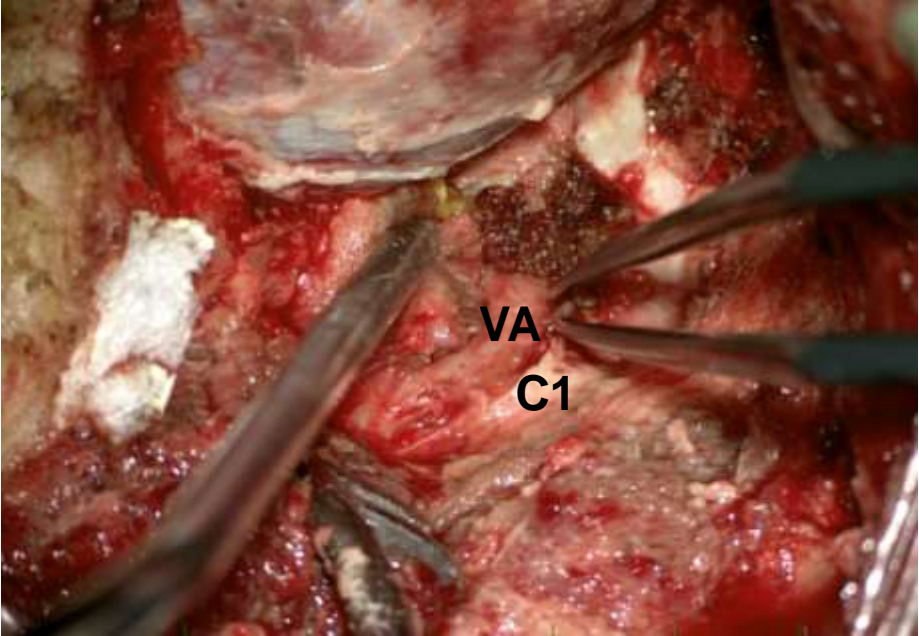
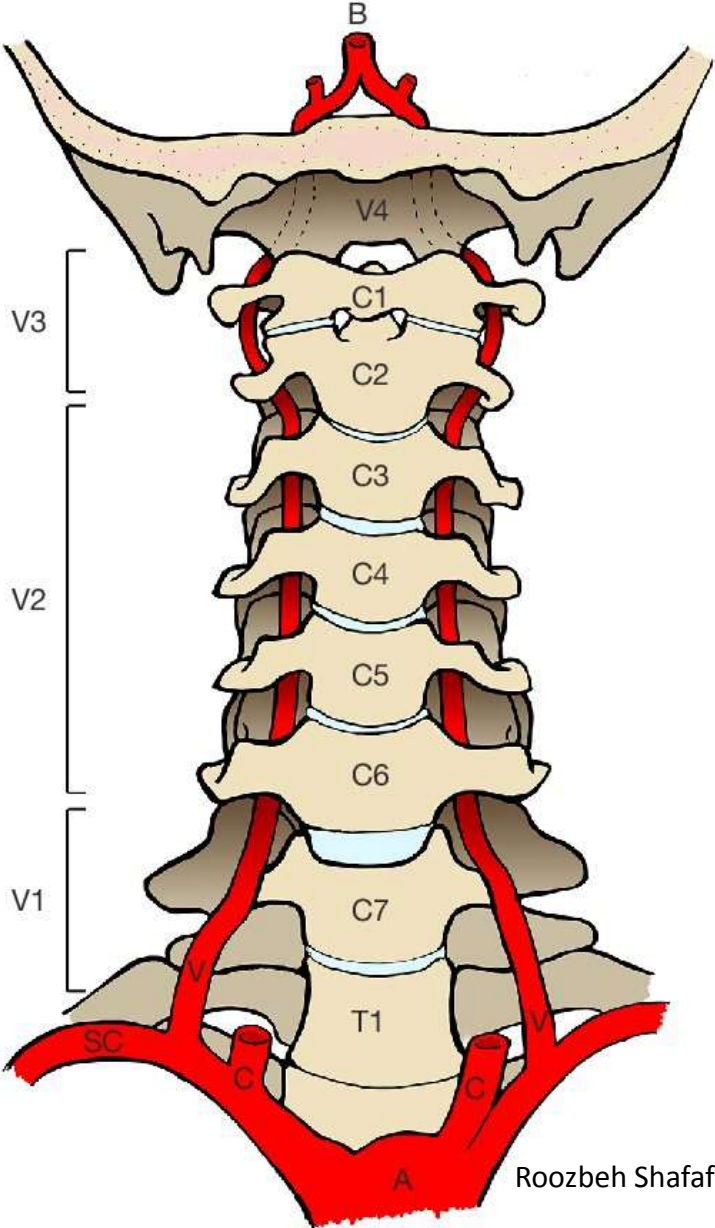
DR Nuñez Maximiliano

Retrosigmoidálně (cerebello-pontinní cisterna) a. labyrinthi (z AICA)



A. Vertebralis

- V1 –segmentum **prevertebrale**
- V2- **cervicale**
- V3- **atlanticum**
- V4- **intracraniale**



A. Cerebri posterior

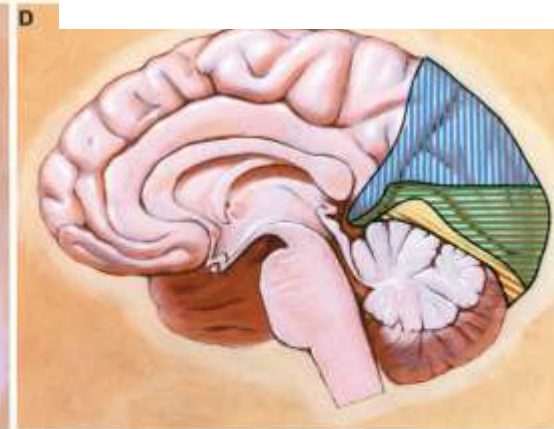
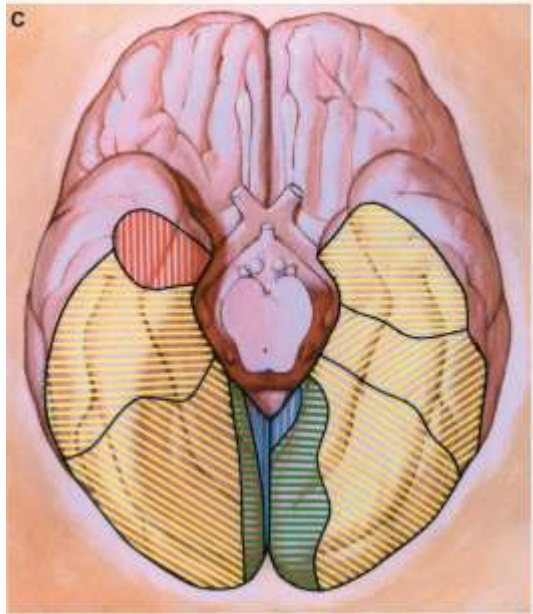


A. hippocampalis

A. temporales

A. calcarina

A. parietooccipitalis



Uzávěr – výpadek zraku kontralaterálních polovin zorného pole, parvo cesta zrakové kortikální projekce

