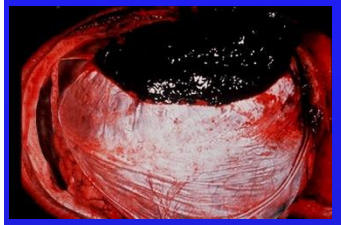
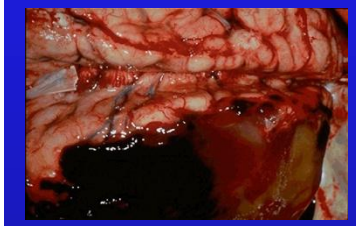
Intrakraniální krvácení

- epidurální
  - tepenné
  - bikonvexní tvar
  - nepřekračuje hranice švů



- subdurální
  - žilní
  - konvexně-konkávní tvar
  - překračuje švy



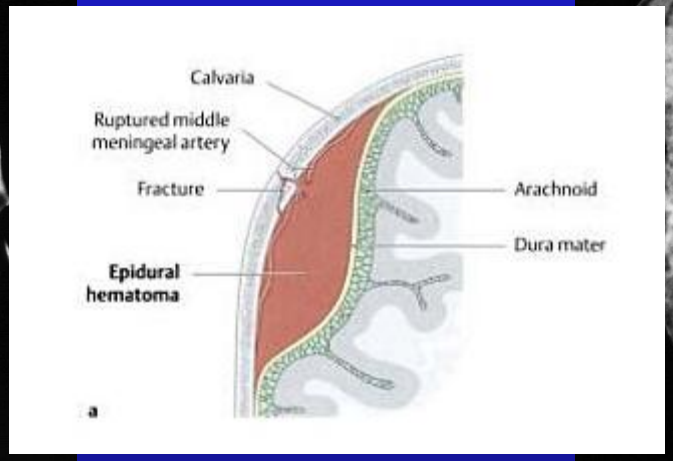
typicky traumatické etiologie

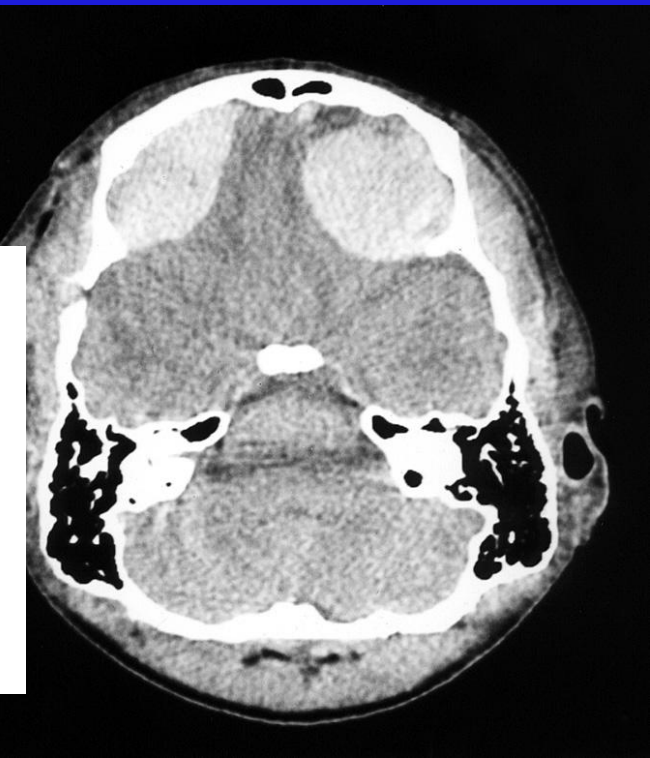
- subarachnoidální
  - traumatické
  - ruptura aneuryzmatu
- intraparenchymové
  - traumatické
  - hypertonické

i jiná etiologie

Traumatické intrakraniální krvácení

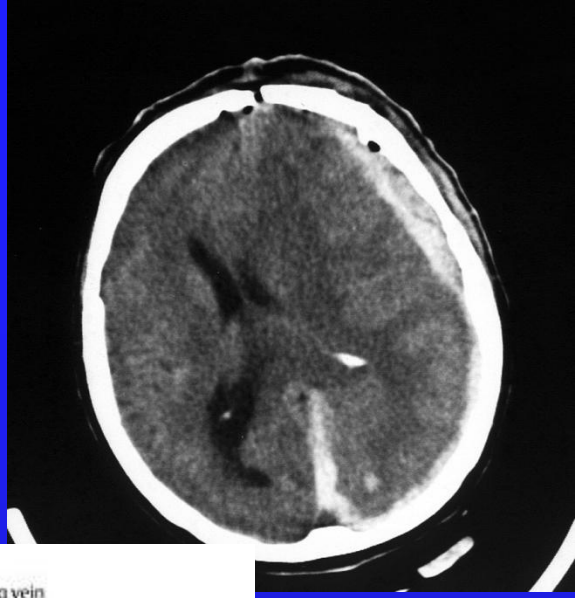
- epidurální
  - Tepenné
  - bikonvexní tvar (čočkovitý)
  - nepřekračuje hranice švů
  - urgentní stav !

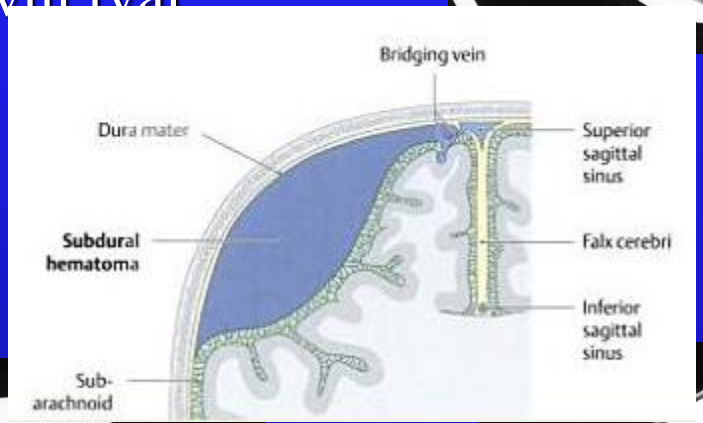


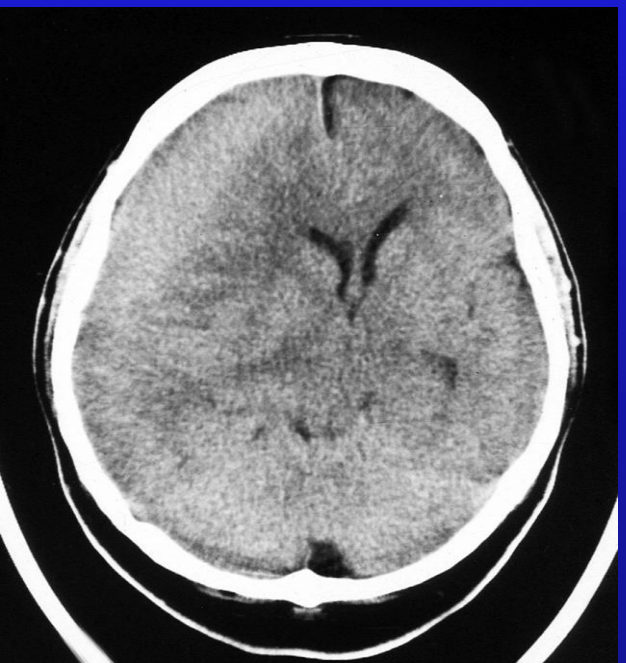


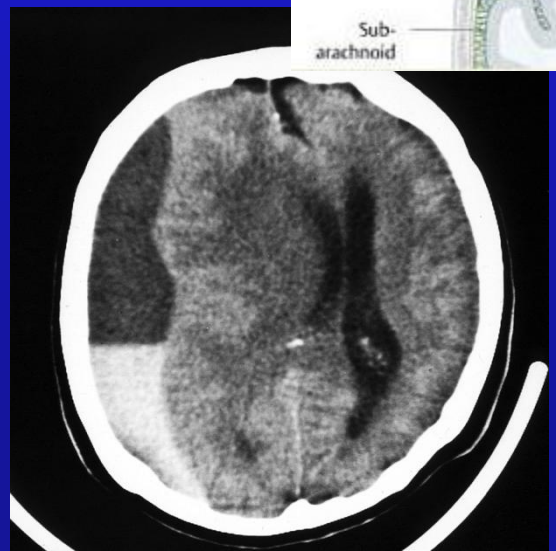
Traumatické intrakraniální krvácení

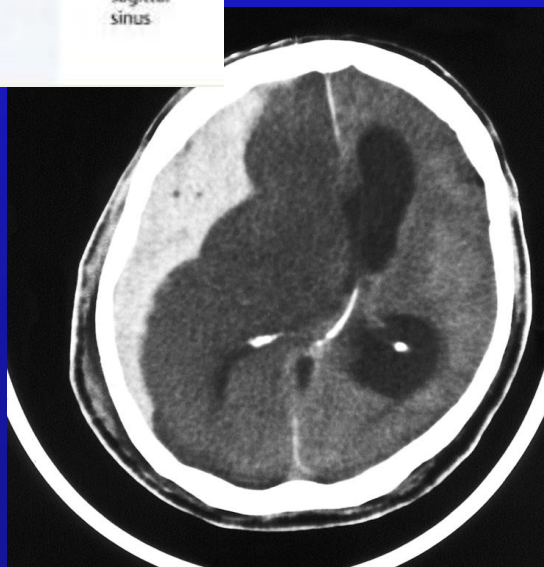
- subdurální
  - žilní (kortikální žíly)
  - konvexně-konkávní tvar
  - překračuje švy