A.CEREBRI POSTERIOR

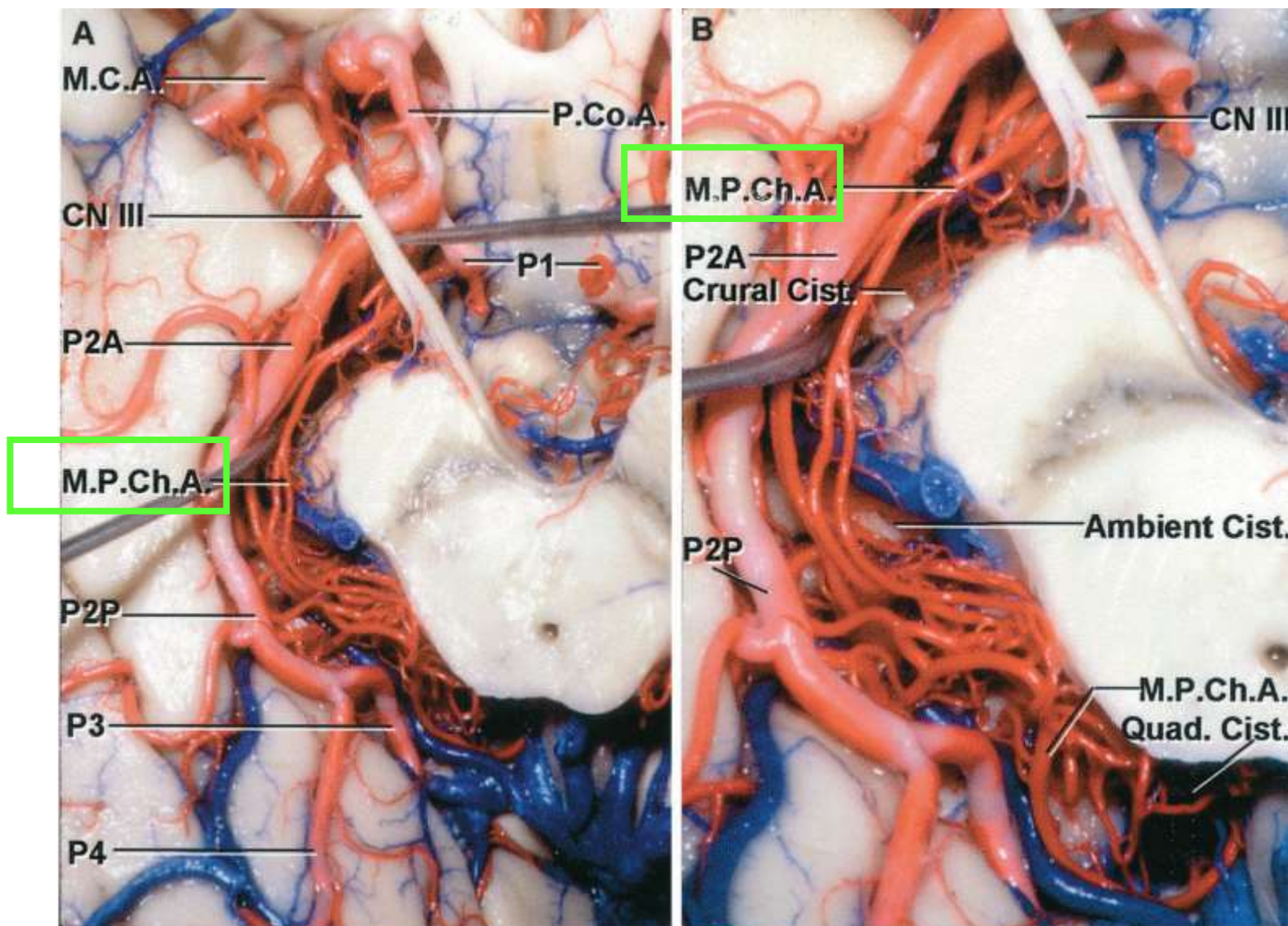
P1 prekomunikující segment

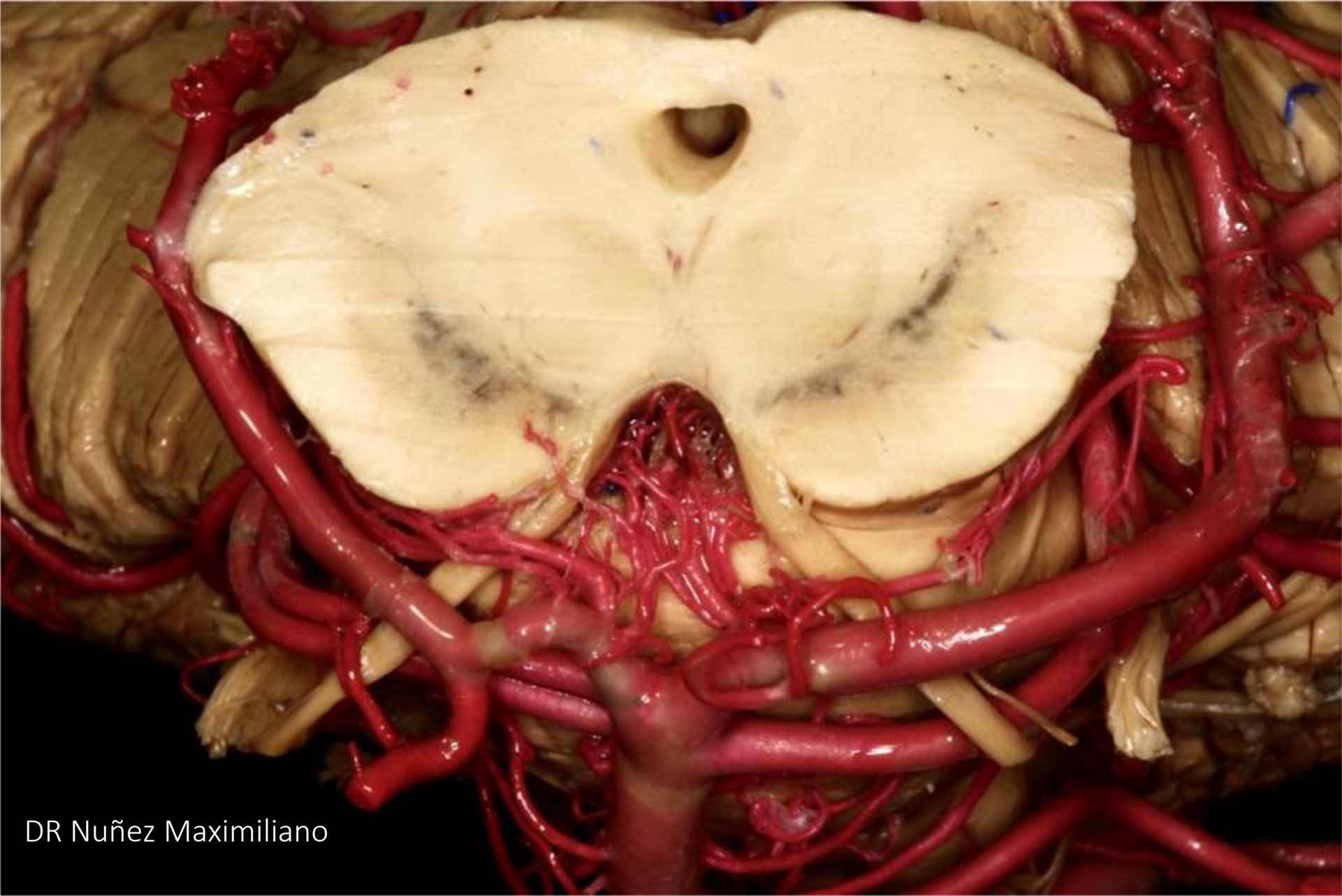
P2 Ant - crurální

Post - ambientní

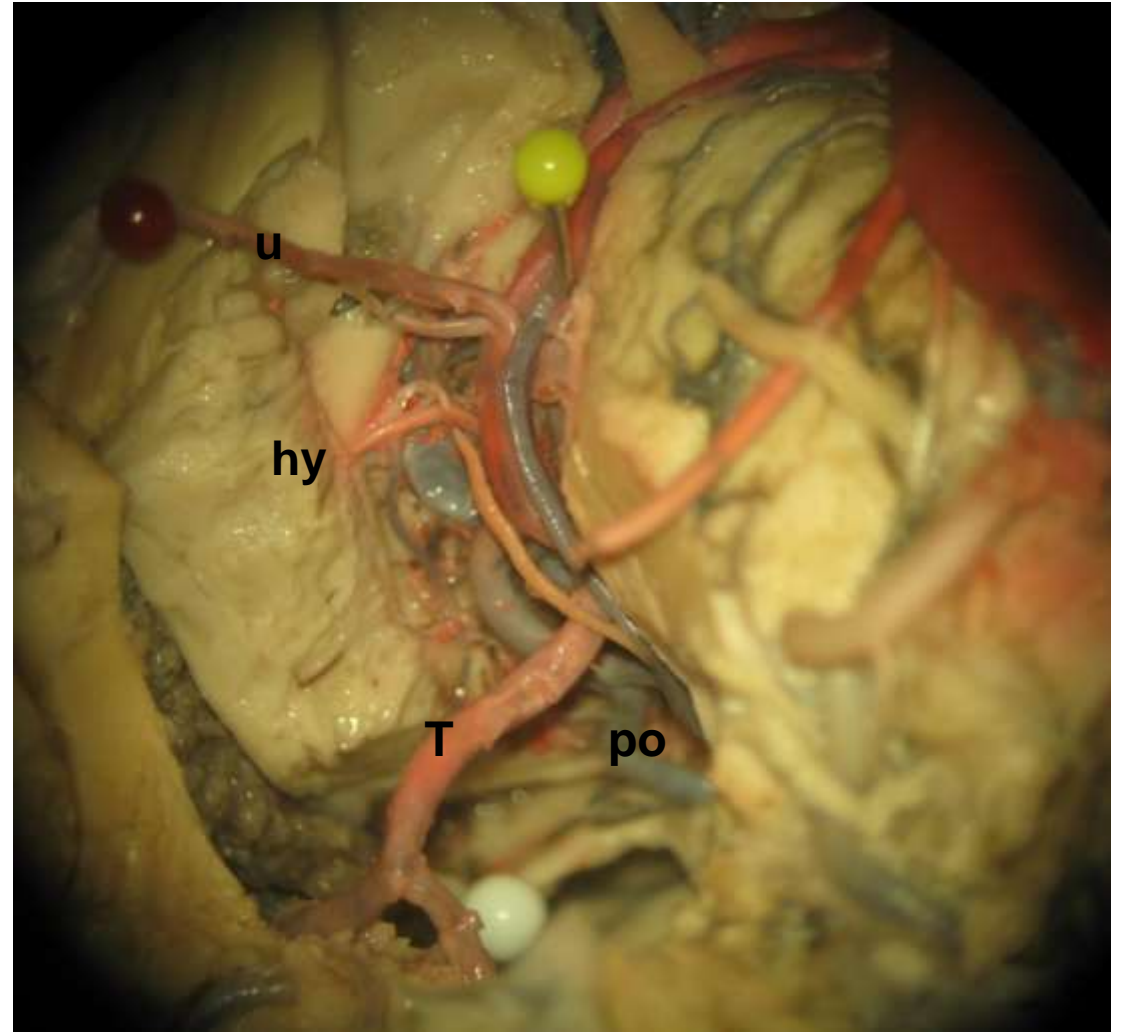
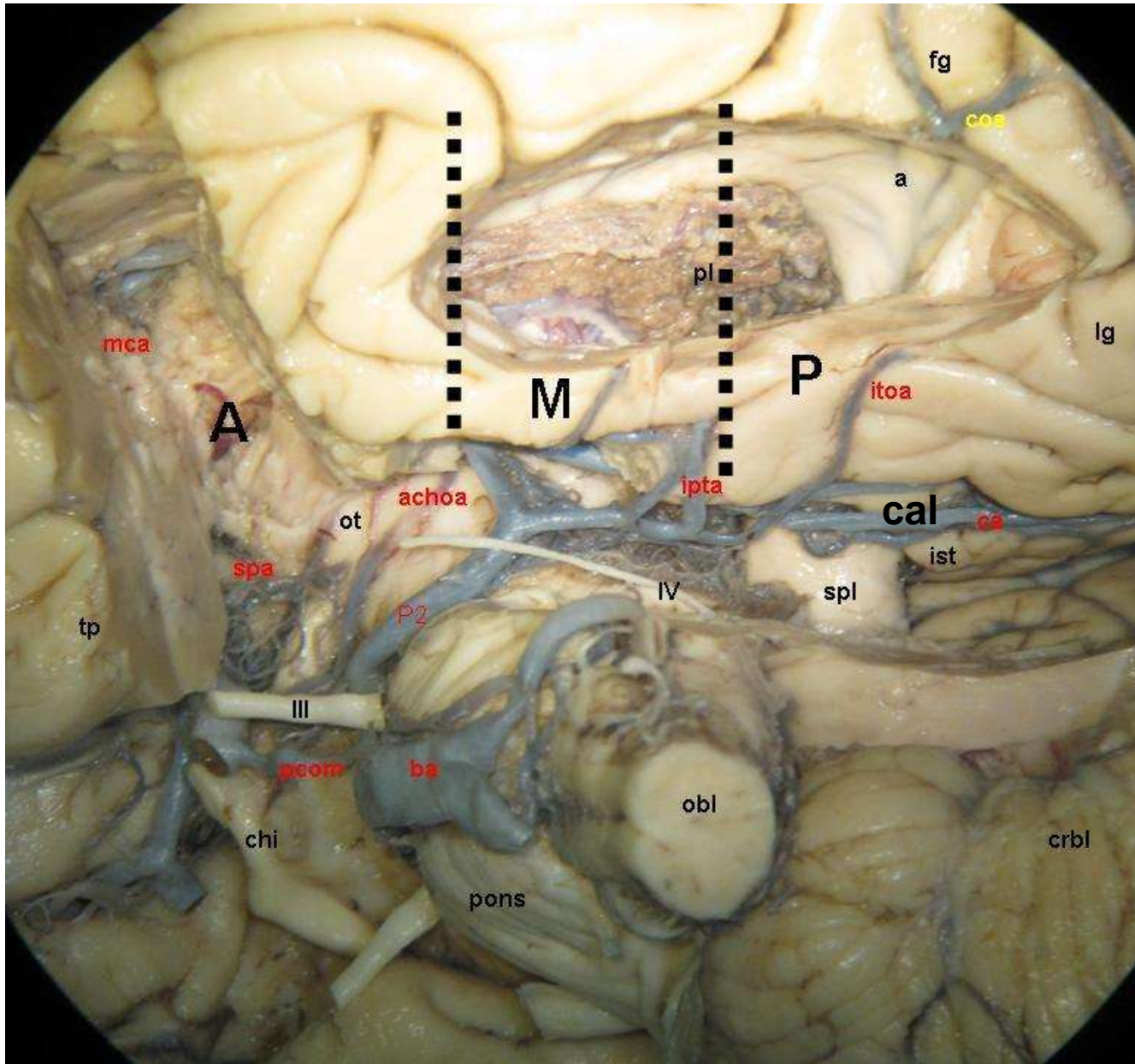
P3 quadrigeminální

P4 kortikální

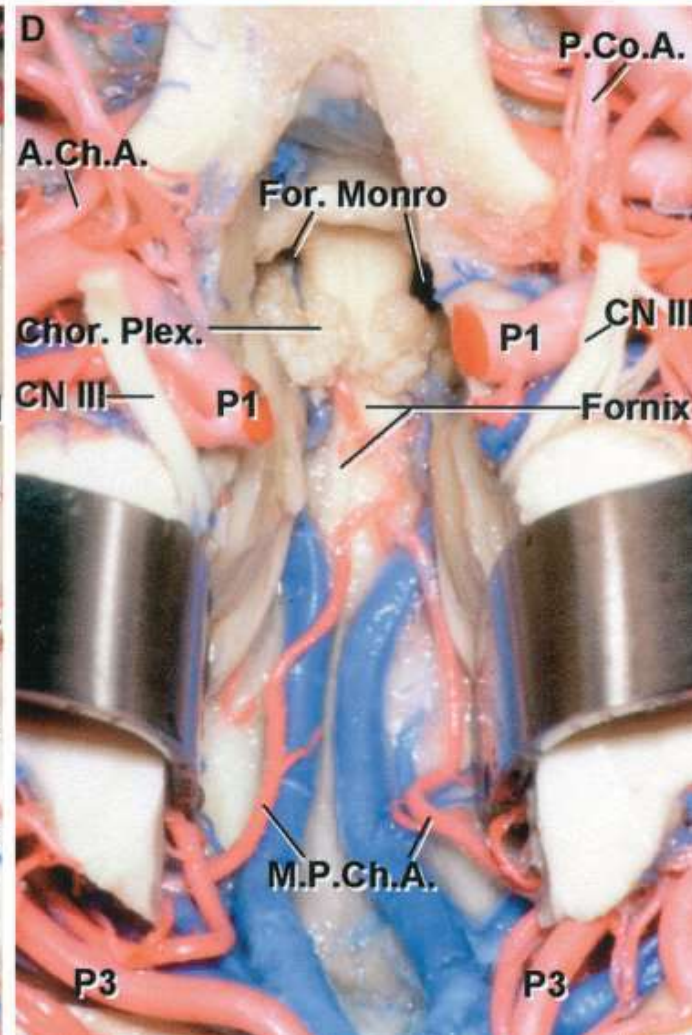
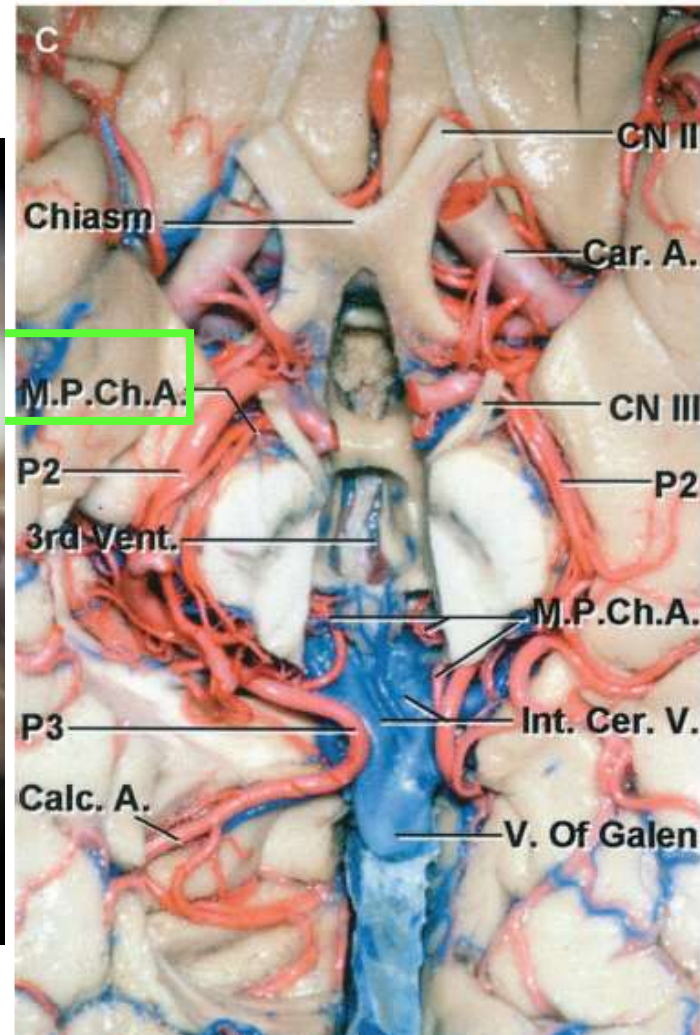
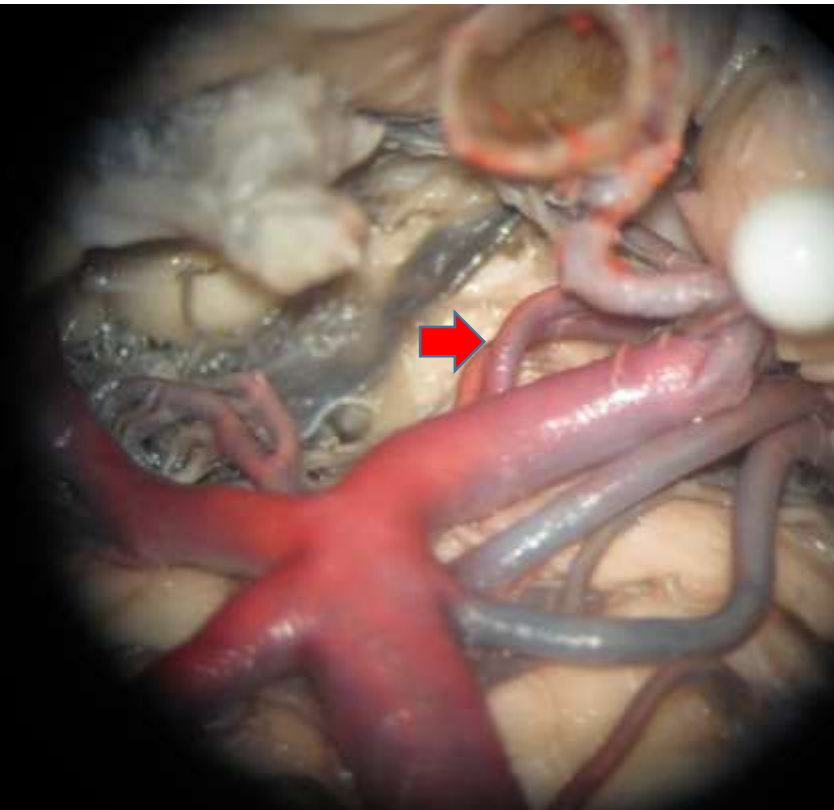




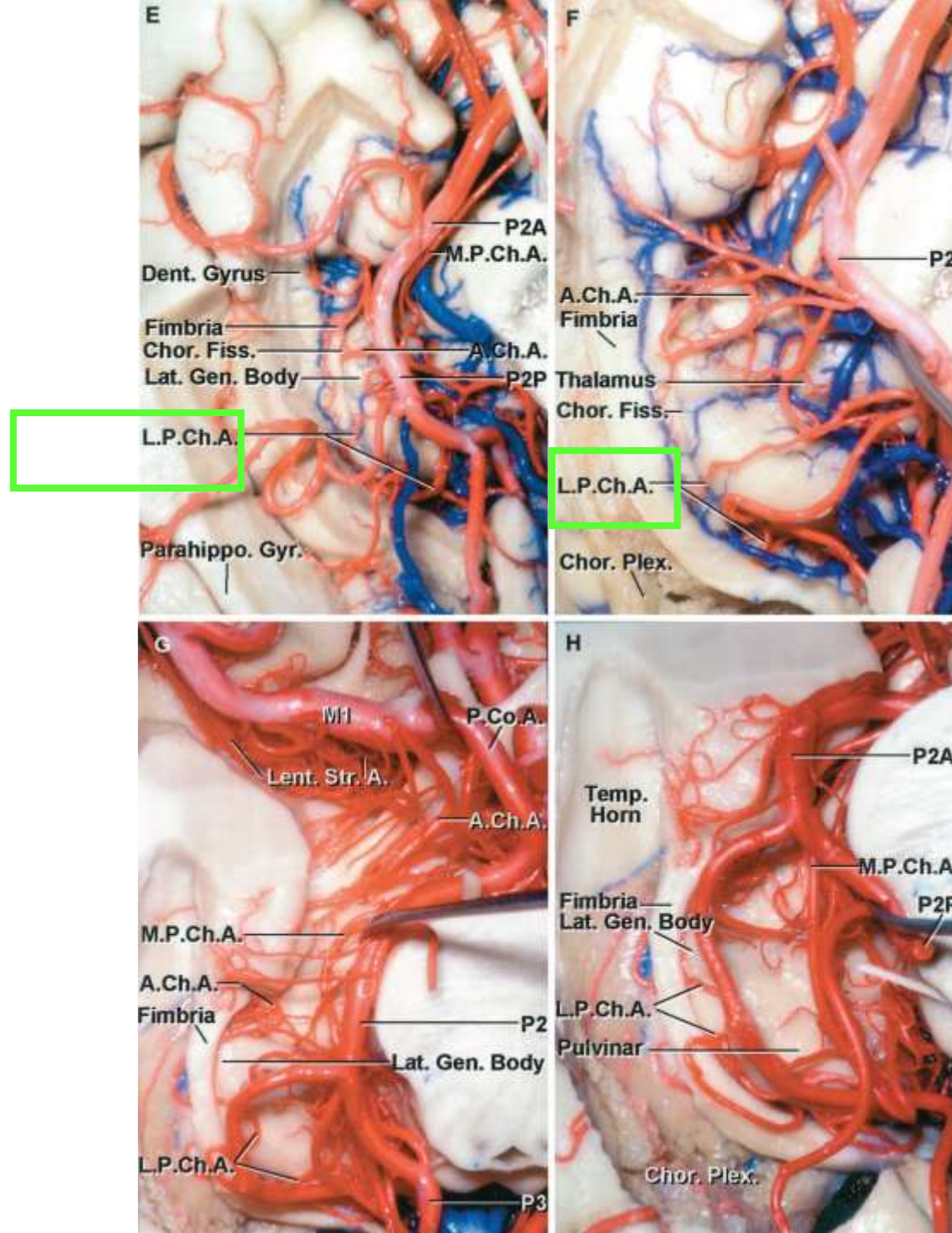
DR Nuñez Maximiliano



A. choroidea posterior medialis strop III.komory



A. choroidea posterior lateralis



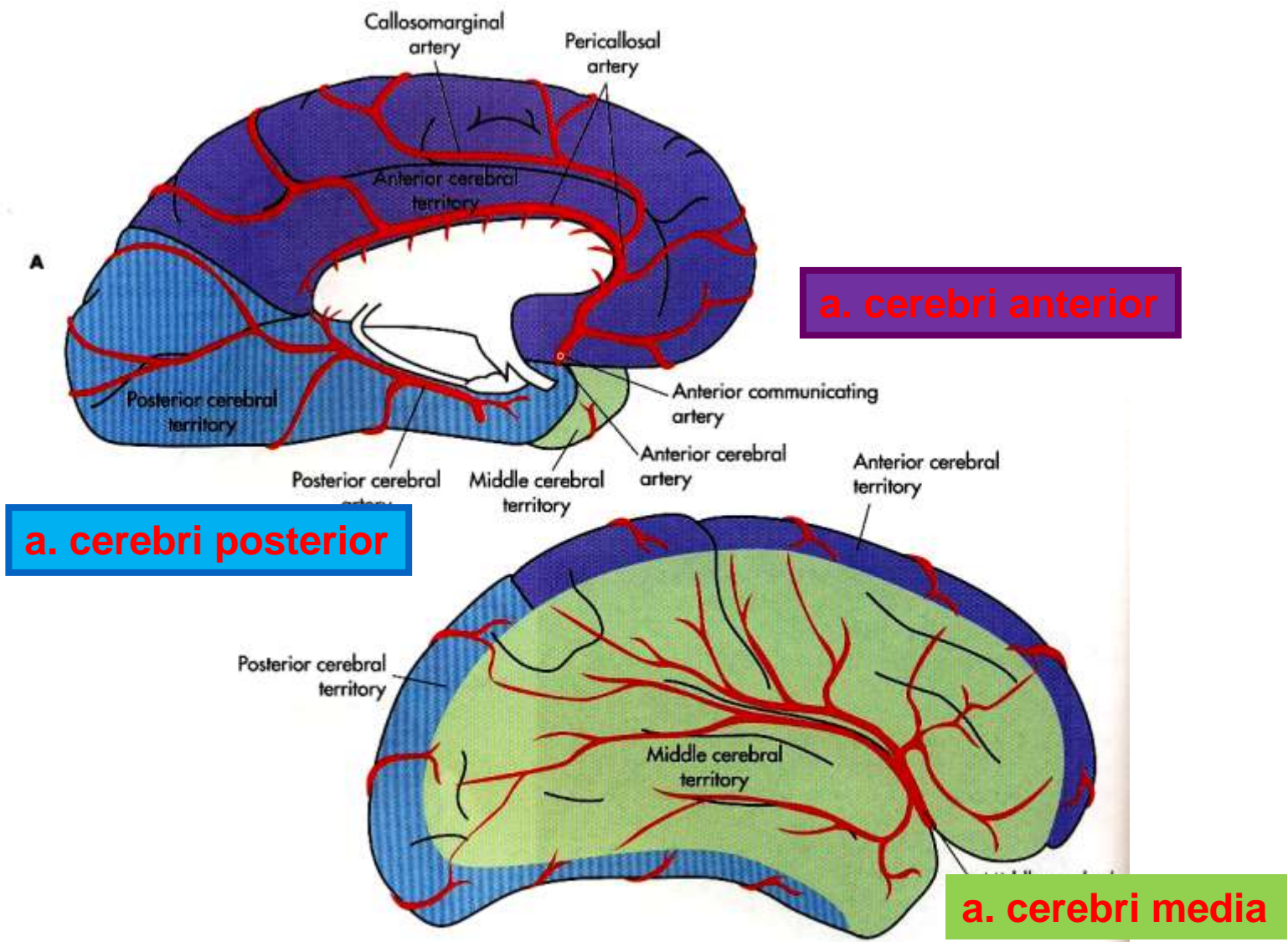


FIGURE 6-4 Arteries on the medial (A) and lateral (B) surfaces of the brain, with their areas of supply indicated. [Modified from Mettler FA: *Neuroanatomy*, ed 2, St. Louis, 1948, Mosby.]

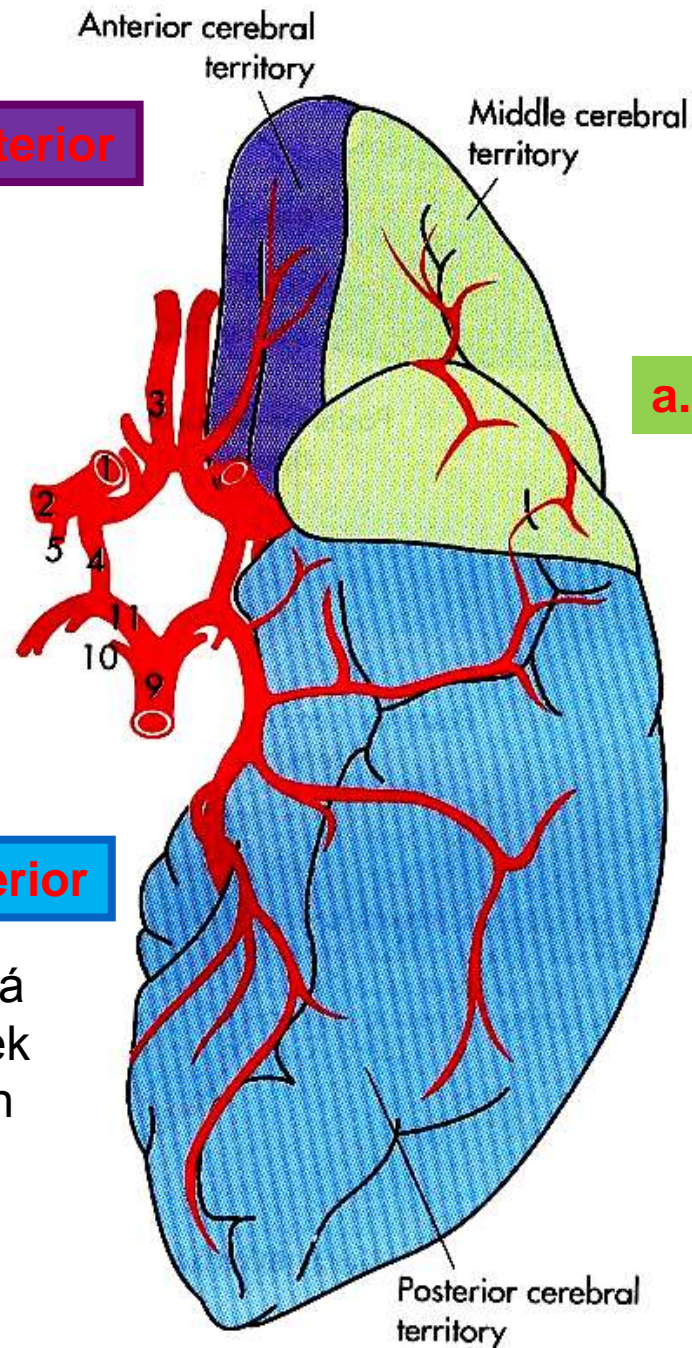
Povodí:

a. cerebri anterior

uzávěr –
hemiplegie
na opačné
DK

a. cerebri posterior

uzávěr – korová
slepota výpadek
druhostranných
zorných polí



a. cerebri media

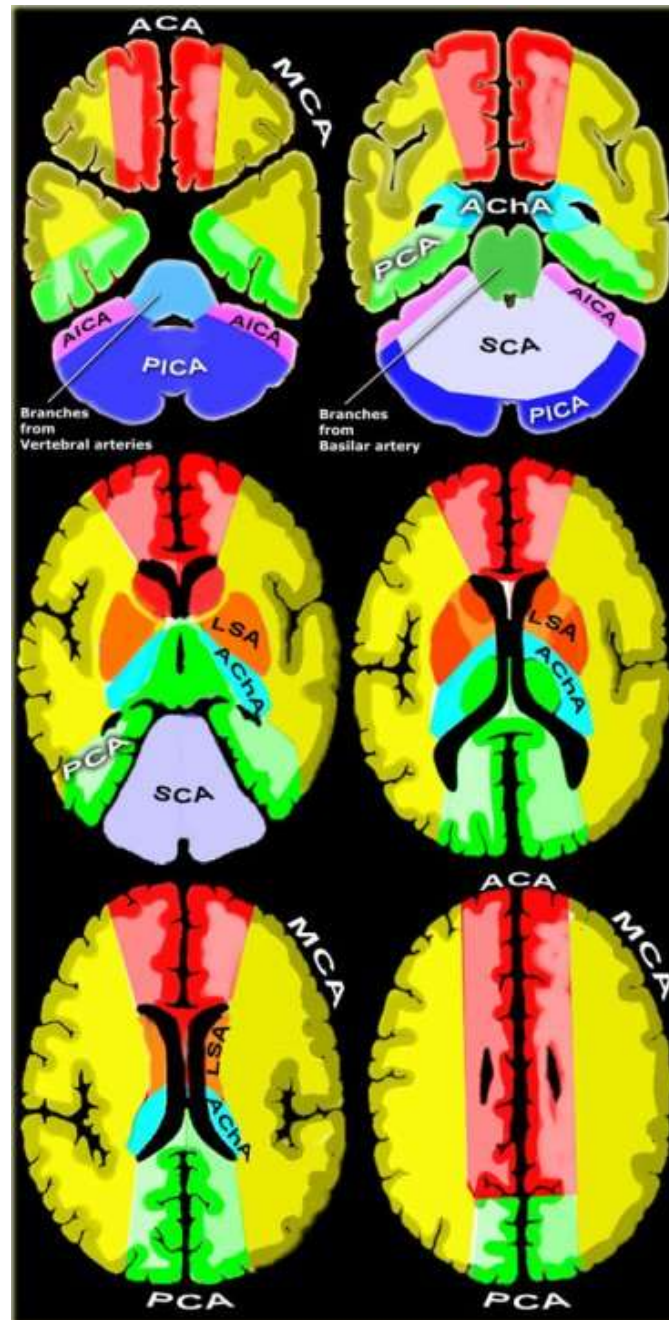
uzávěr –
hemiplegie na opačné HK,
obrta lícního nervu,
afázie (porucha řeči) při
poškození vlevo

Povodí jednotlivých tepen

a.cerebri anterior

a.cerebri media

a. cerebri posterior



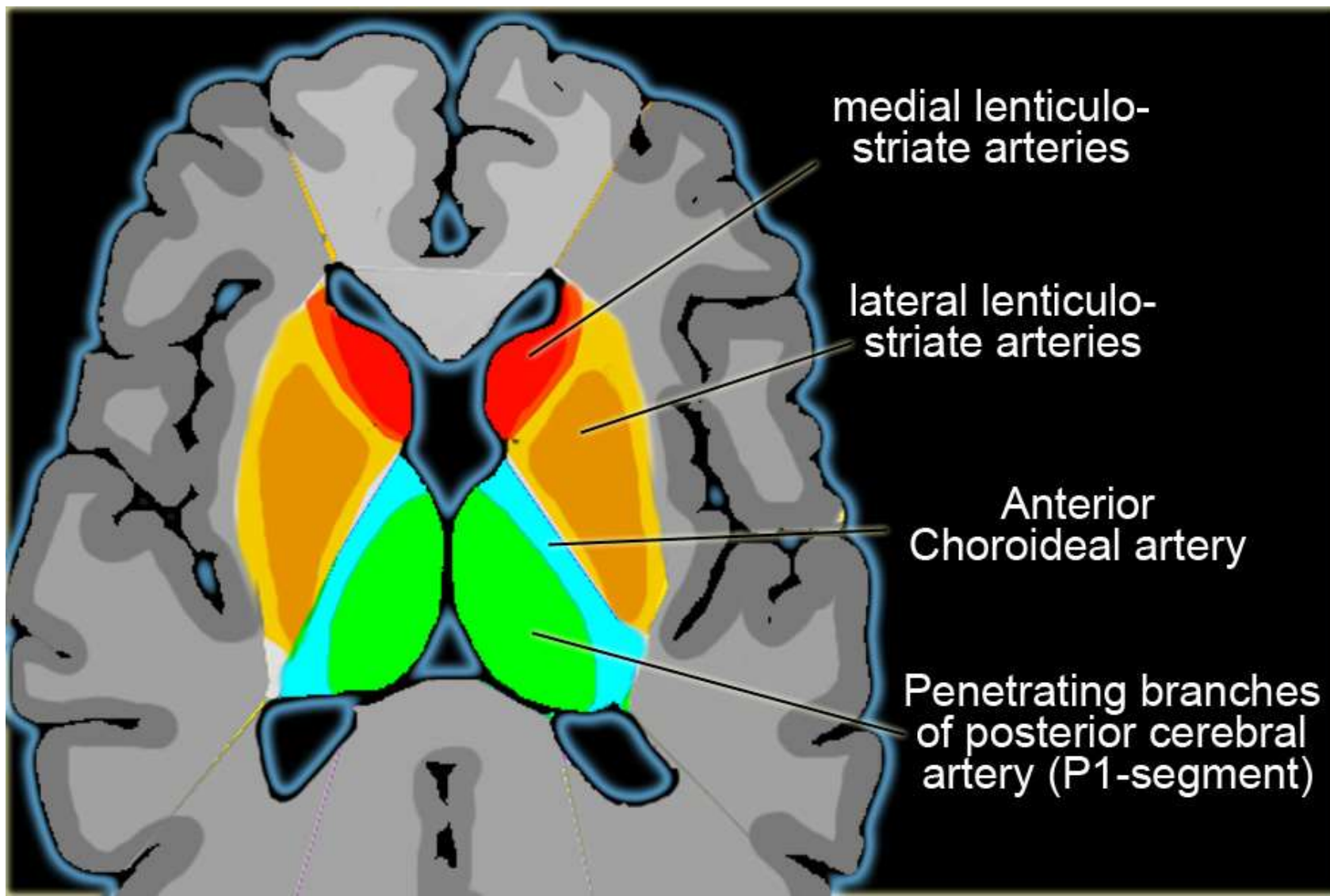
a.cerebellaris inferior anterior

a.cerebellaris inferior posterior

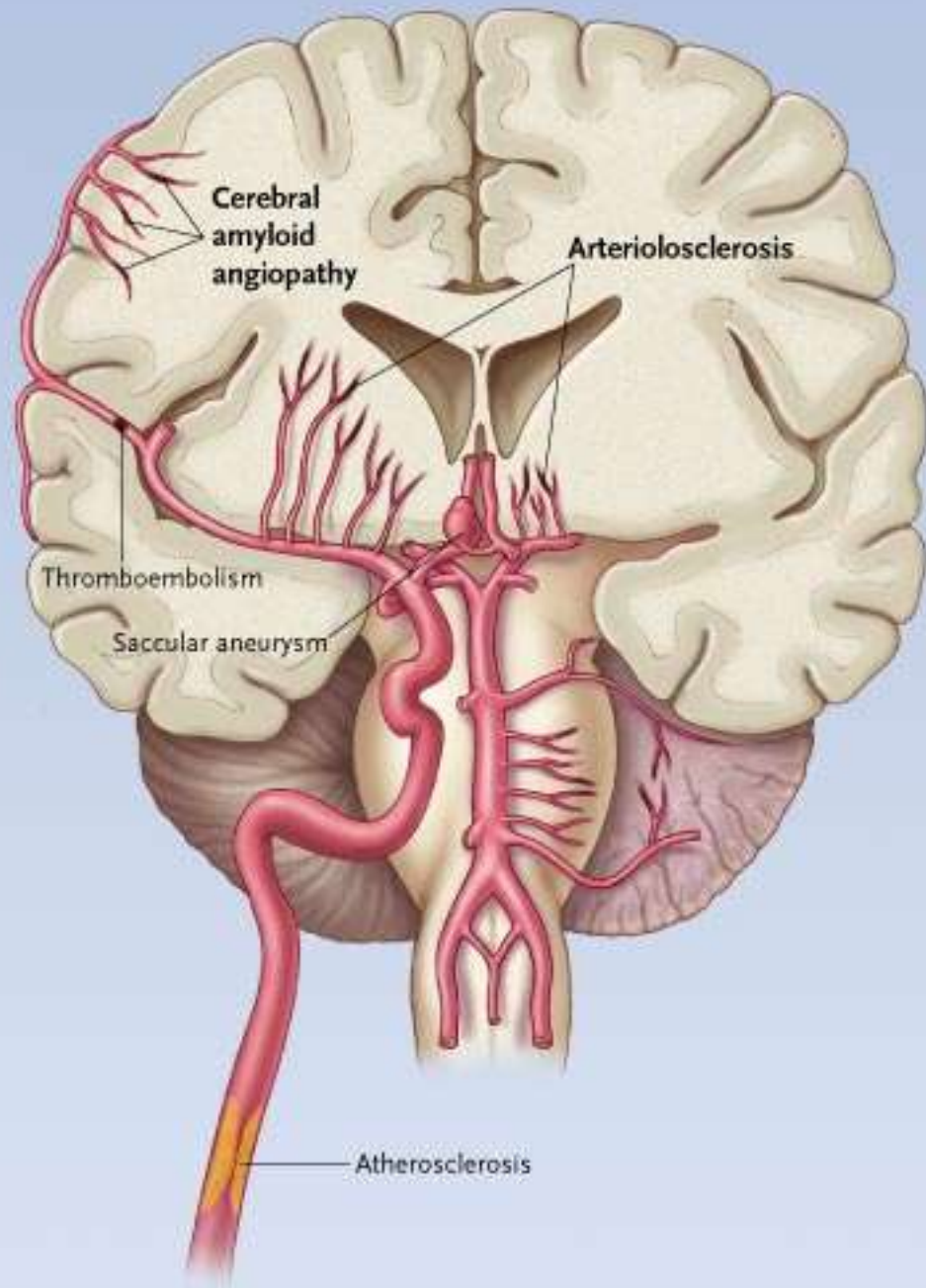
a.cerebellaris superior

a. choroidea anterior

Cévní zásobení basálních ganglií, thalamu a capsula interna



A



Nejčastější příčiny cévních poruch v mozku

aterosklerosa velkých tepen

arteriolosklerosa

aneurysma

uzávěr malých korových tepének

embolizace (např. při fibrilaci síní)

Intracerebrální hematom (ICH)

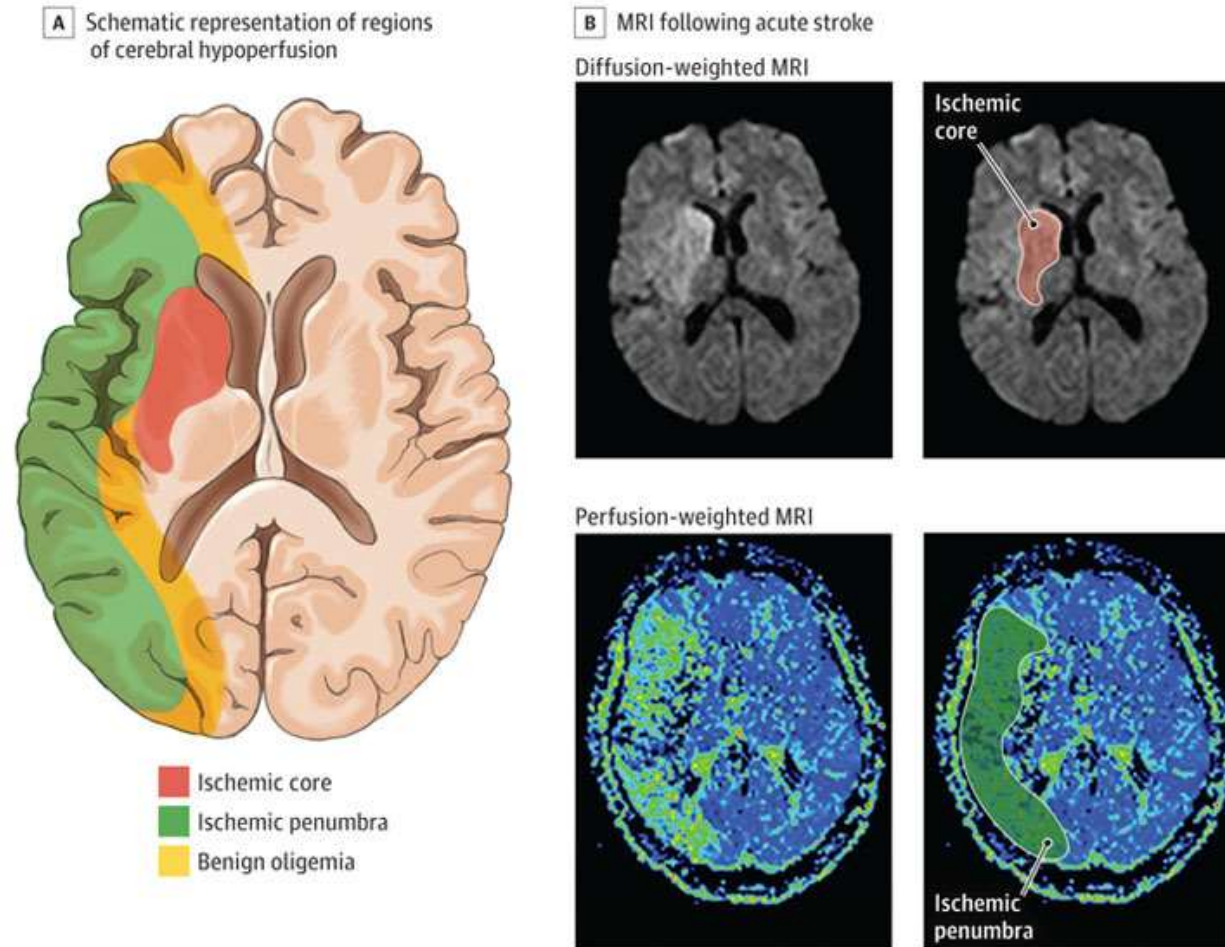
- typické krvácení hypertoniků (Charcot – Bechcetova arterie, putamen)
- BG 50% všech prim. spont. ICH