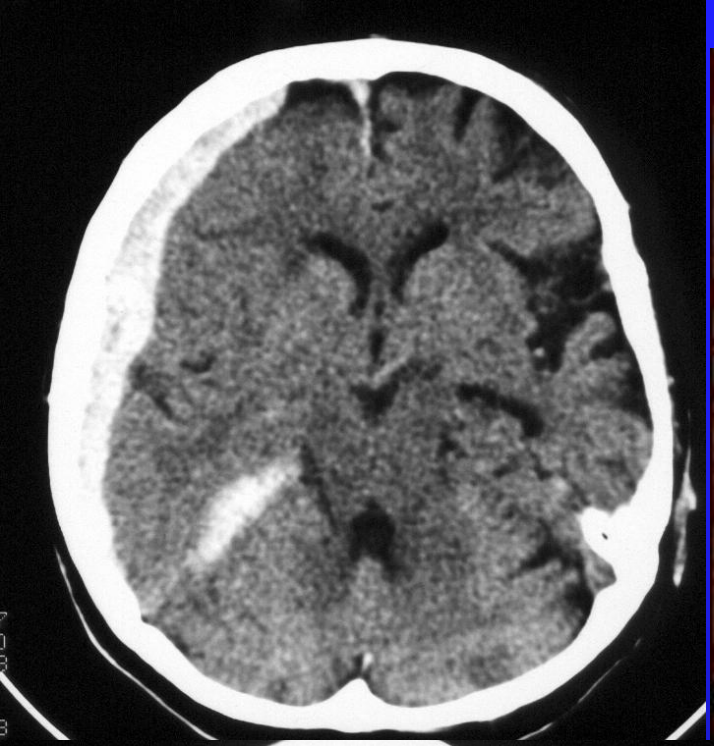


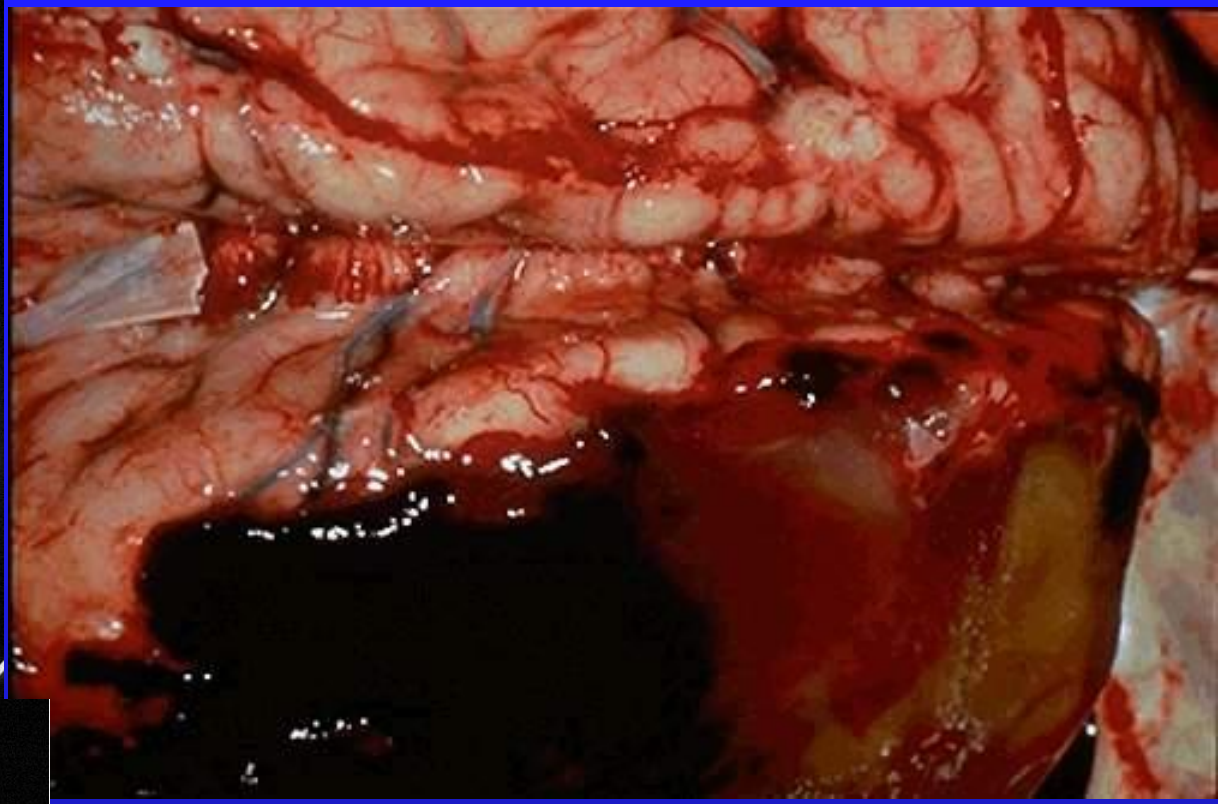


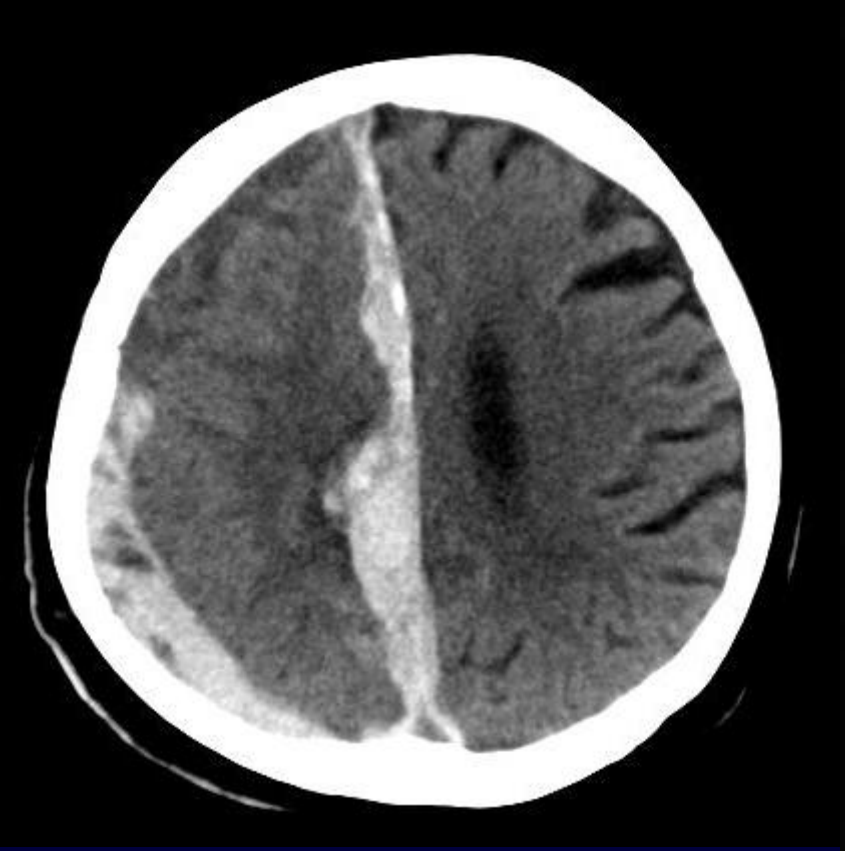


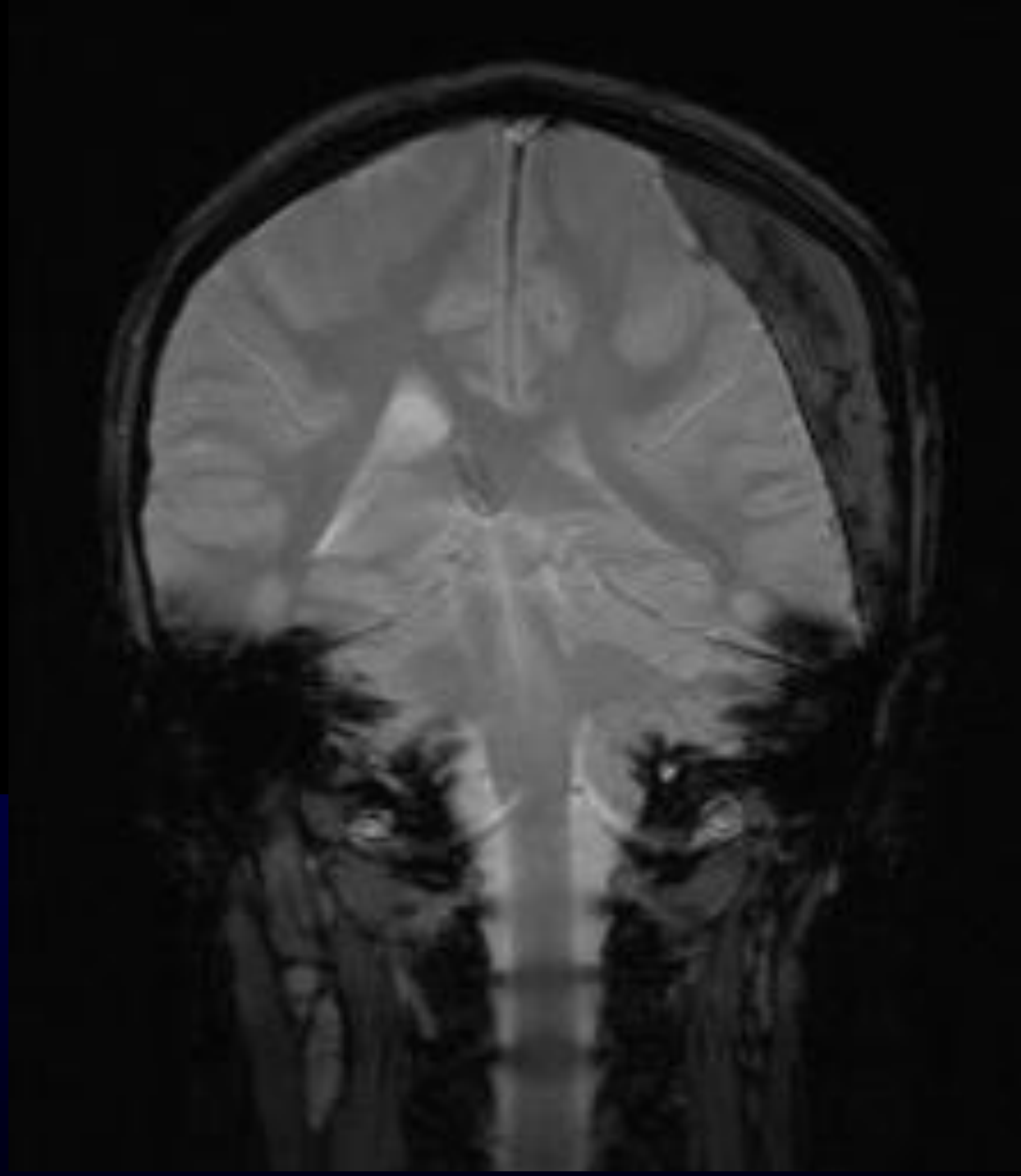






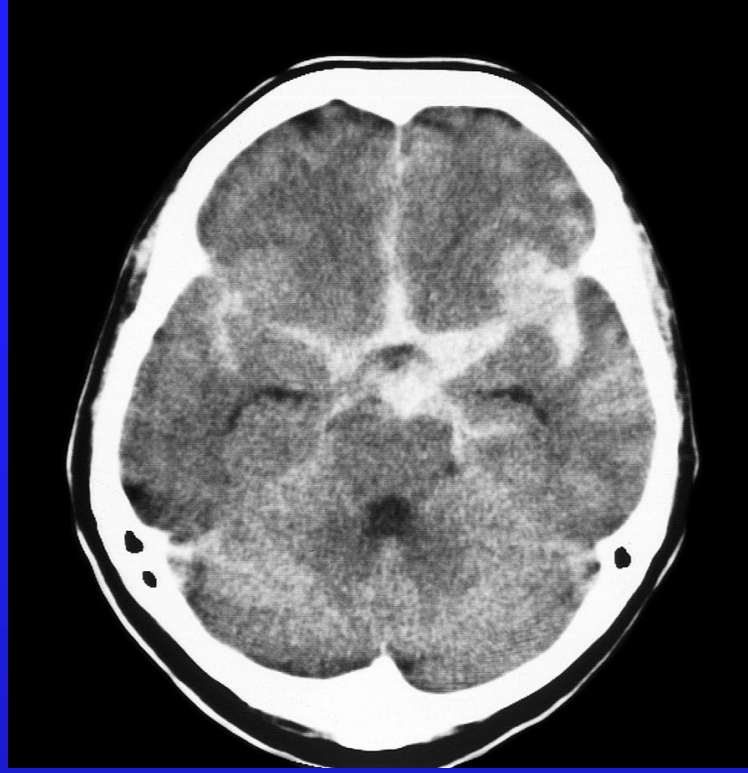


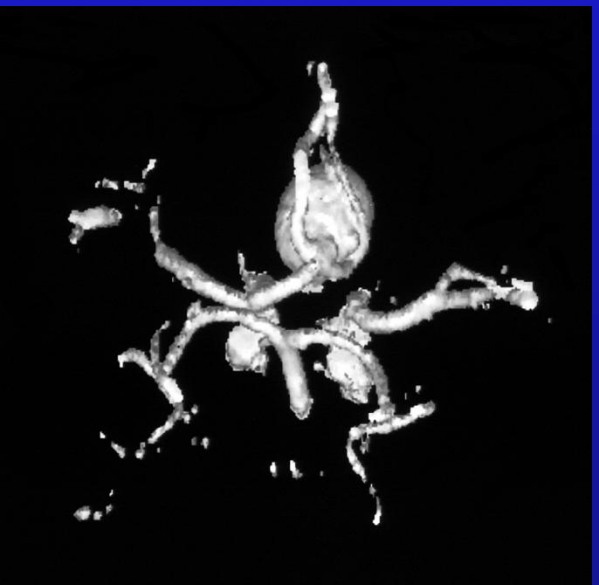


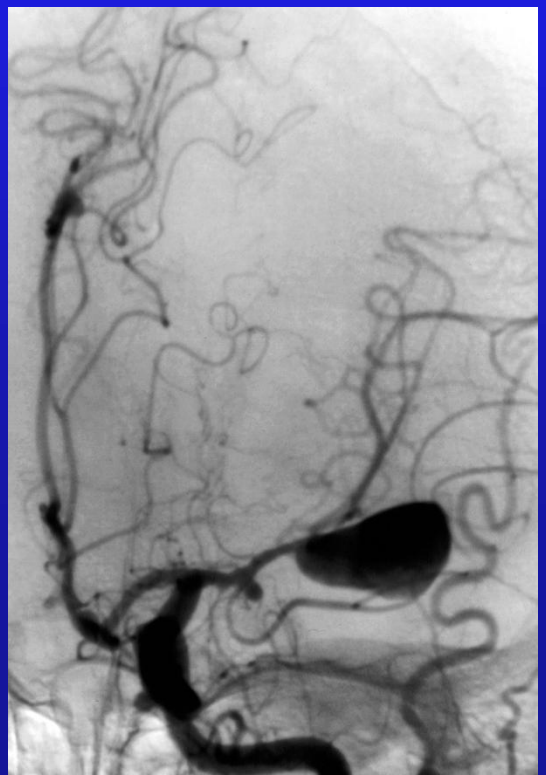


Intrakraniální krvácení

- subarachnoidální