Hypoperfuze po akutní mozkové ischemické příhodě v oblasti a. cerebri media

Norma perfúze kortexu 80ml/100g/min x bílá hmota 20ml/100g/min x **10ml/100g/min**

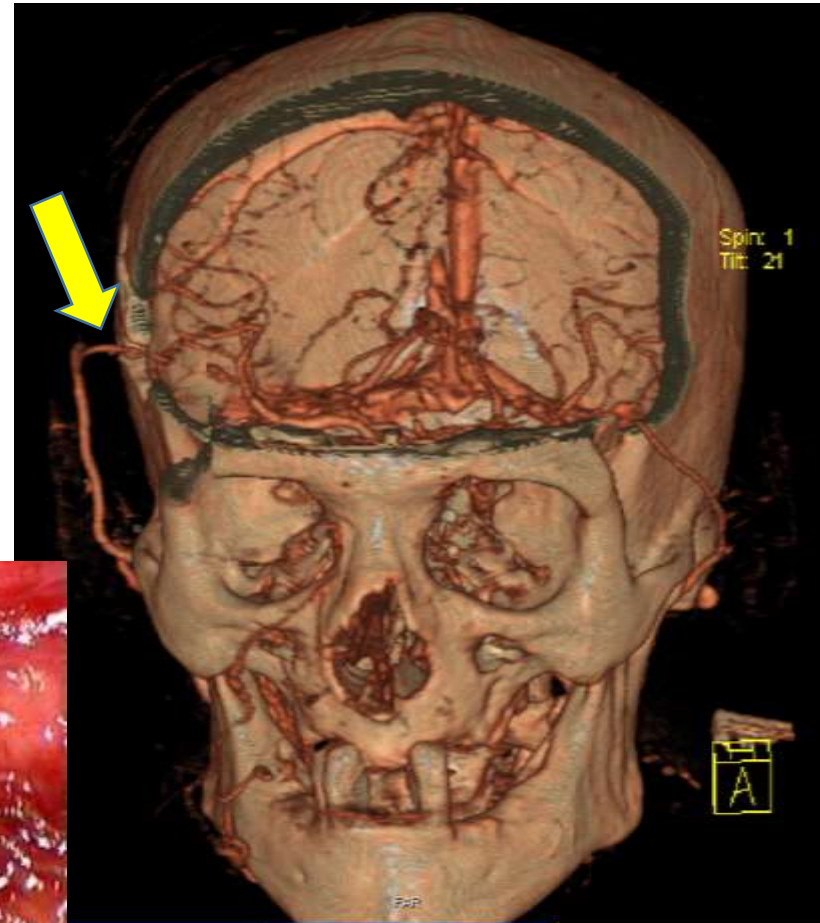
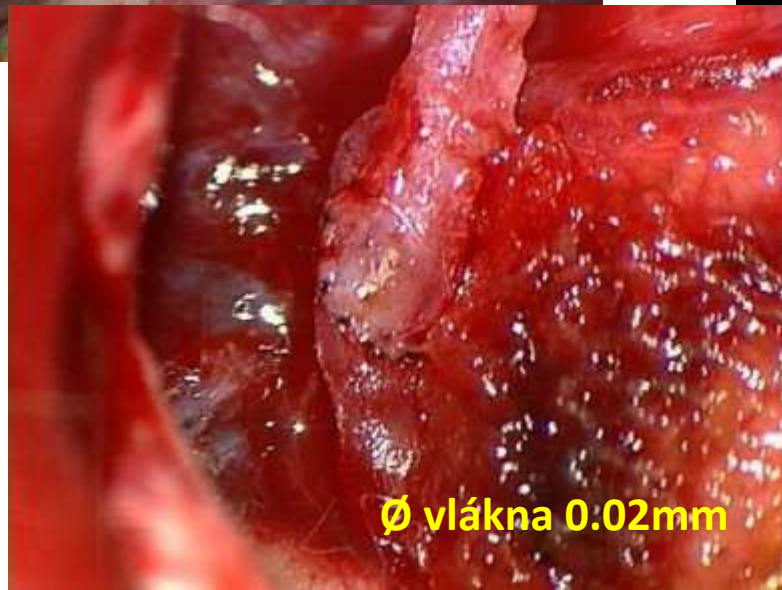
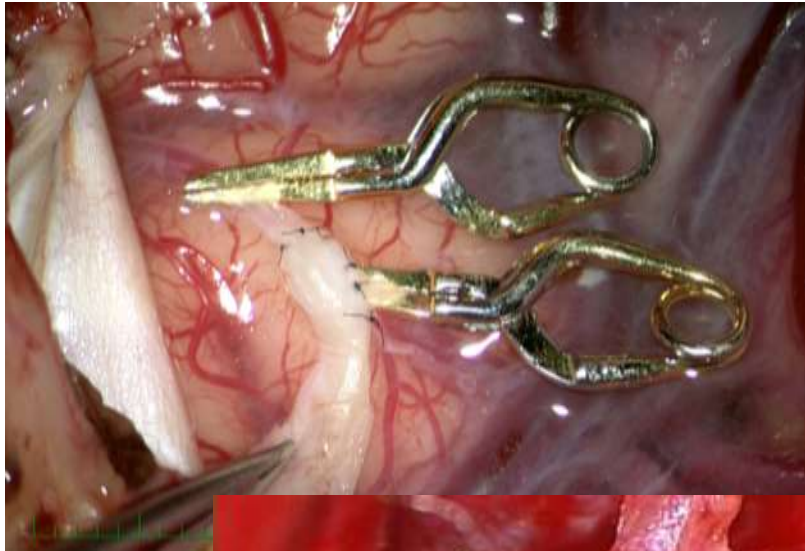
Mozek 20% perfúze lidského těla x 2% váhy



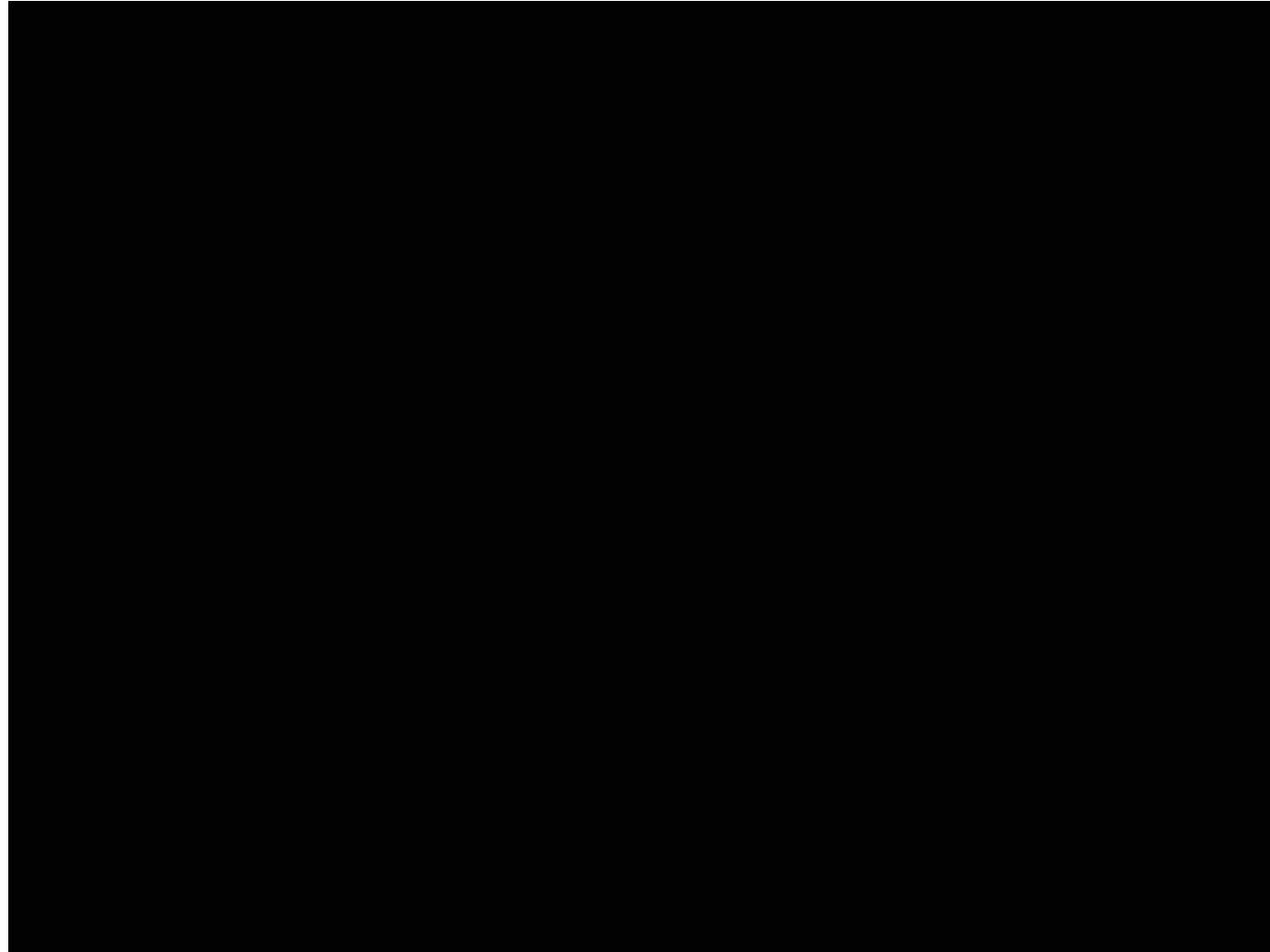
49-letý pacient s náhle vzniklou dysarthrií a levostrannou hemiparesou

Penumbra – oblast se sníženým průtokem krve, kterou lze včasným obnovením průtoku zachránit

ECIC bypass při okluzi ACI

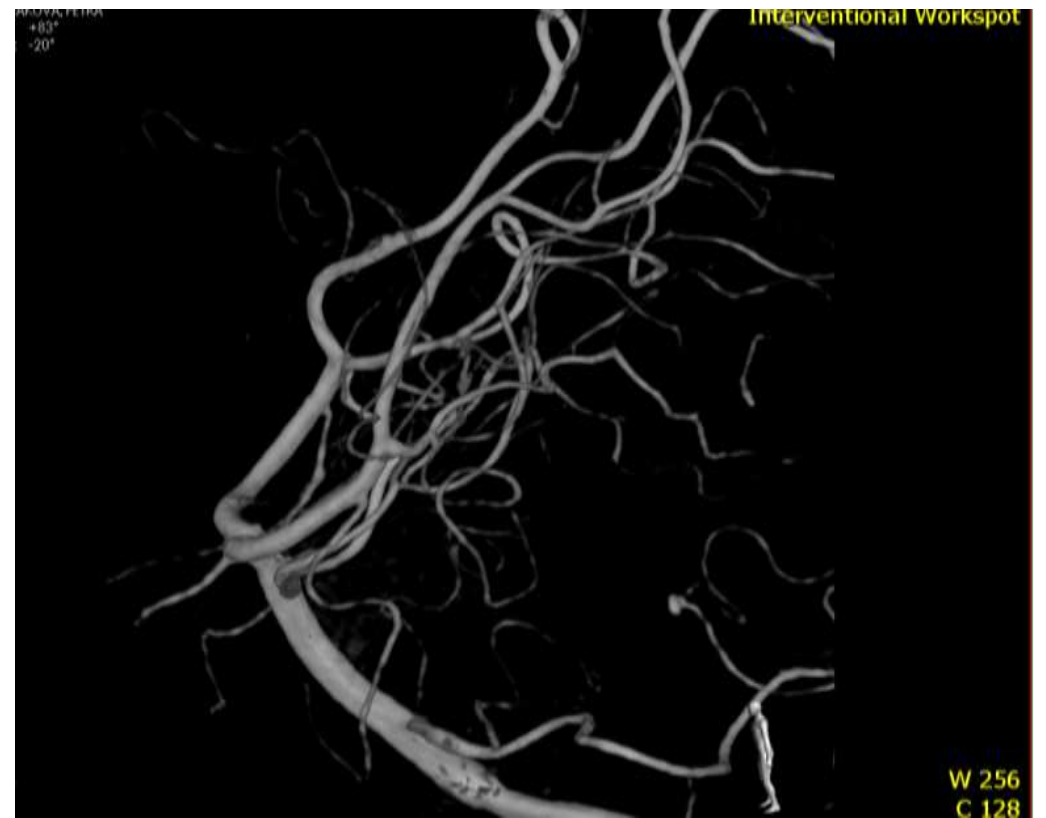


Klip aneurysmatu MCA

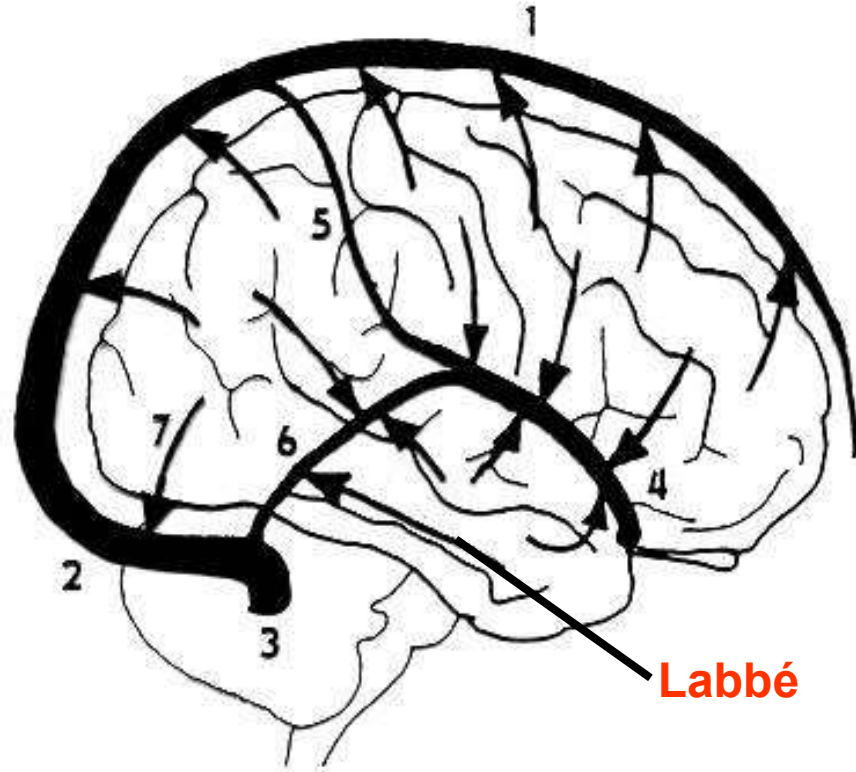


DSA





Povrchové mozkové žíly

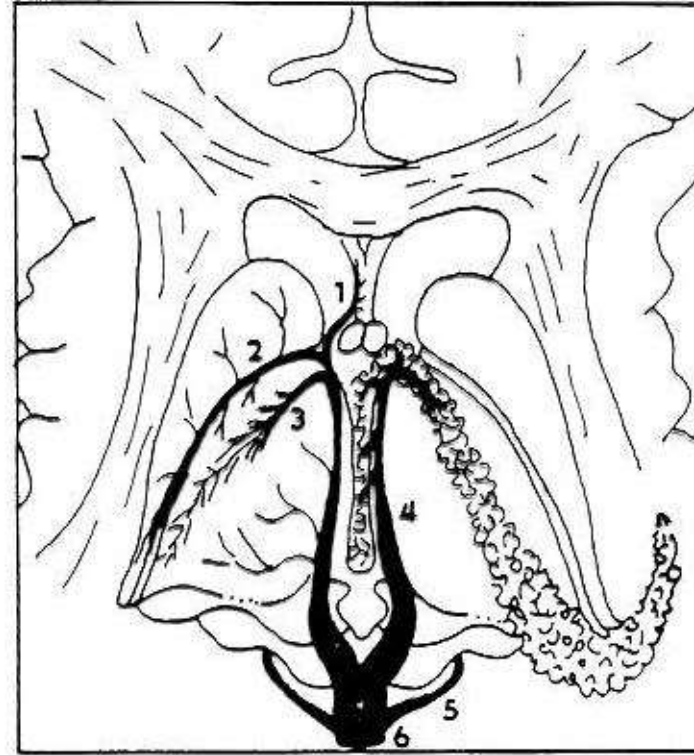


Labbé

Obr. 65.: Korové žíly na laterální straně hemisféry.

1 – sinus sagittalis superior s vtékajícími vv. cerebri superiores (šipky), 2 – sinus transversus, 3 – sinus sigmoideus 4 – v. cerebri media superficialis, 5 – v. anastomotica superior (Trolardova), 6 – v. anastomotica posterior (Labbéova) 7 – vv. cerebri inferiores.

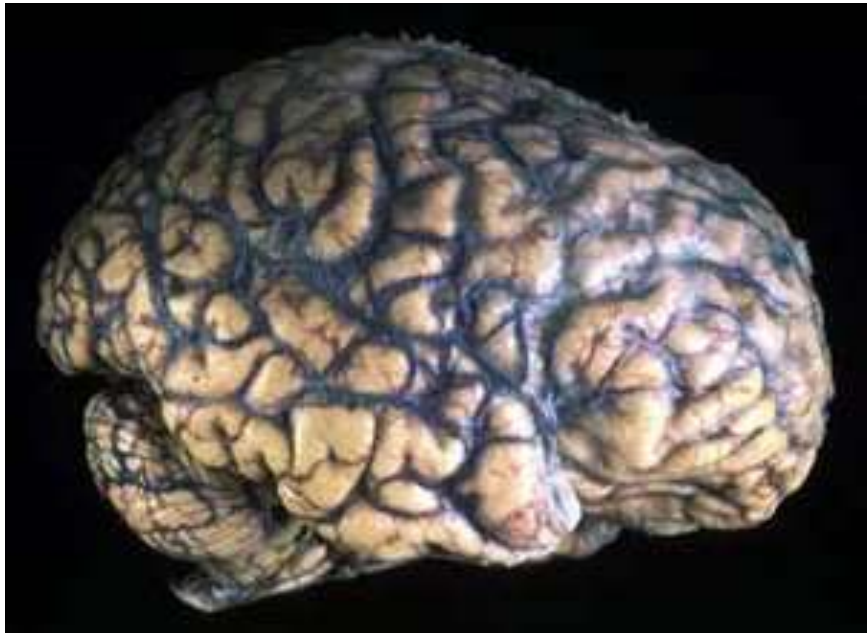
Hluboké mozkové žíly



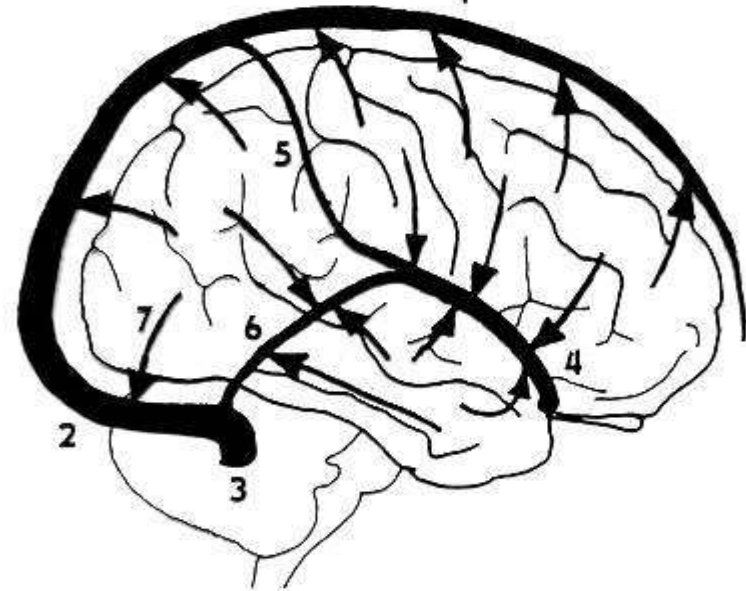
Obr. 66.: Hluboké mozkové žíly.

Jsou zakresleny do obrázku shodného s obr. 23, kde jsou také popsány jednotlivé struktury.

1 – v. septi pellucidi, 2 – v. thalamostriata, 3 – v. choroidea superior, 4 – v. cerebri interna, 5 – v. basalis (Rosenthal) 6 – v. magna cerebri (Galeni).



Povrchové mozkové žíly



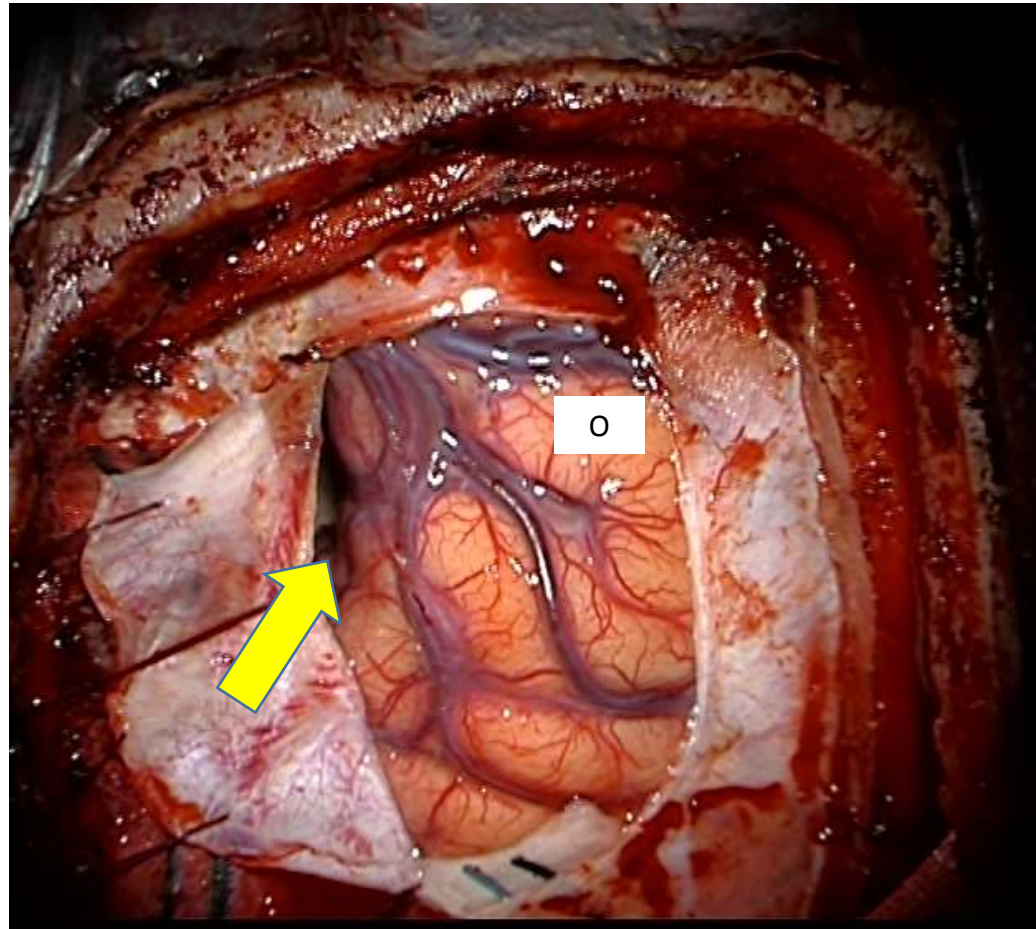
5 Vena anastomotica sup.
(Trolardova)

6 Vena anastomotica post.
(Labbéova) – do sinus
transversus

4- v. cerebri media superficialis
– do sinus sphenoparietalis

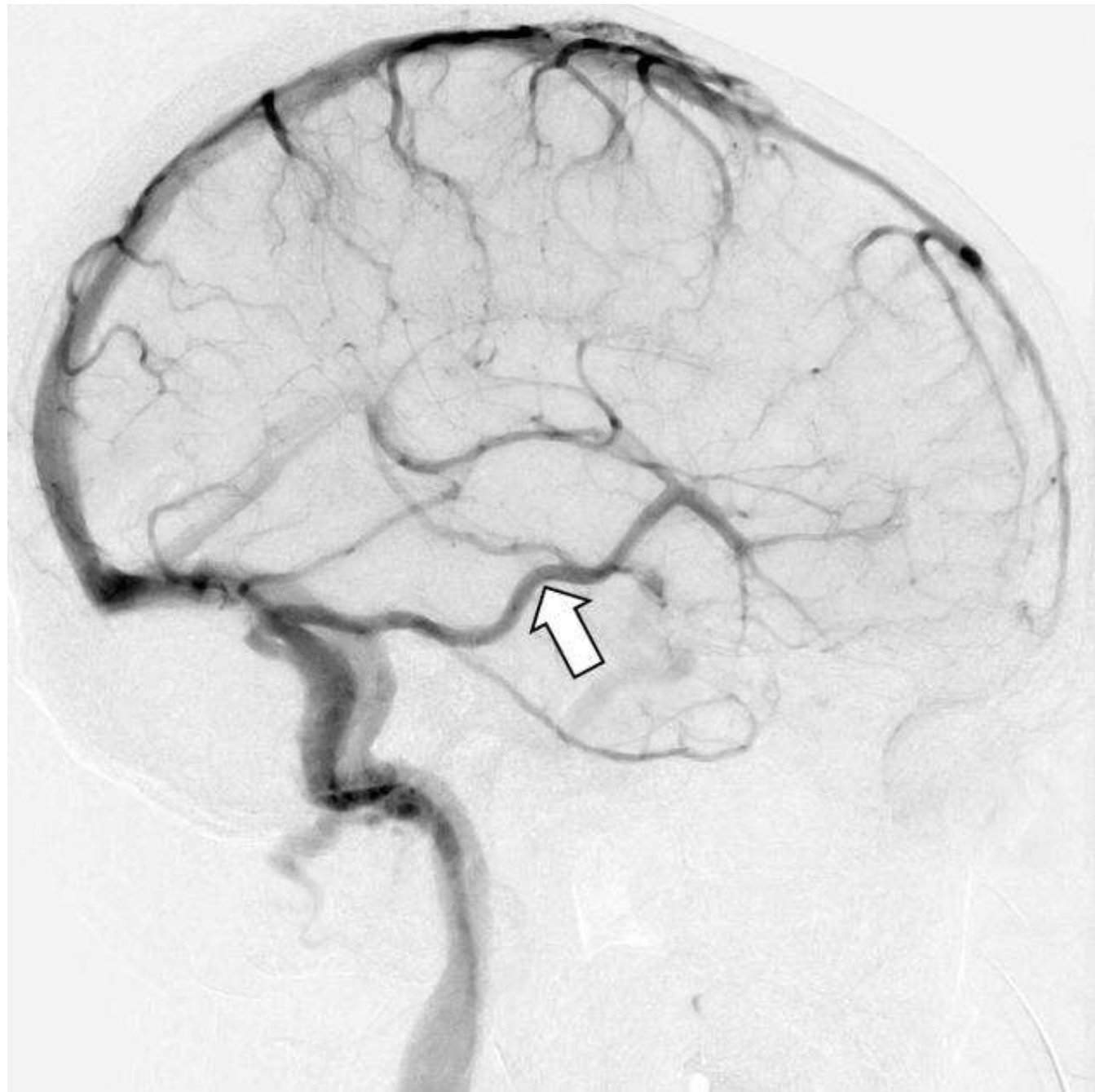


Žíly okcipitální směřují kraniálně - interhemisferický přístup



Venogram – povrchové žíly

Labého žíla



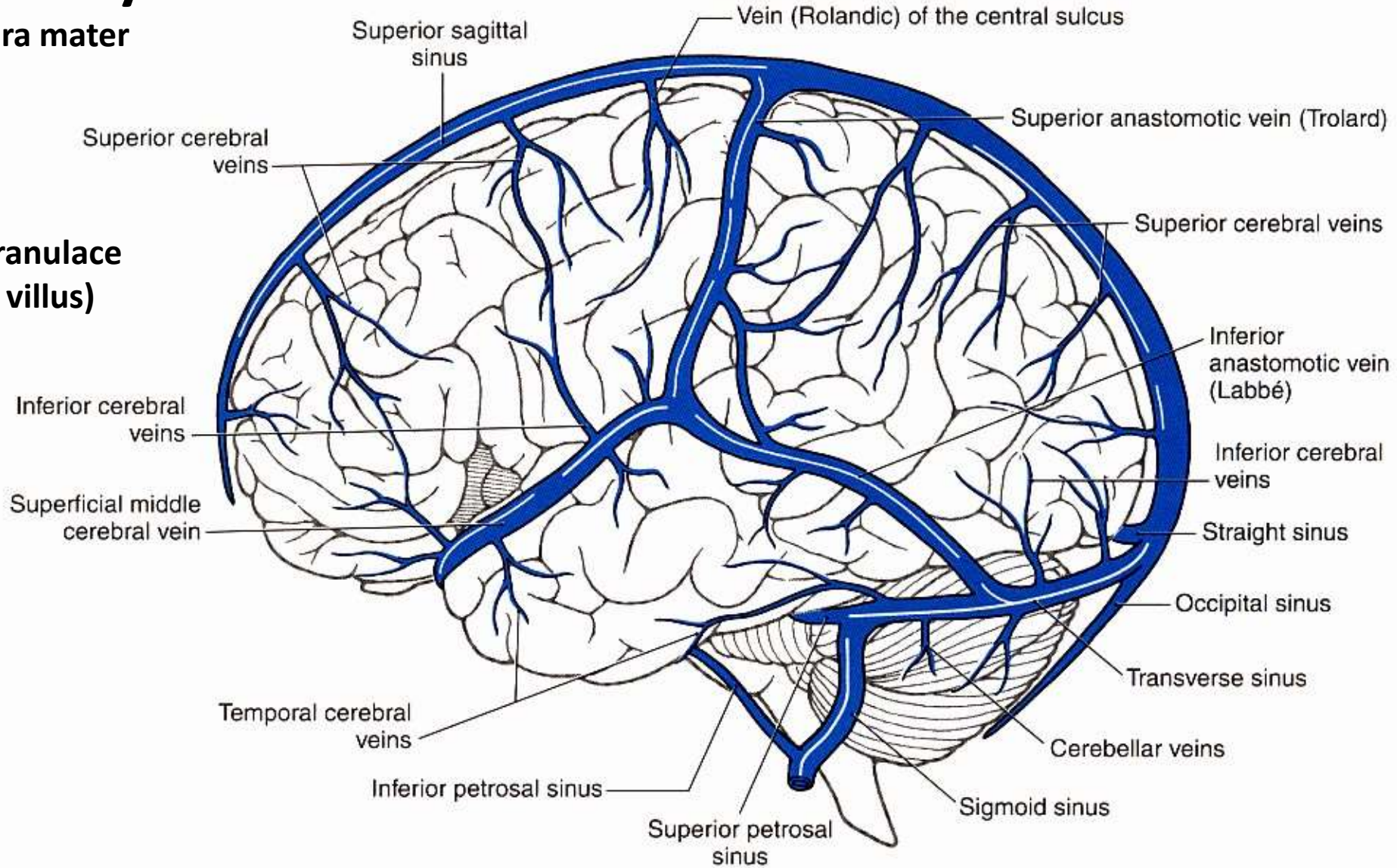
Mozkové siny:

duplikatura dura mater

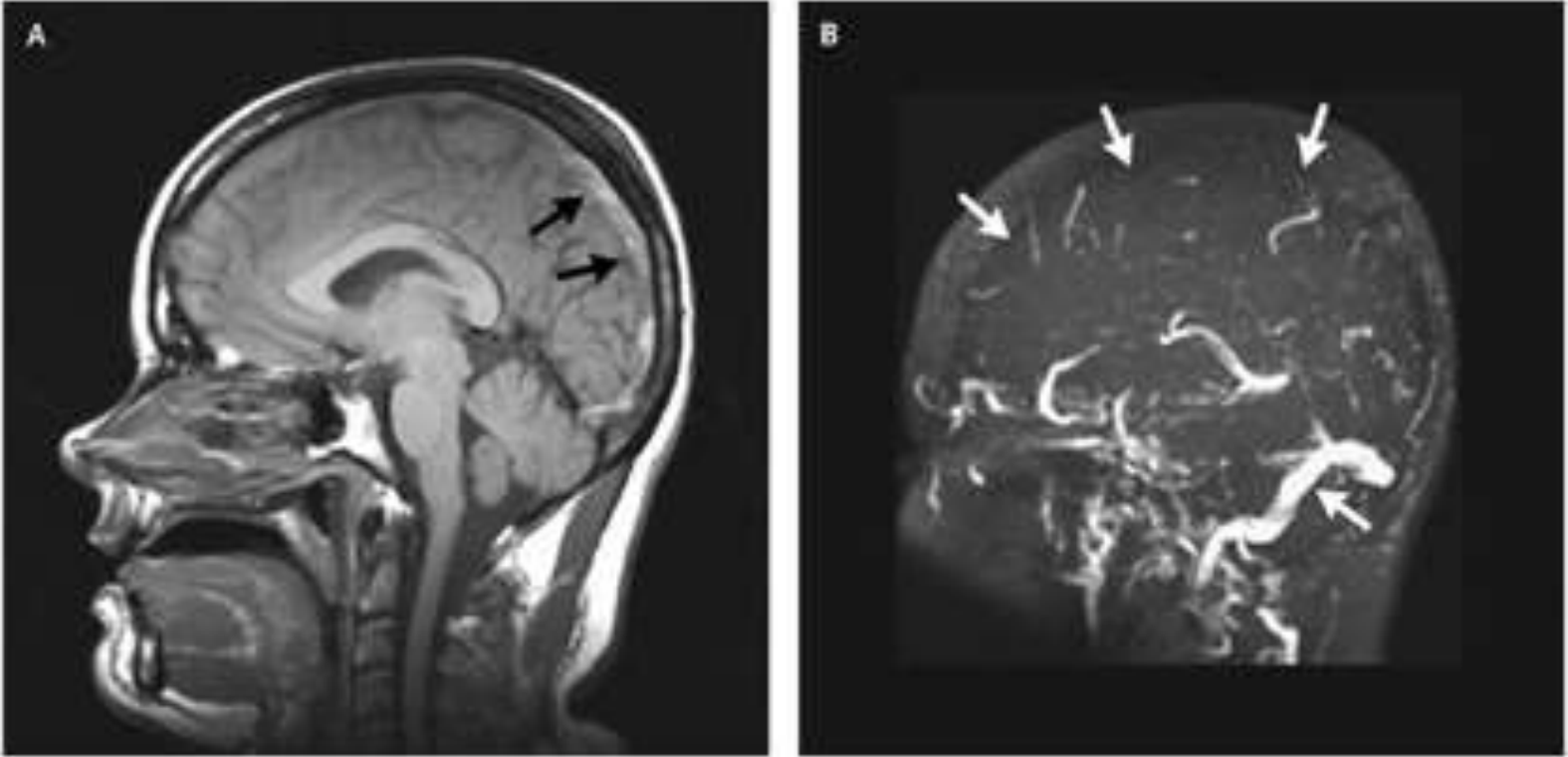
Endostální

Meningeální

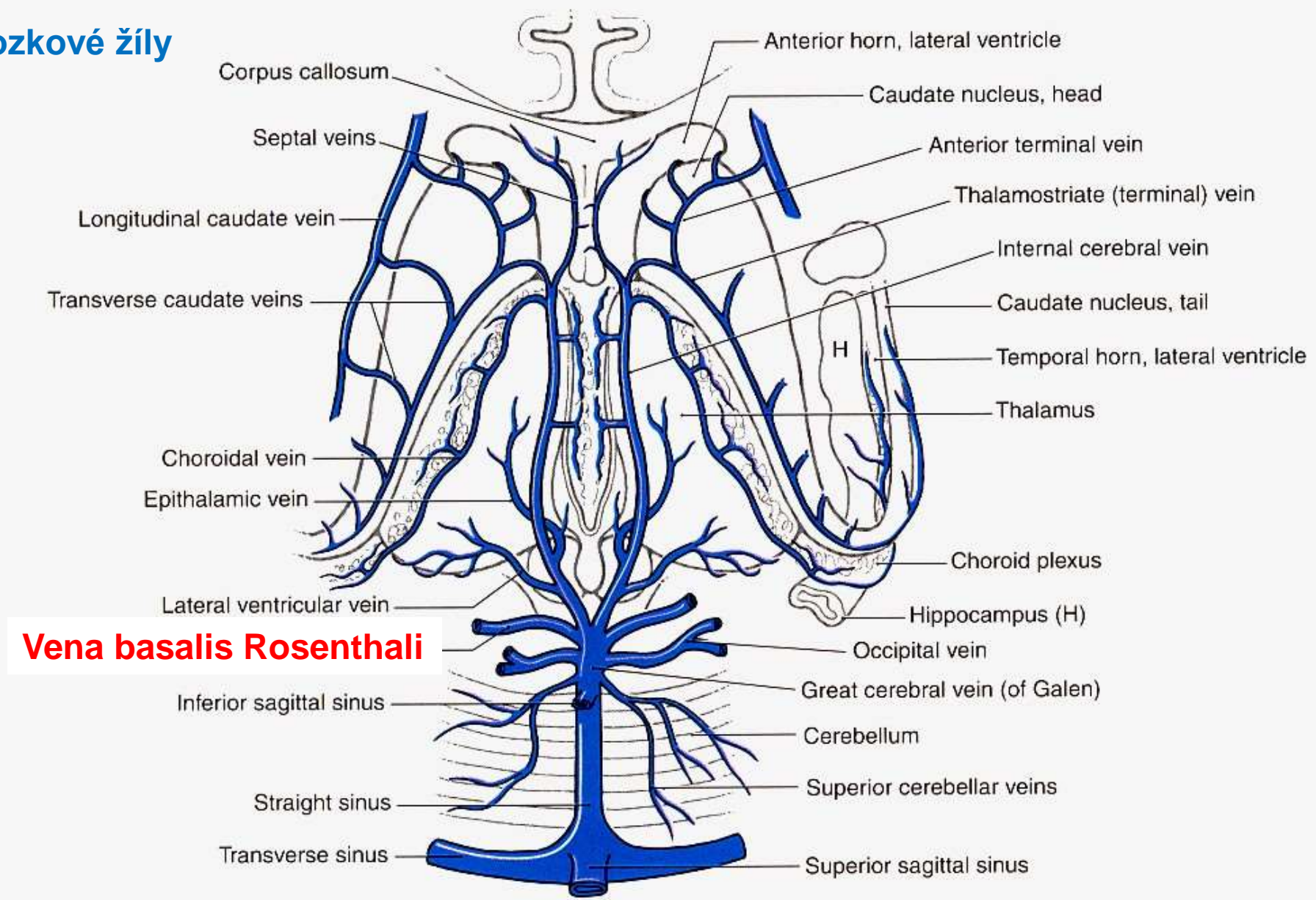
Pachionniho granulace
(arachnoidální villus)



Trombosa sinus sagittalis superior



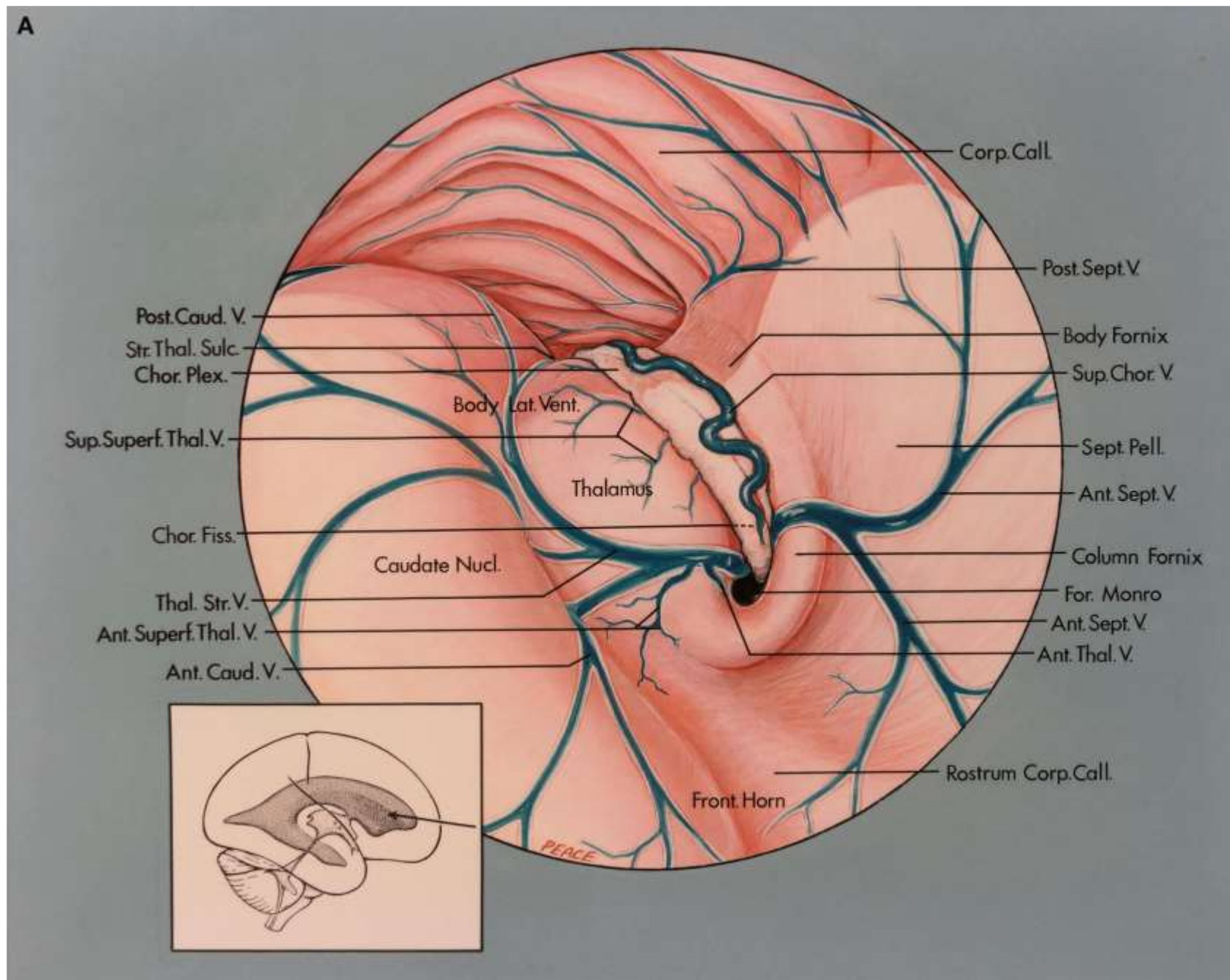
Hluboké mozkové žíly

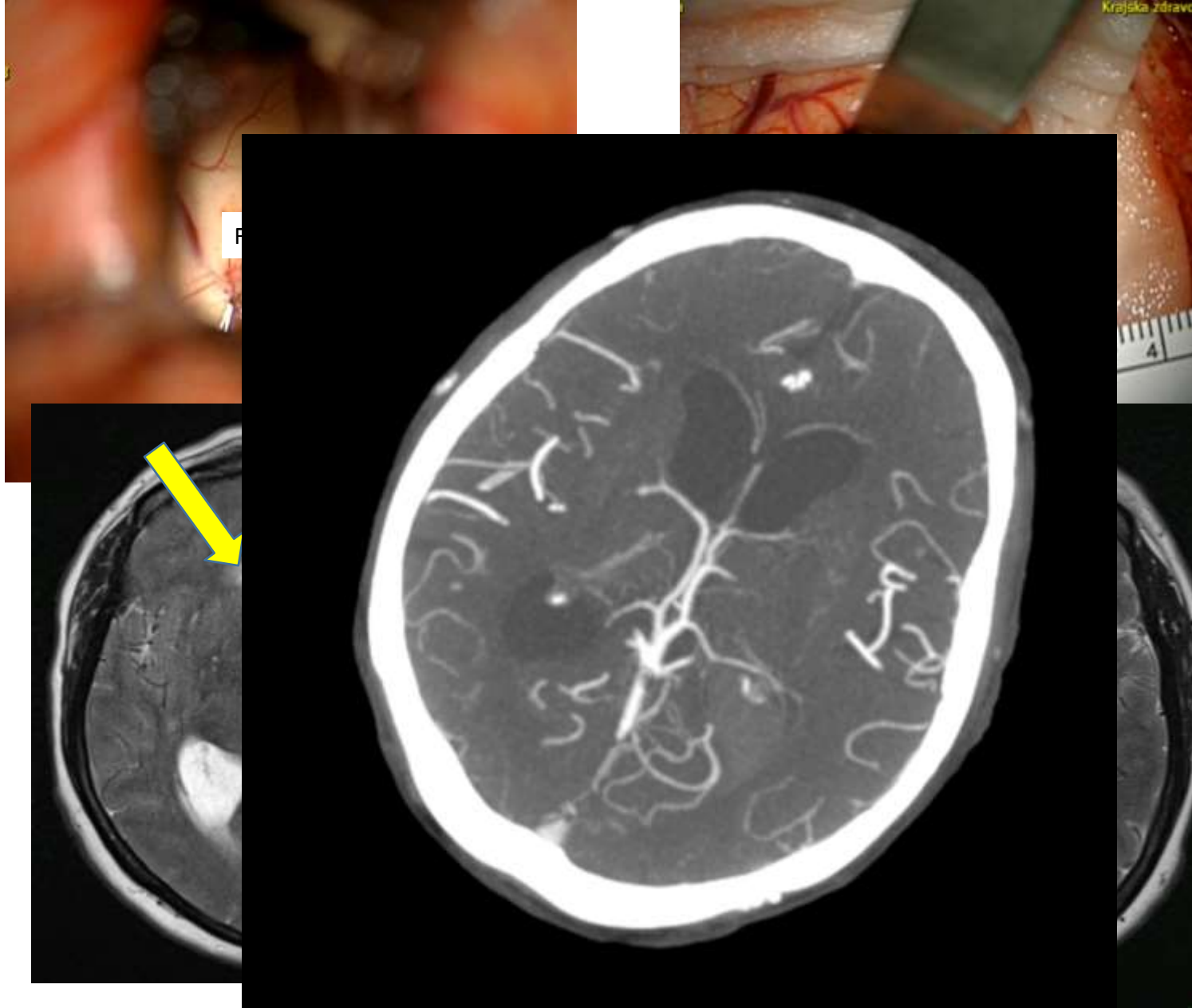


Vena basalis Rosenthalii

Figure 8-17. Veins draining internal areas of the hemisphere and the tributaries of the great cerebral vein and straight sinus, hippocampus.

Žíly sbíhající se do
v. cerebri interna
Pohled **zepředu** shora do
centrální části laterální komory