  - traumatické
  - ruptura aneuryzmatu

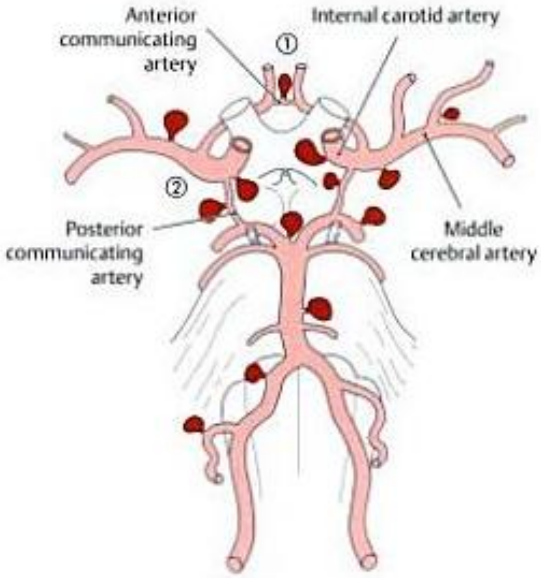






Fischerova škála pro SAK

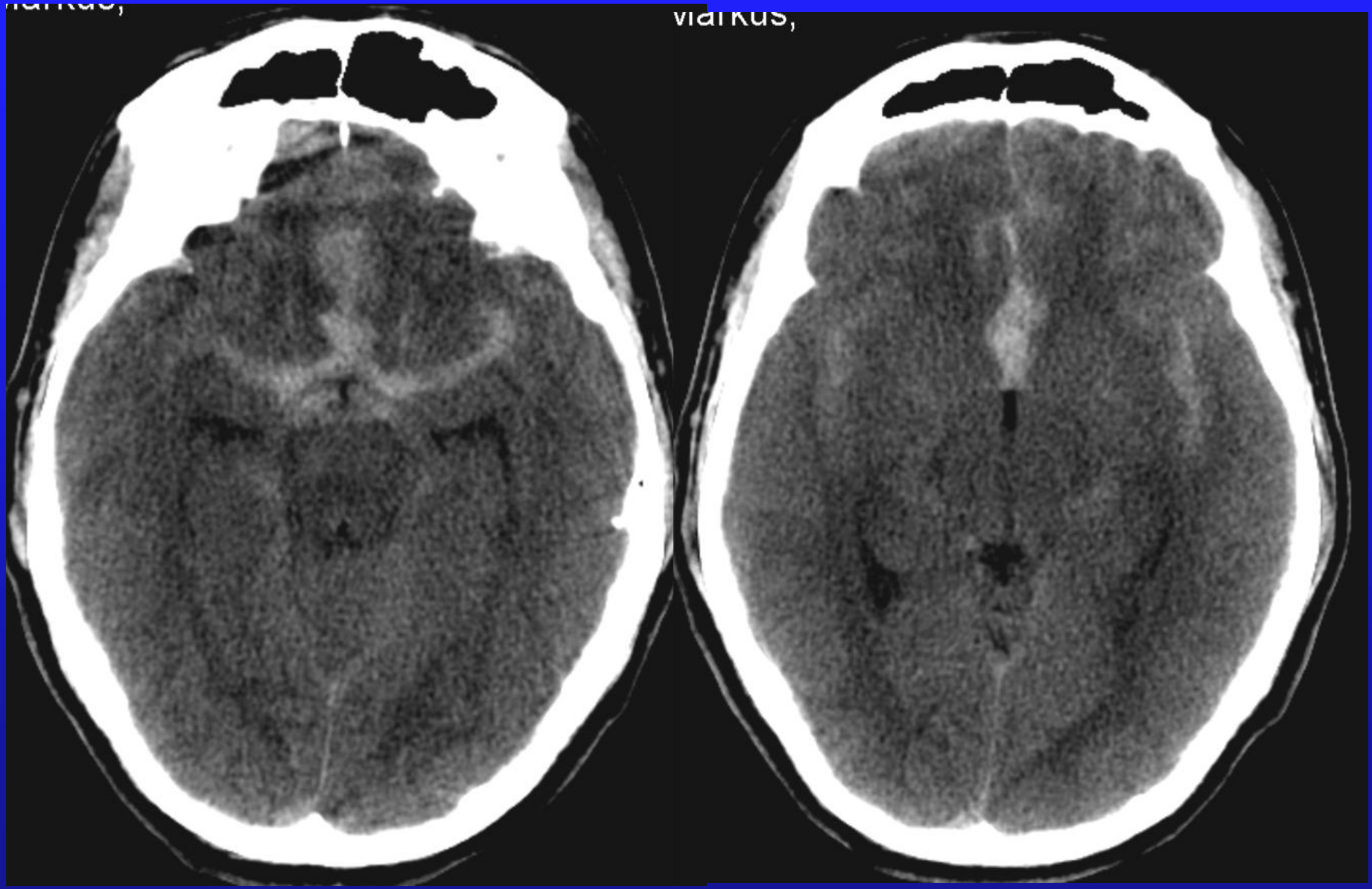
Grade	Blood on CT
1	No subarachnoid blood detected
2	Diffuse or vertical layers <1mm thick
3	Localized clot or/and vertical layers ≥ 1mm
4	Intracerebral or intraventricular clot with diffuse or no SAH