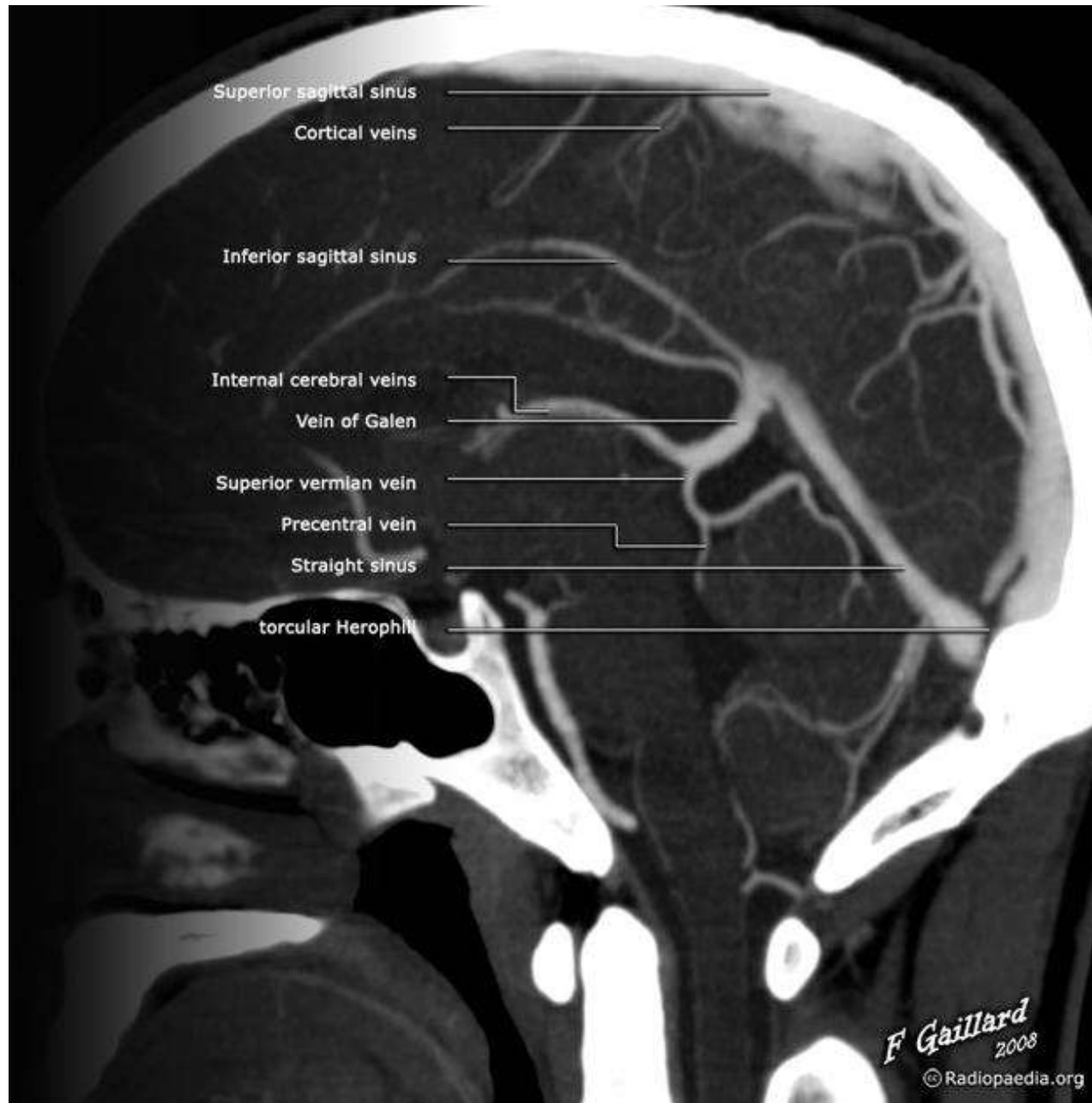




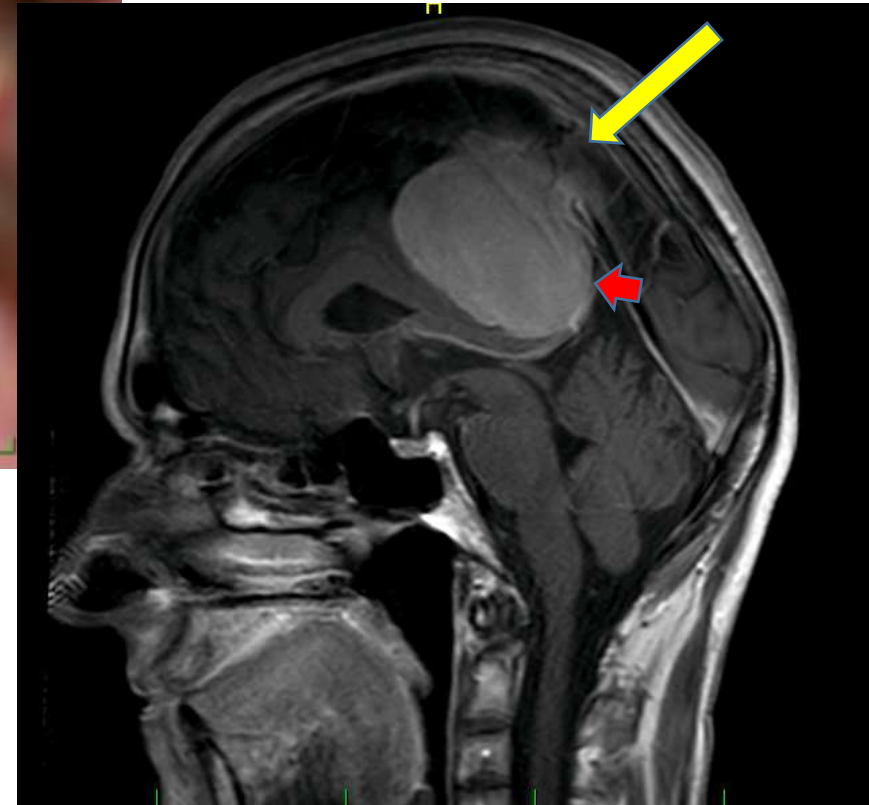
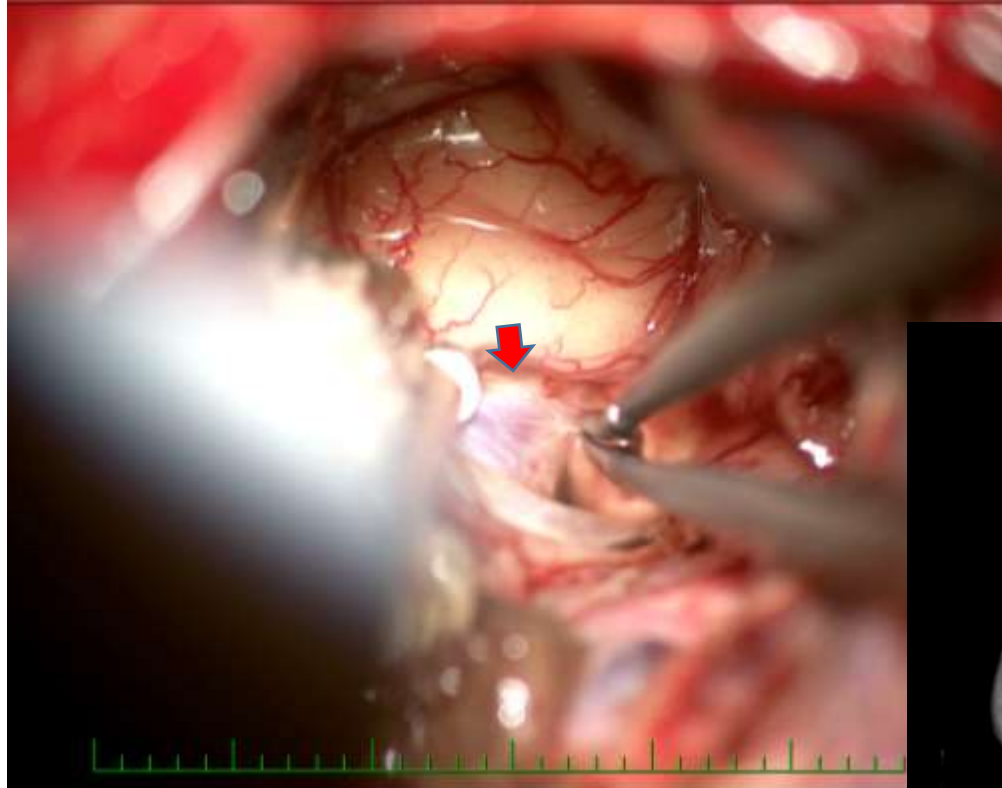
Venózní úhel: v. thalamostriata + v. septi + v. choroidea = v. cerebri interna + v. basalis Rosenthalii = vena magna Galeni

Hluboké žíly – venogram

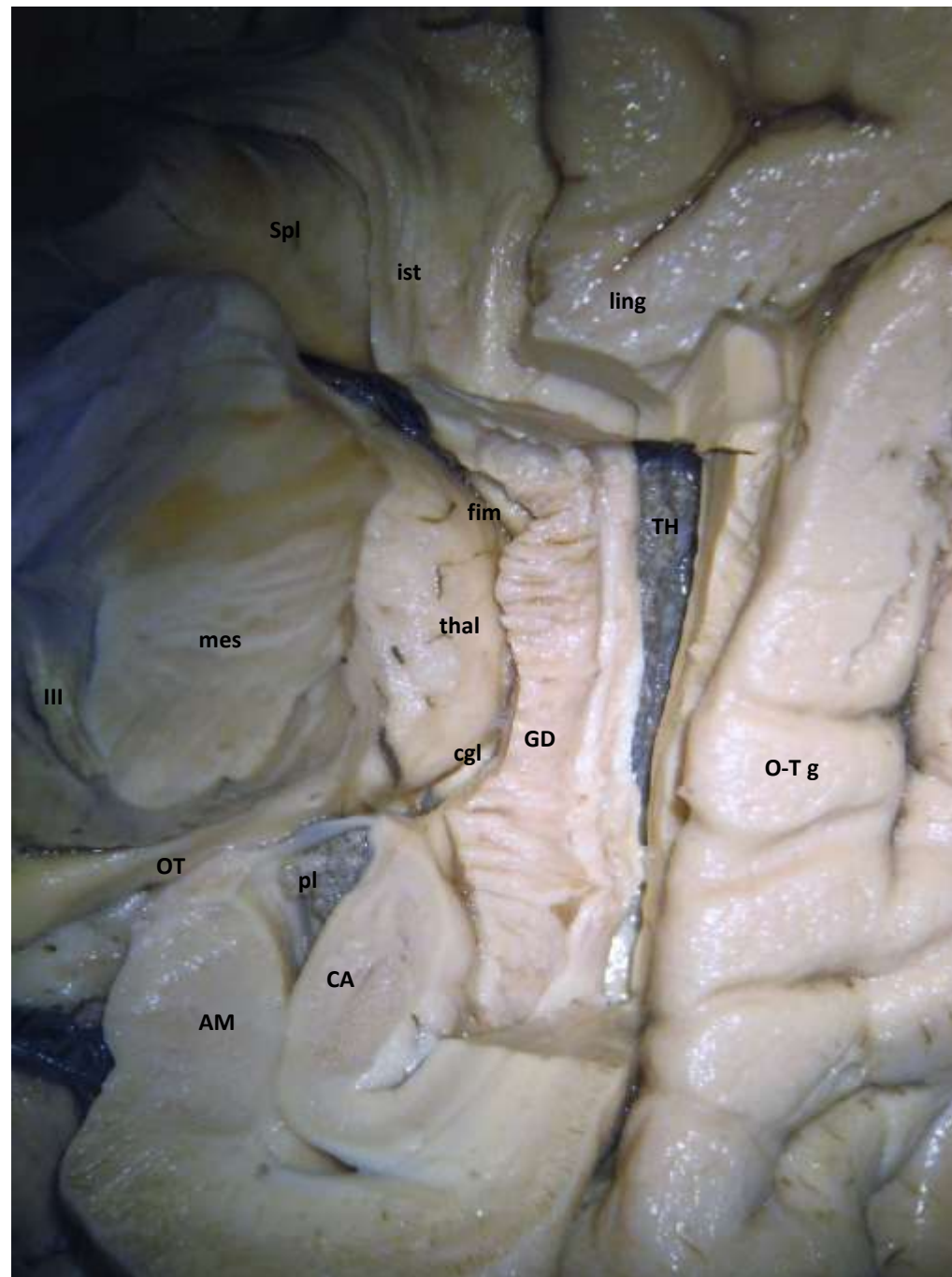
Sinus saggitalis inferior
+ VMG
= Sinus rectus

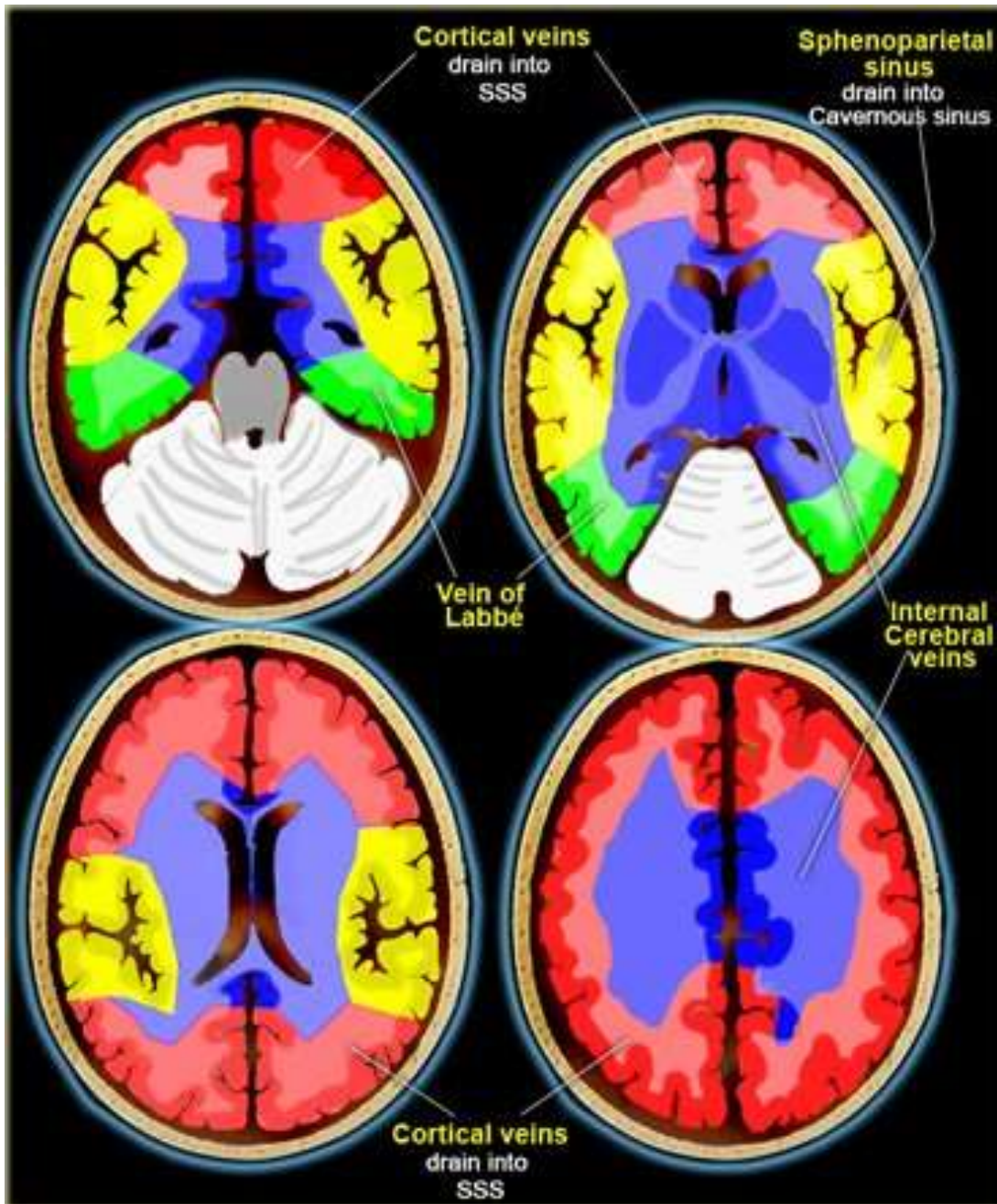


V. magna Galeni



**Vena basalis Rosenthali
drénuje mediotemporální oblast**



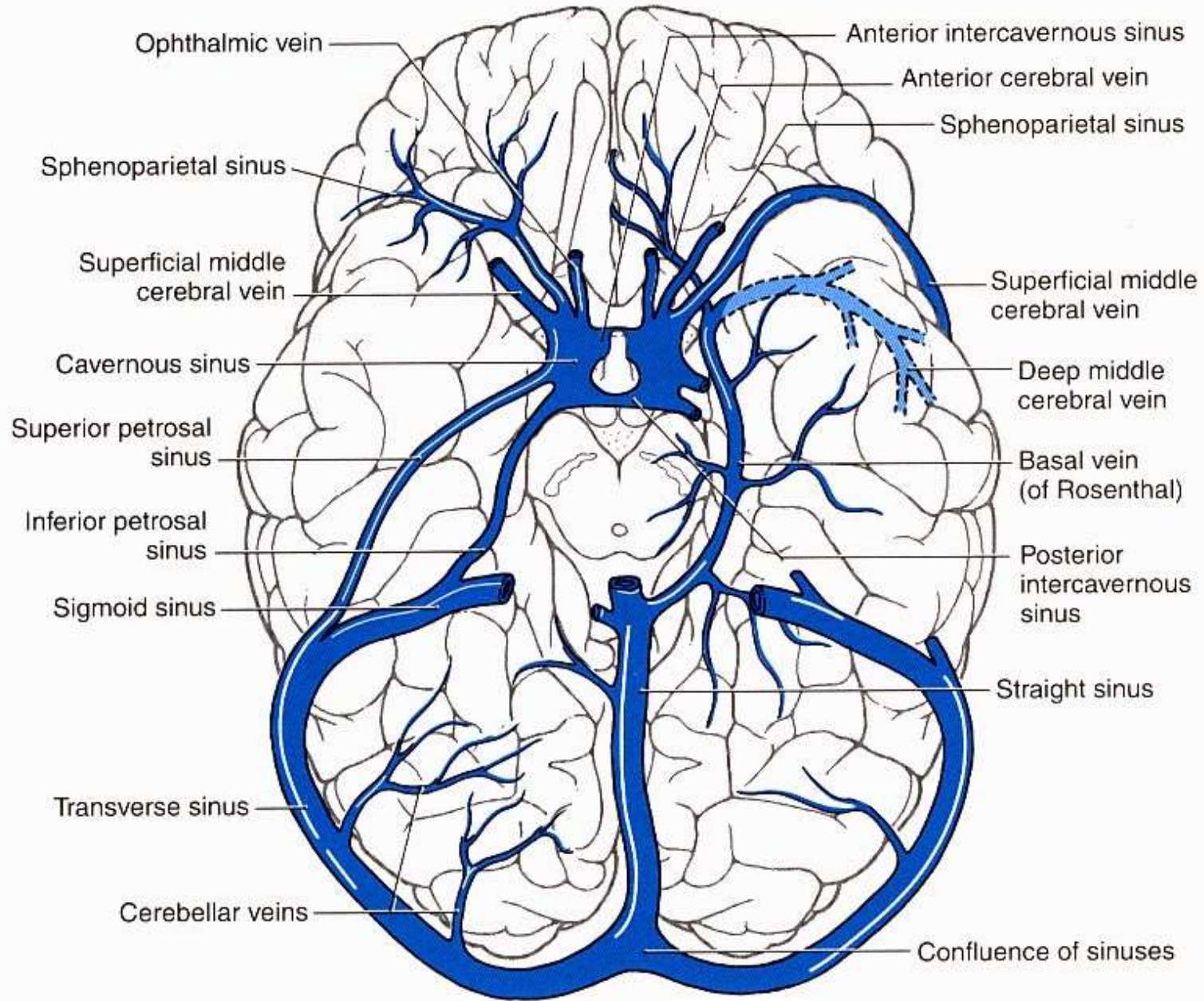


Cerebral Venous territories „rough guide“

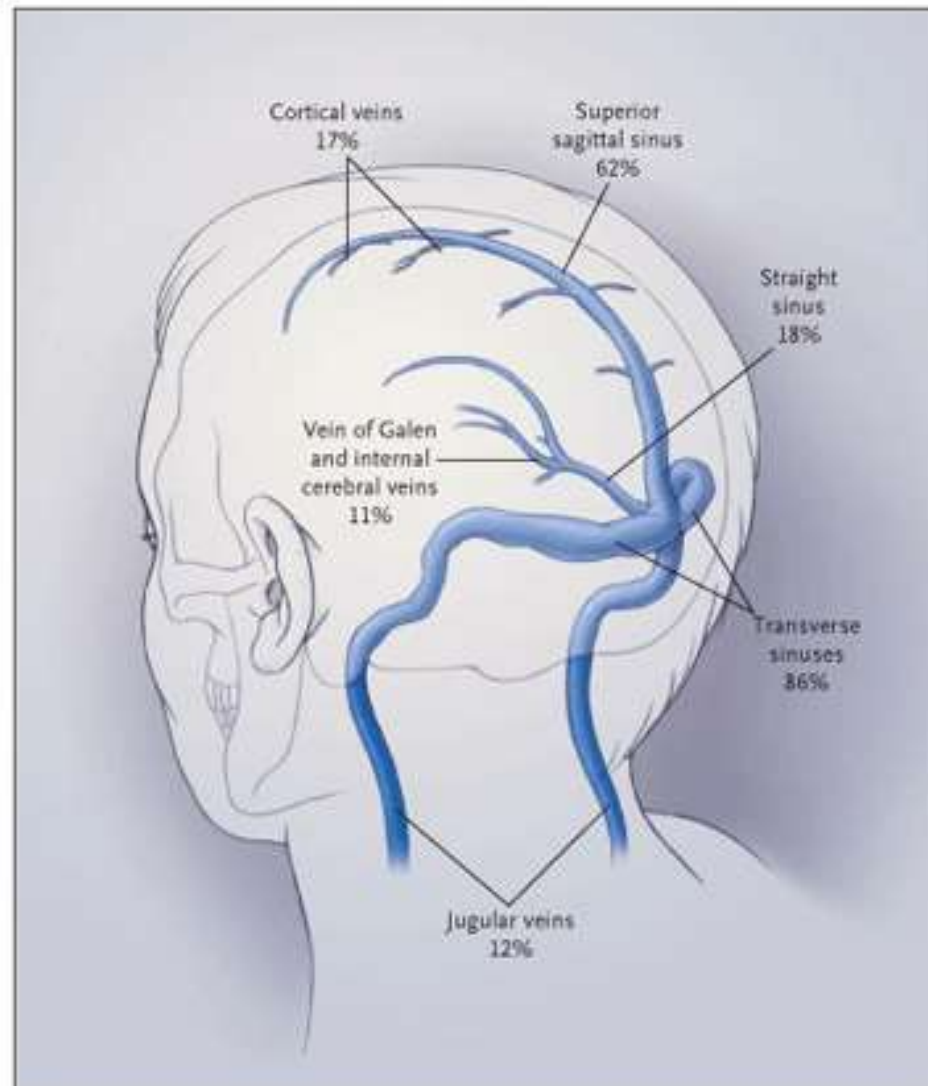
- superior sagittal sinus
- internal cerebral veins
- sphenoparietal sinus
- vein of Labbé