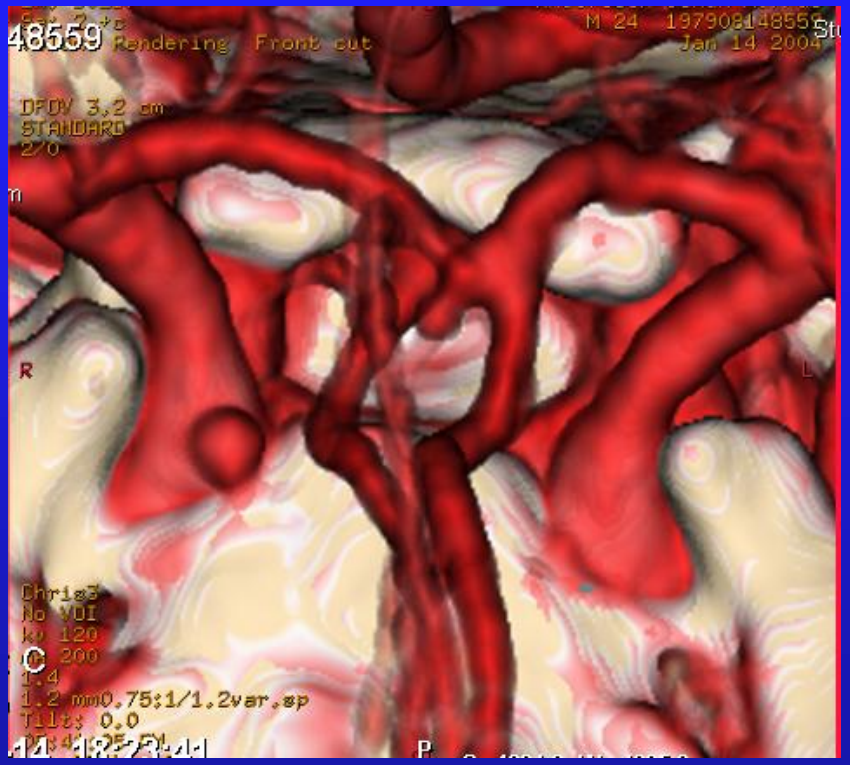


▶ **TABLE 2-14.** MODIFIED RANKIN SCALE

Score	Impairments
0	No symptoms at all
1	No disability despite symptoms
2	Slight disability but does not require assistance
3	Moderate disability but can walk
4	Moderately severe disability
5	Severe disability and often bedridden
6	Dead

Univerzitní nemocnice Umea I




48559
Rendering
Front cut
M 24
Jan 14 2004
DFOV 3.2 cm
STANDARD
2/0
R
L
Chris3
No VOI
kv 120
200
1.4
1.2 mm0.75:1/1.2var.sp
Tilt: 0.0
P

48559
Rendering
Front cut
M 24
Jan 14 2004
DFOV 2.0 cm
STANDARD
2/0
R
A
S
L
P
I
Chris3
No VOI
kv 120
200
1.4
1.2 mm0.75:1/1.2var.sp
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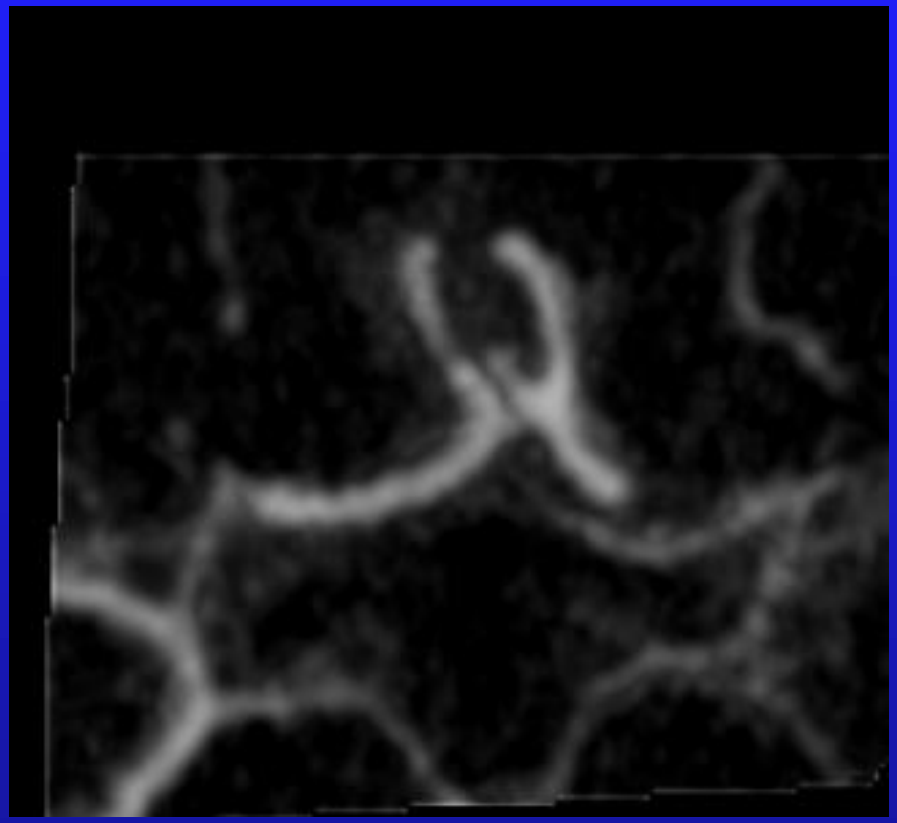
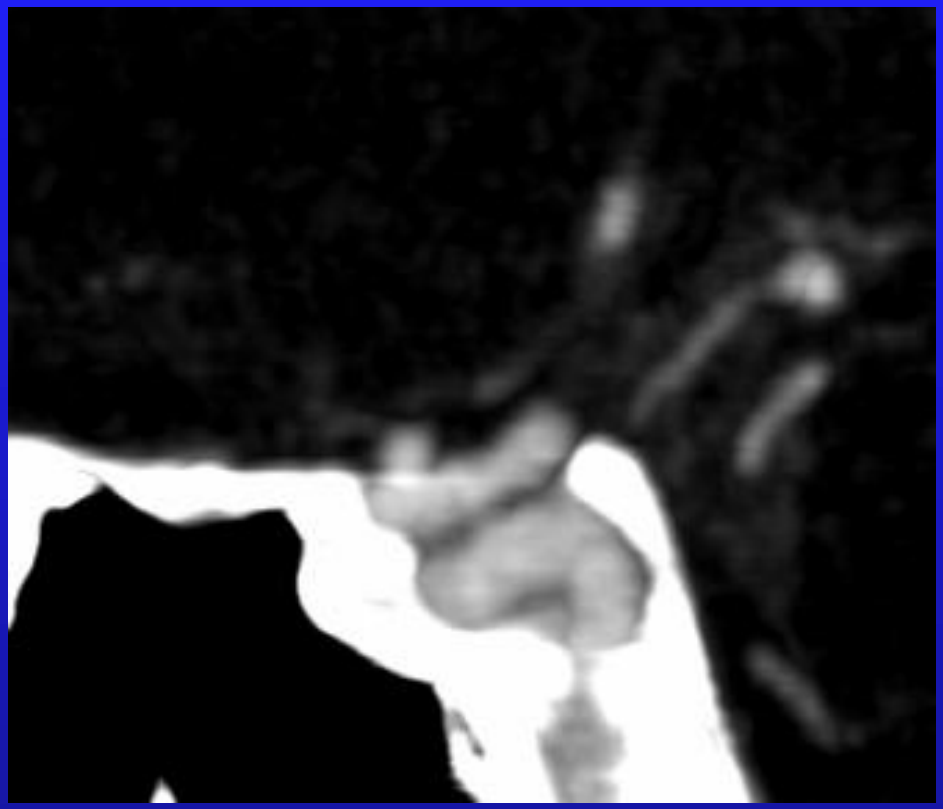
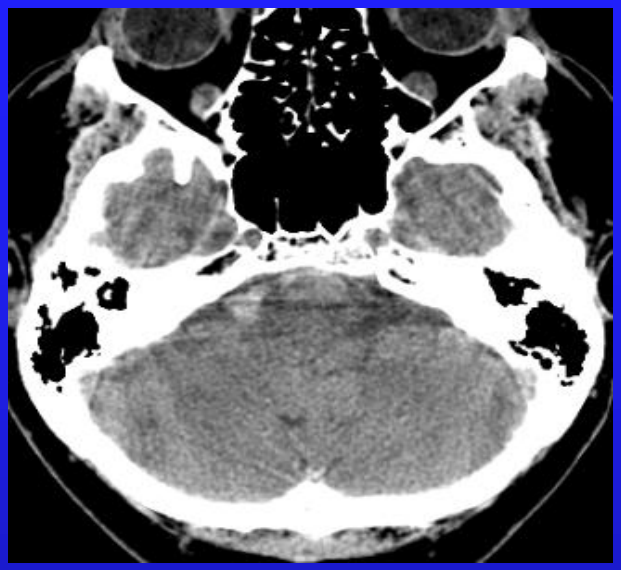
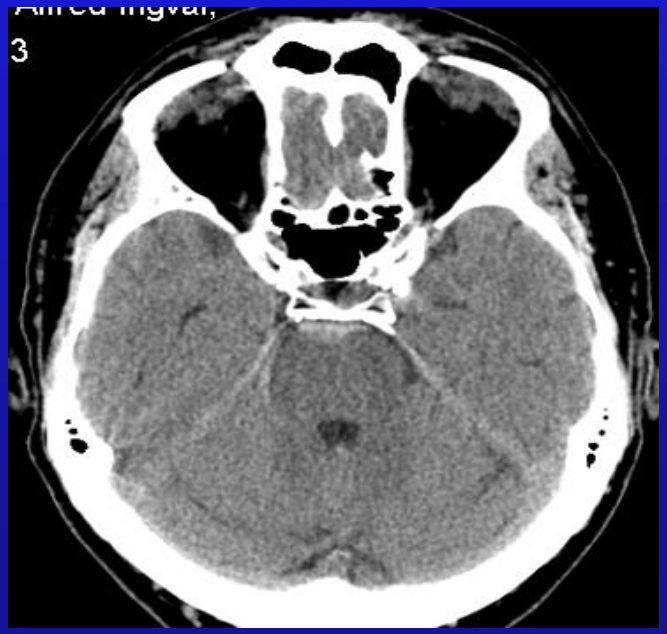
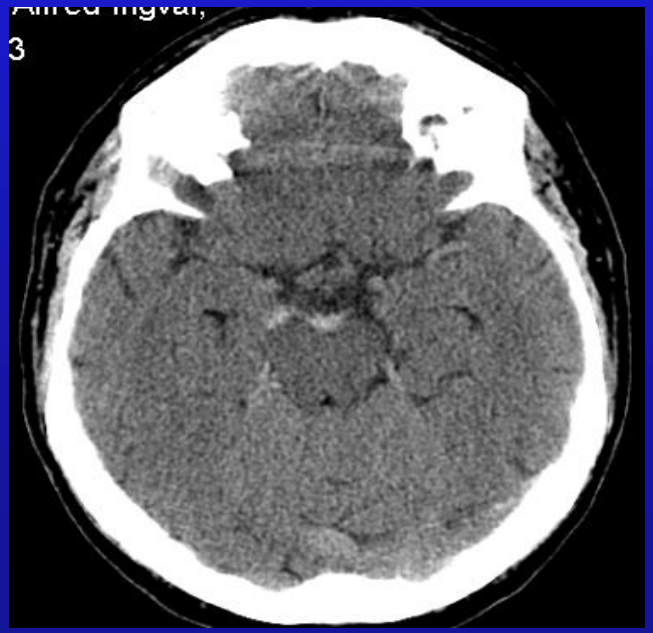




Perimezencefalické krvácení

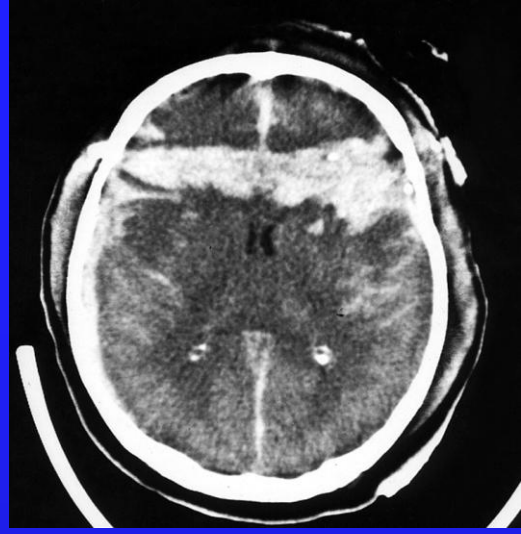


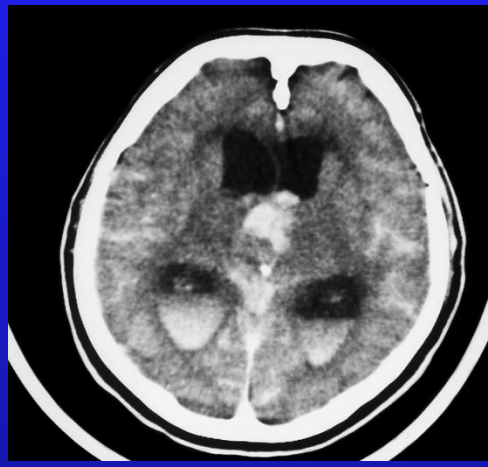


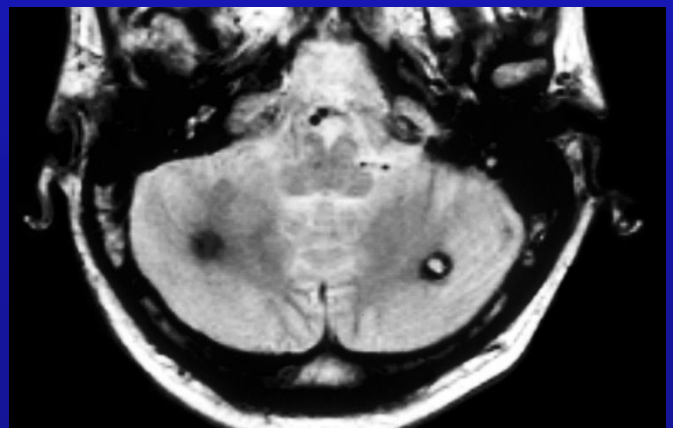


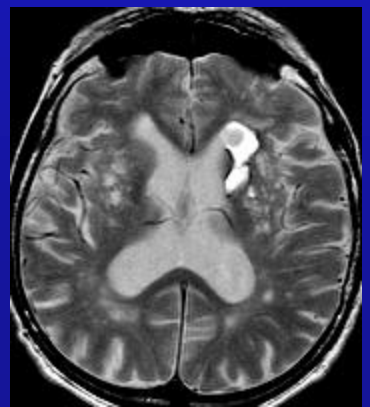
Intrakraniální krvácení

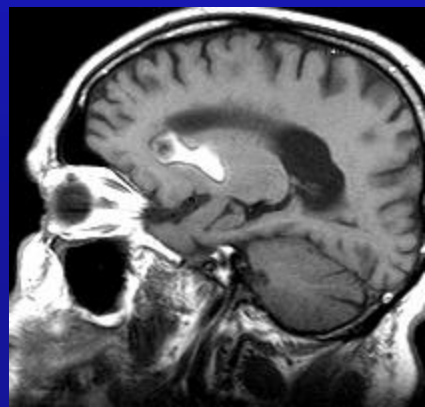
- intraparenchymové
  - traumatické
    - hemoragická kontuze
    - penetrující (střelná) poranění
  - hypertonické
  - do cévní malformace
  - do tumoru