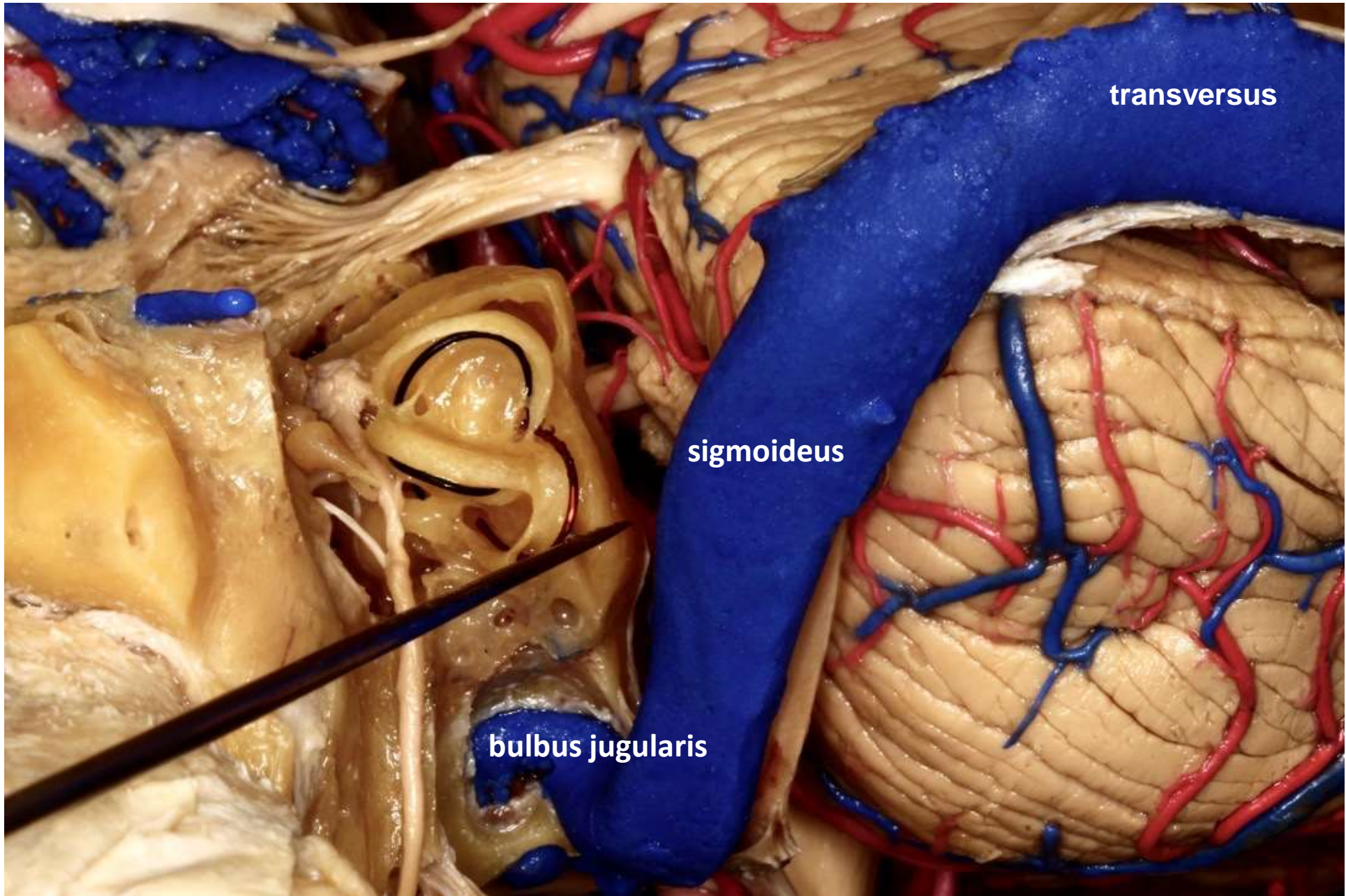
Dokončení žilních sinů

Sinus occipitalis
Sinus transversus
Sinus sigmoideus
Jugulární bulbus
Sinus petrosus sup.
Sinus petrosus inf.
Sinus cavernosus
Sinus sphenoparietalis



Žíly mozku - odtok přes žilní splavy do **v. jugularis interna**:
častá asymetrie (dominance sinus transversus vpravo)
žilní emissaria

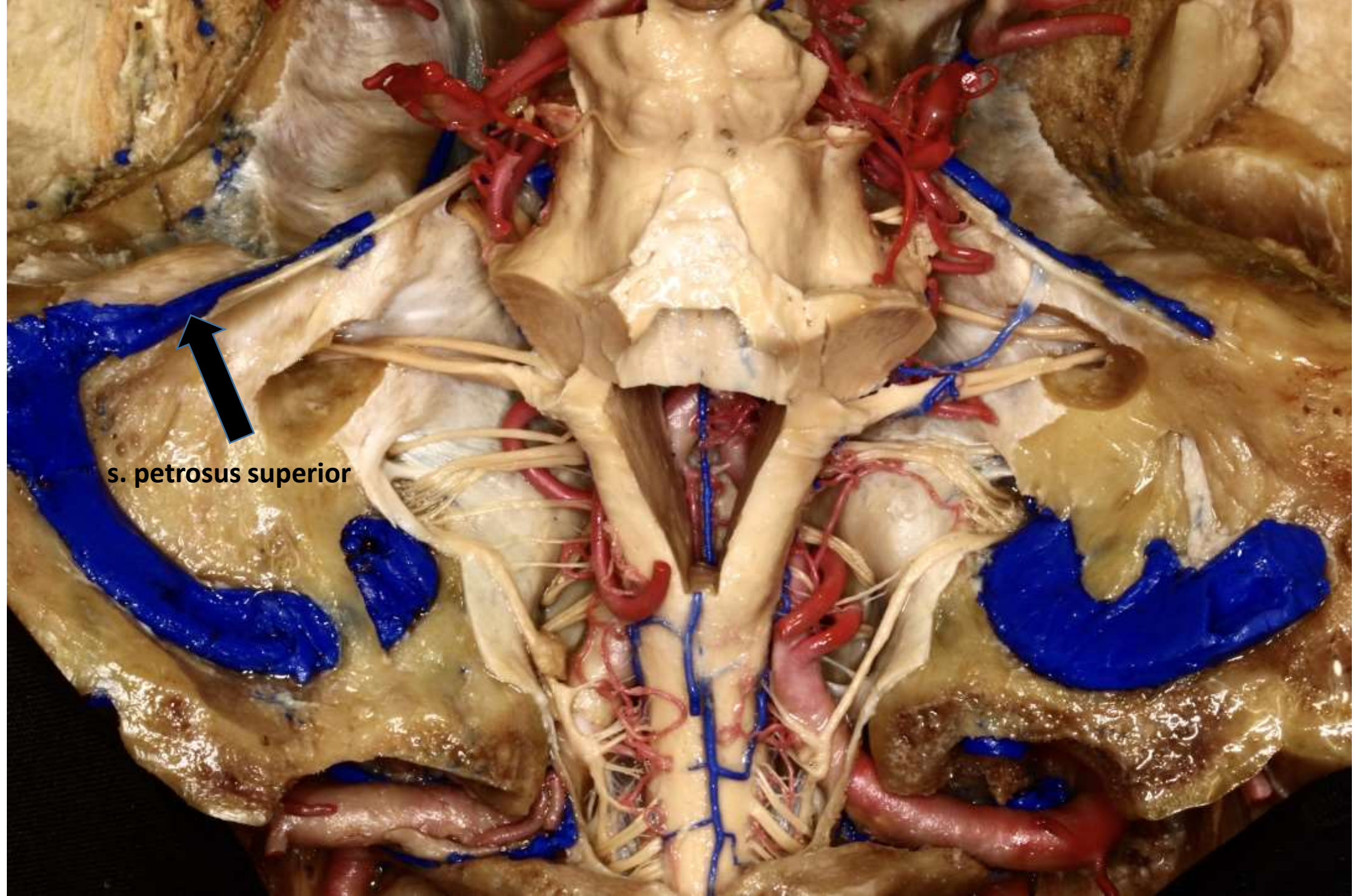




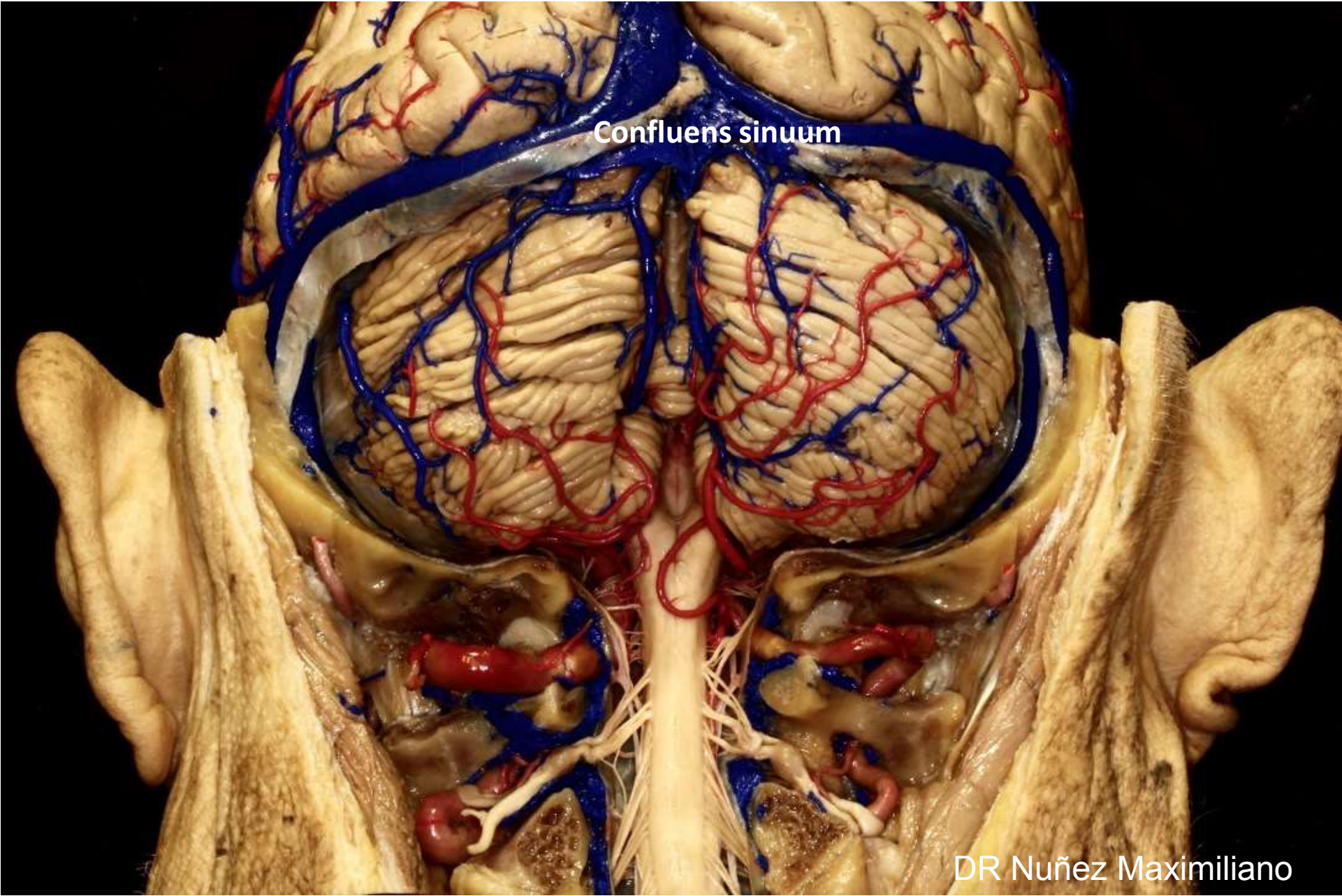
transversus

sigmoideus

bulbus jugularis

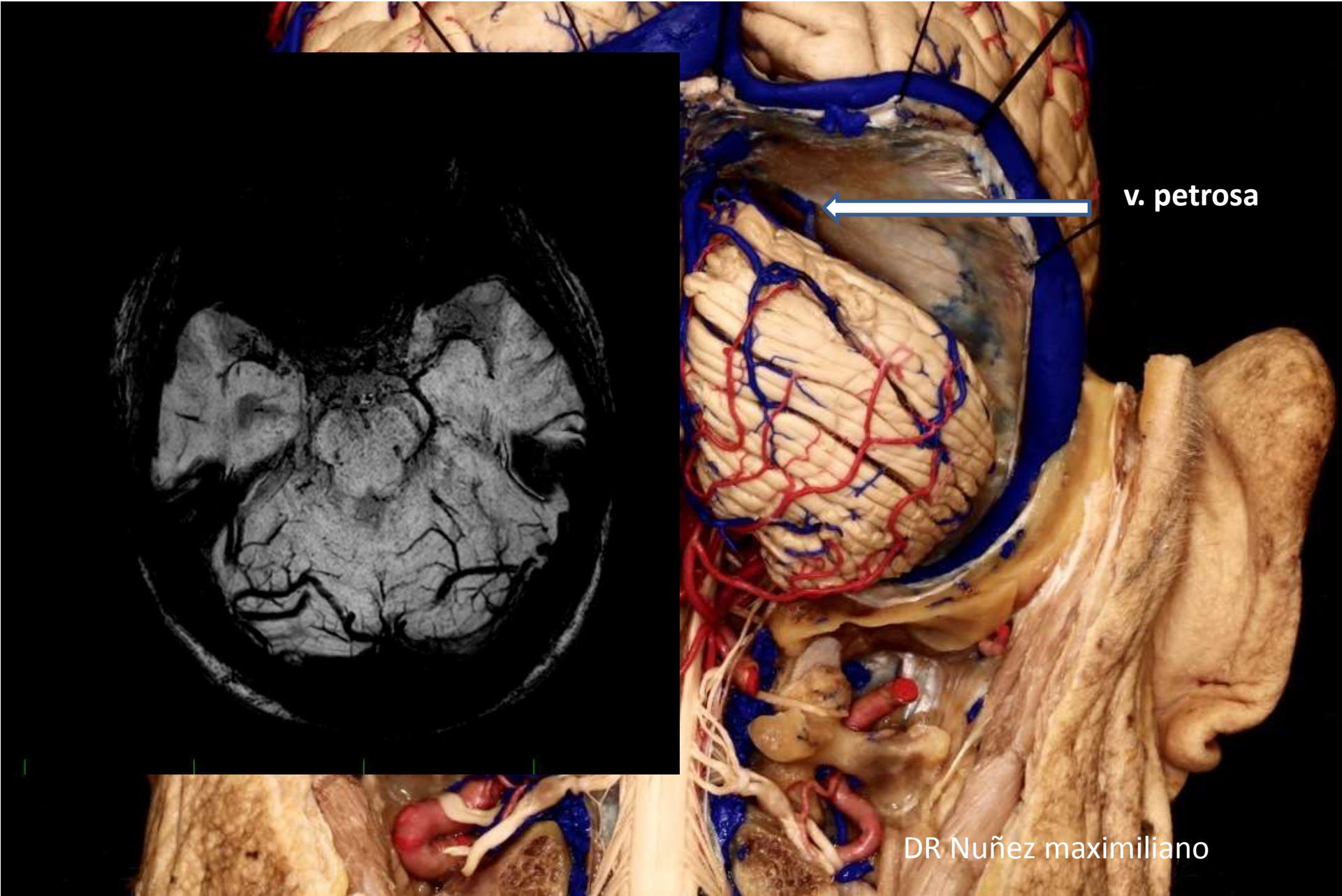


s. petrosus superior



Confluens sinuum

DR Nuñez Maximiliano



v. petrosa

DR Nuñez maximiliano