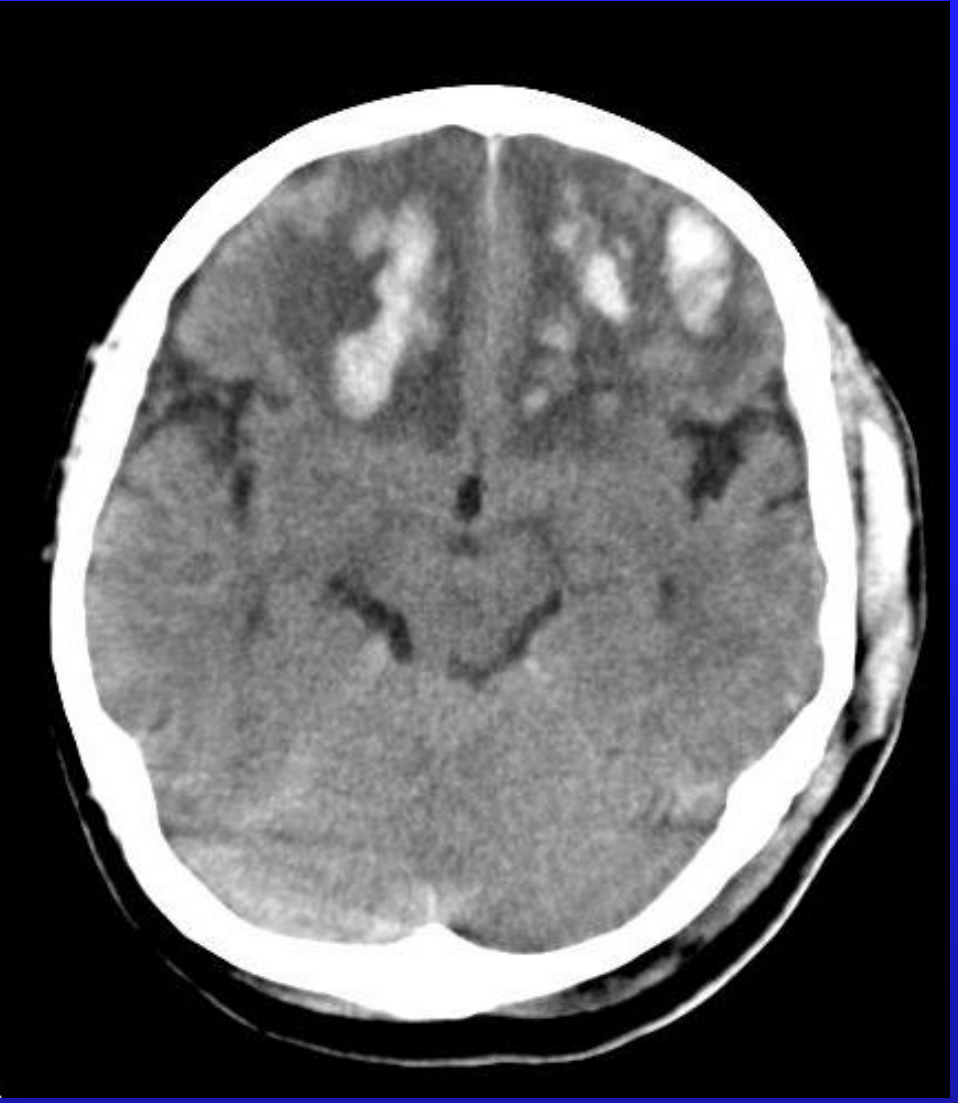






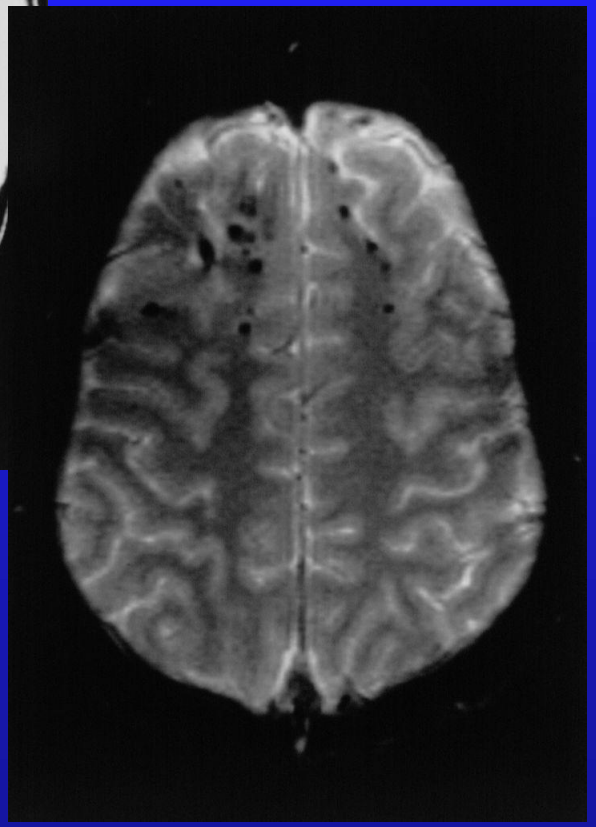


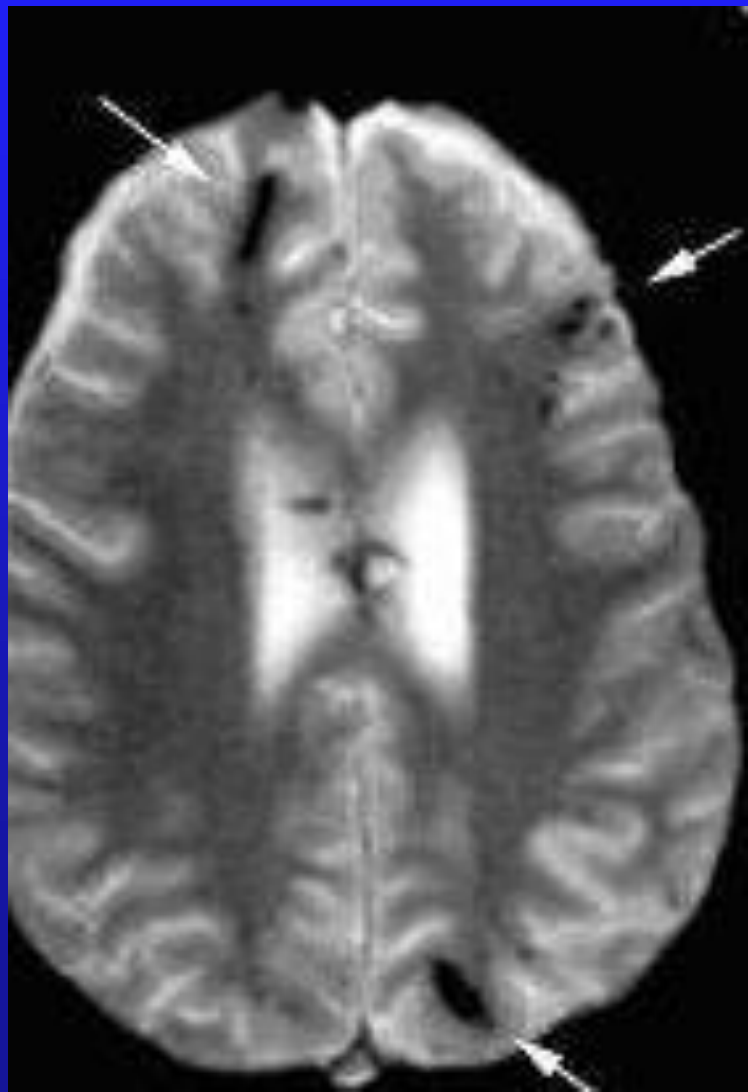




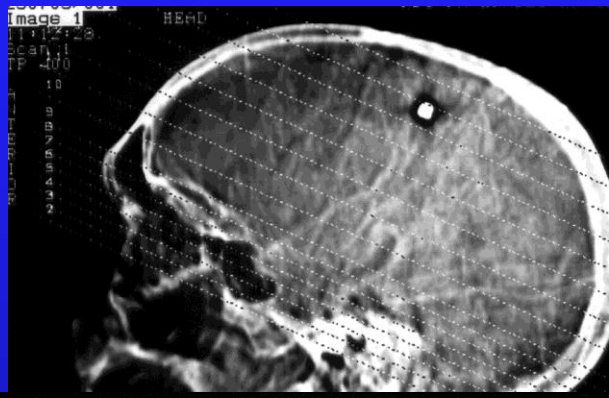
Difůzní axonální poranění (DAI)

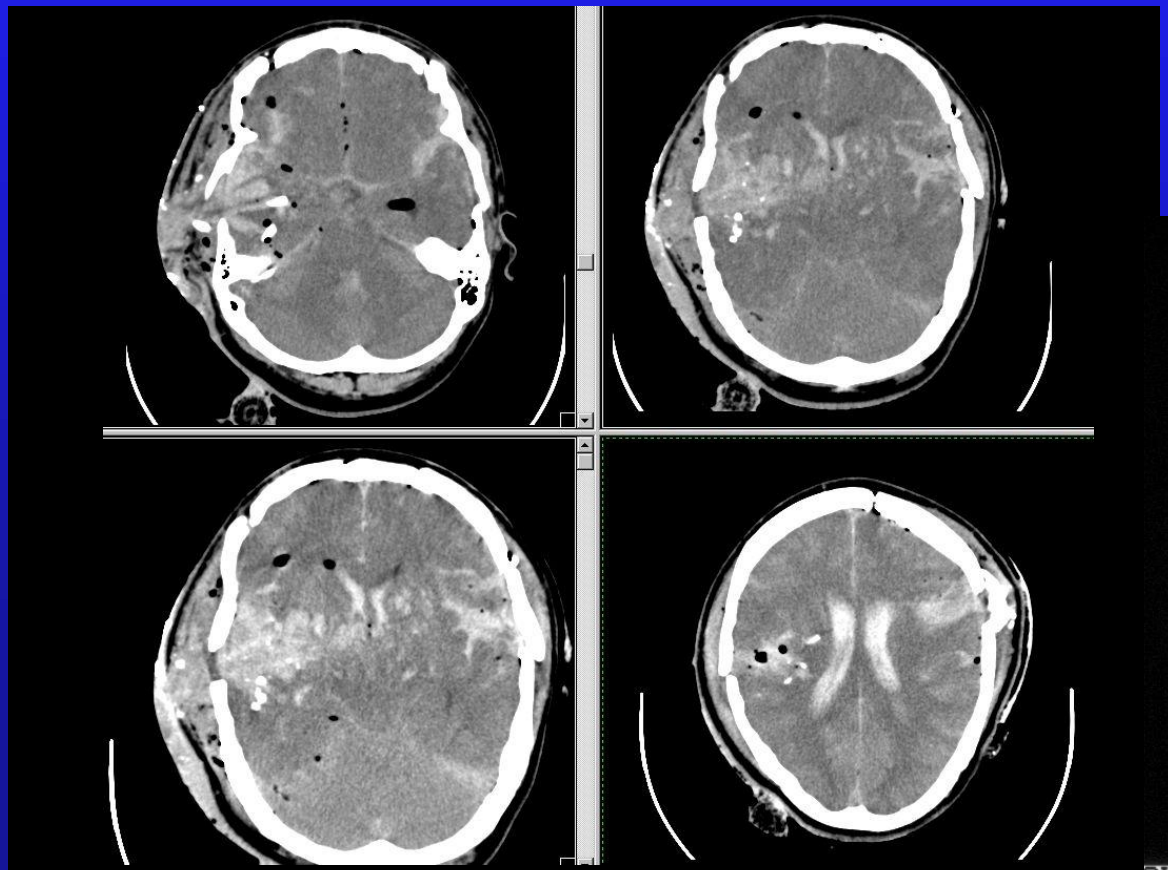
- nereversibilní chirurgicky neřešitelné poranění
- lepší MR – největší sensitivita je v prvních 3-7 dnech, T2, GE
- postižení v oblasti subkortikální, splenium kalózního tělesa, ncl. lentiformis

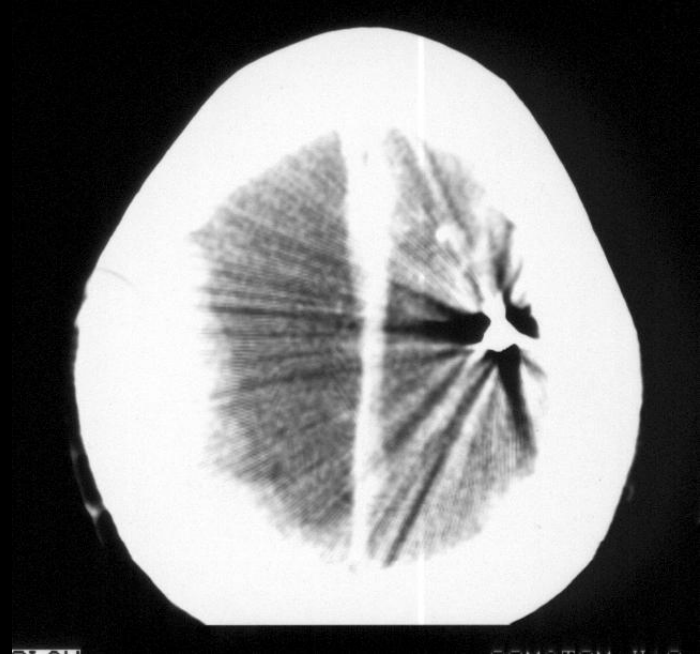


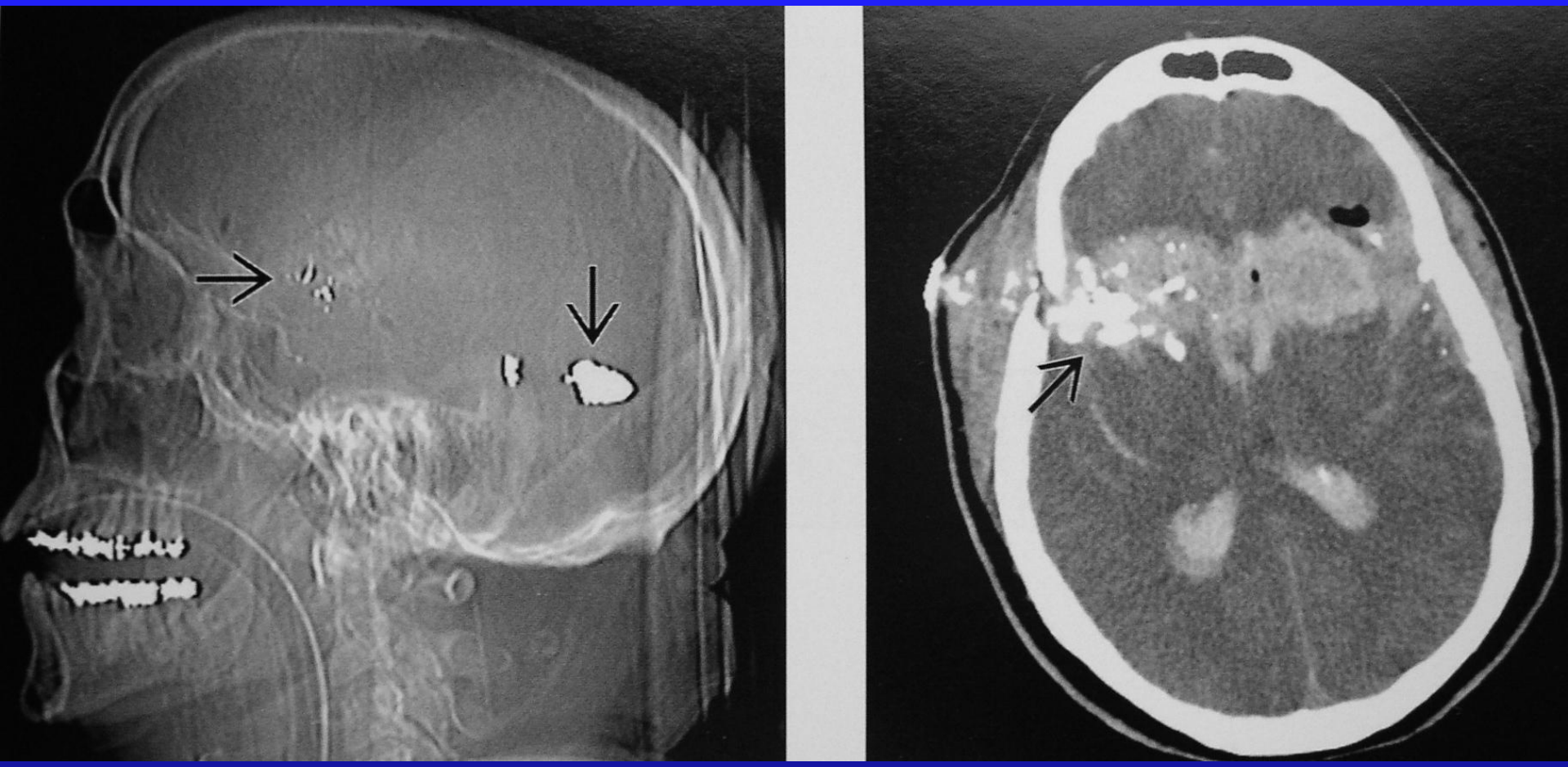


Střelná poranění
- průstřel
- zástřel
- tečná poranění



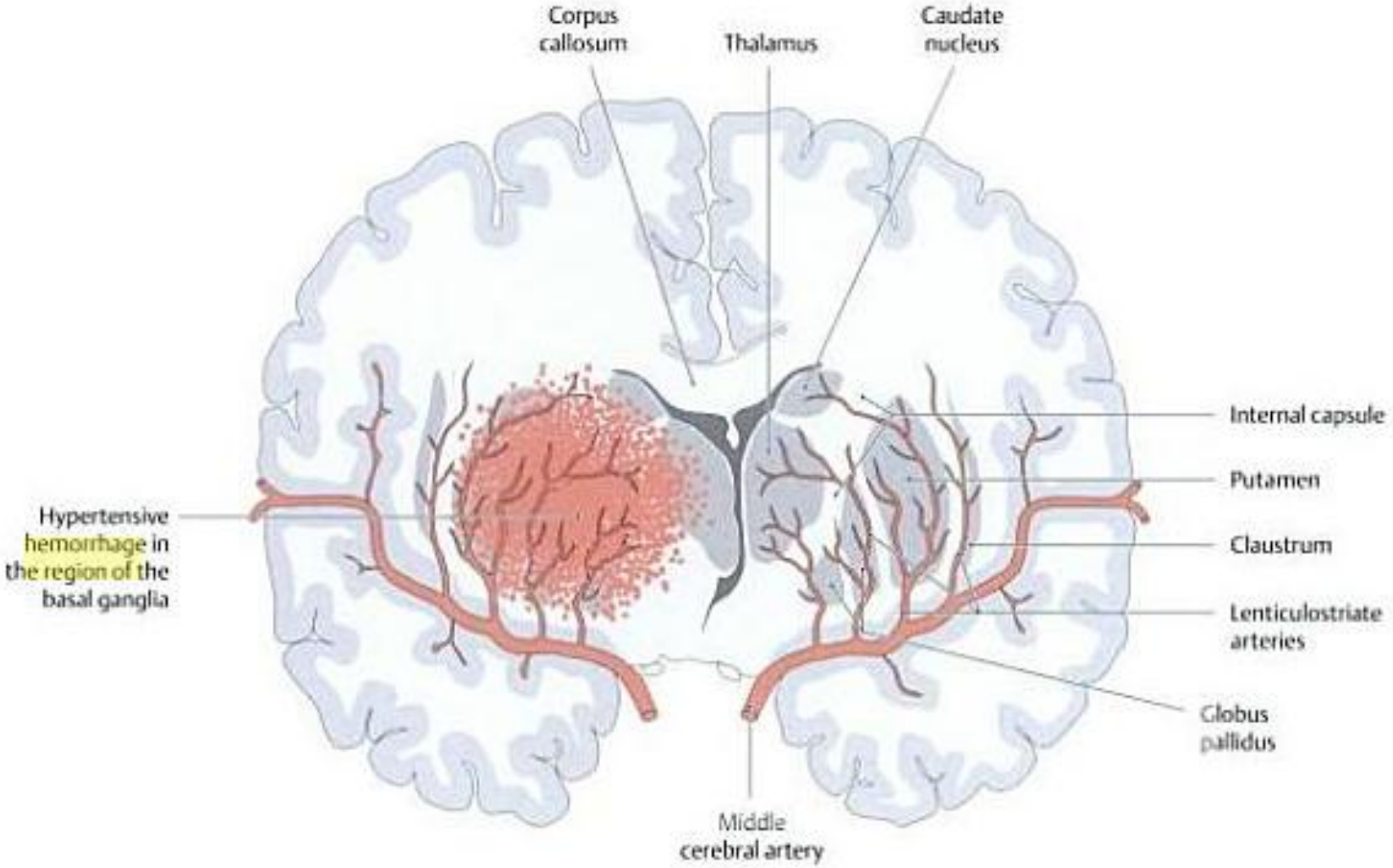






Netraumatické krvácení

- V klasické „hypertonické“ pozici x atypické
  - (latero nebo mediokapsulární)
- Atypické – krvácení do tumoru, AVM, kavernomu, z aneurysmatu
- SA krvácení – hledání zdroje - CTAG, MRAG, DSA


Corpus callosum
Thalamus
Caudate nucleus
Internal capsule
Putamen
Claustrum
Lenticulostriate arteries
Globus pallidus
Hypertensive hemorrhage in the region of the basal ganglia
Middle cerebral artery

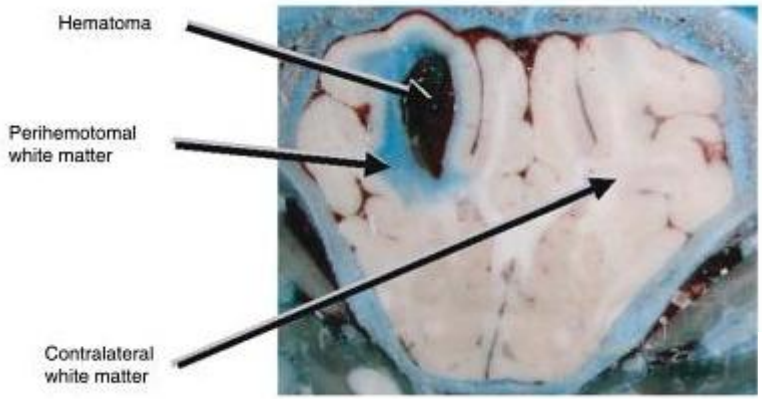


TABLE 2-11. PREDICTORS OF POOR OUTCOME FOLLOWING HEMORRHAGIC STROKE

Clinical
Decreased level of consciousness
Major focal neurological impairments
Cause
Bleeding diathesis
Amyloid angiopathy
Ruptured aneurysm
Epidemiological features
Advanced age
Comorbid diseases
Hyponatremia
Baseline brain imaging findings
Deep hemispheric hematoma
Brain stem hematoma
Hematoma > 2.5 cm in diameter
Intraventricular hemorrhage
Extensive subarachnoid hemorrhage
Acute hydrocephalus

▶ TABLE 2-13. GLASGOW COMA SCALE

Best eye-opening response	
4	Eyes open spontaneously, not necessarily aware of environment
3	Eyes open to speech, not necessarily in response to command
2	Eyes open in response to painful stimulus
1	No eye opening in response to painful stimulus
Best motor response	
6	Follows simple commands, can have paresis or hemiplegia
5	Responds to painful stimulus by attempting to remove source of pain
4	Withdraws to painful stimulus
3	Develops abnormal flexor (decorticate) posturing in response to painful stimulus
2	Develops abnormal extensor (decerebrate) posturing in response to painful stimulus
1	No motor response to painful stimulus
Best verbal response	
5	Patient oriented to time, place, and person
4	Patient confused but responds to conversation
3	Language is intelligible and no sustained sentence
2	Has incomprehensible sounds, moans, and groans—no words
1	No verbal response

▶ TABLE 2-12. WORLD FEDERATION OF NEUROLOGICAL SURGEONS' RATING SCALE

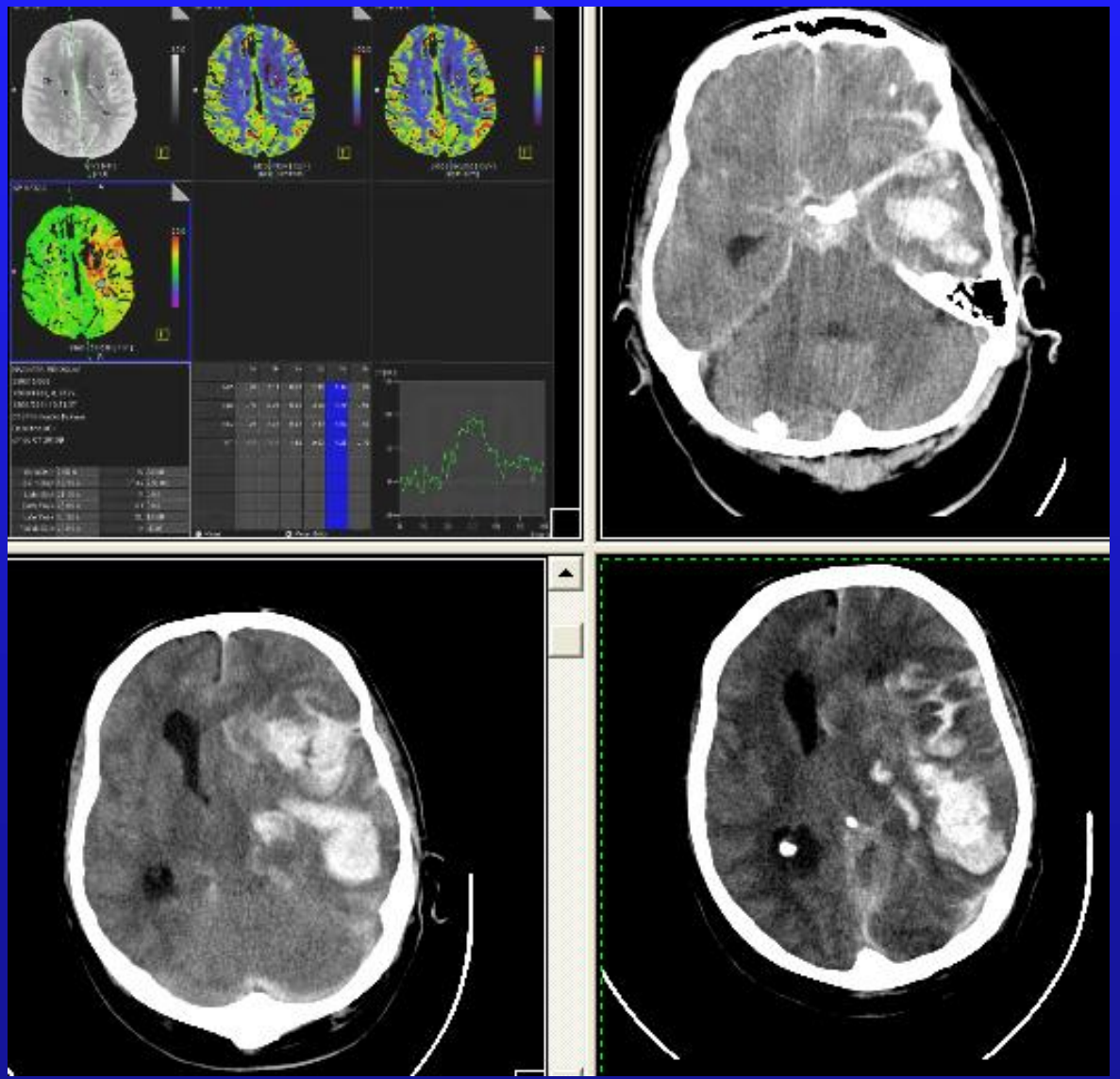
Grade	Glasgow Score	Focal Signs
I	15	Absent
II	13–14	Absent
III	13–14	Present
IV	7–12	Present/absent
V	3–6	Present/absent

Adapted from Ogungbo.[129]

Krvácení jako komplikace operace:

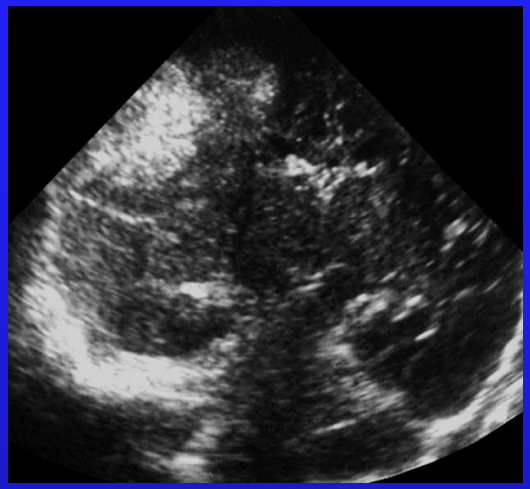
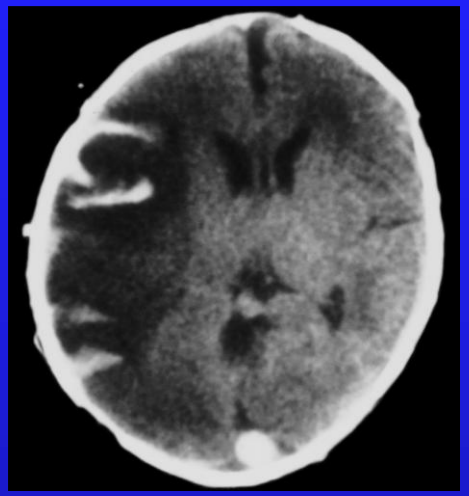
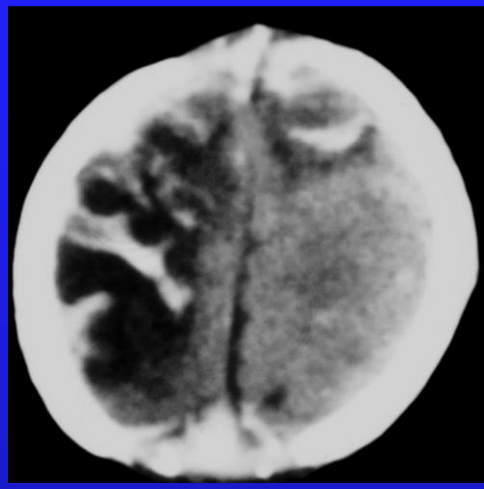
- Krvácení do operačního pole
- Extracerebrální krvácení

Krvácení do ischemické tkáně

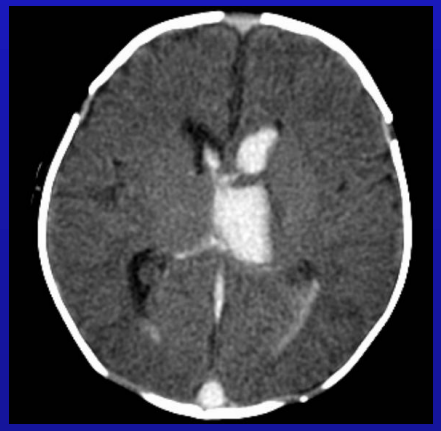


Venostatické hemorhagické infarkty

- kojenec, 5 týdnů, deficit antitrombinu III

- kojenec, 2 měs., sepse



Závěrem:

- Detekce krvácení
- Akutní stav – operace?
- Typ: extra vs. intracerebrální
- Etiologie
- Další vyšetření – CTAG? DSA?
- Grading