

INTRAKRANIAALNE HÜPOTENSIOON

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INTRAKRANIAALNE HÜPOTENSIOON E. KRANIOSPINAALNE HÜPOTENSIOON

- Liikvori rõhu langus < 4 mmHg e. < 6 cmH₂O (norm lamaval täiskasvanul 7-15 mmHg)
- Sobiva kliinilise sümptomaatikaga patsiendil (nt ortostaatiline peavalu)
- Harv, healoomuline ning tihti ise-limiteeruv
- Esmane diagnoos on vale 56% juhtudest
- Kaebuste algusest kuni diagnoosimiseni kulub keskmiselt 13 kuud

PRIMAARNE E. SPONTAANNE

- Liikvori leke seljaosas
- Duurakoti nõrkus ning triviaalne trauma
- Seotud sidekoehaigustega nagu Marfan, Ehlers-Danlos sündroomid

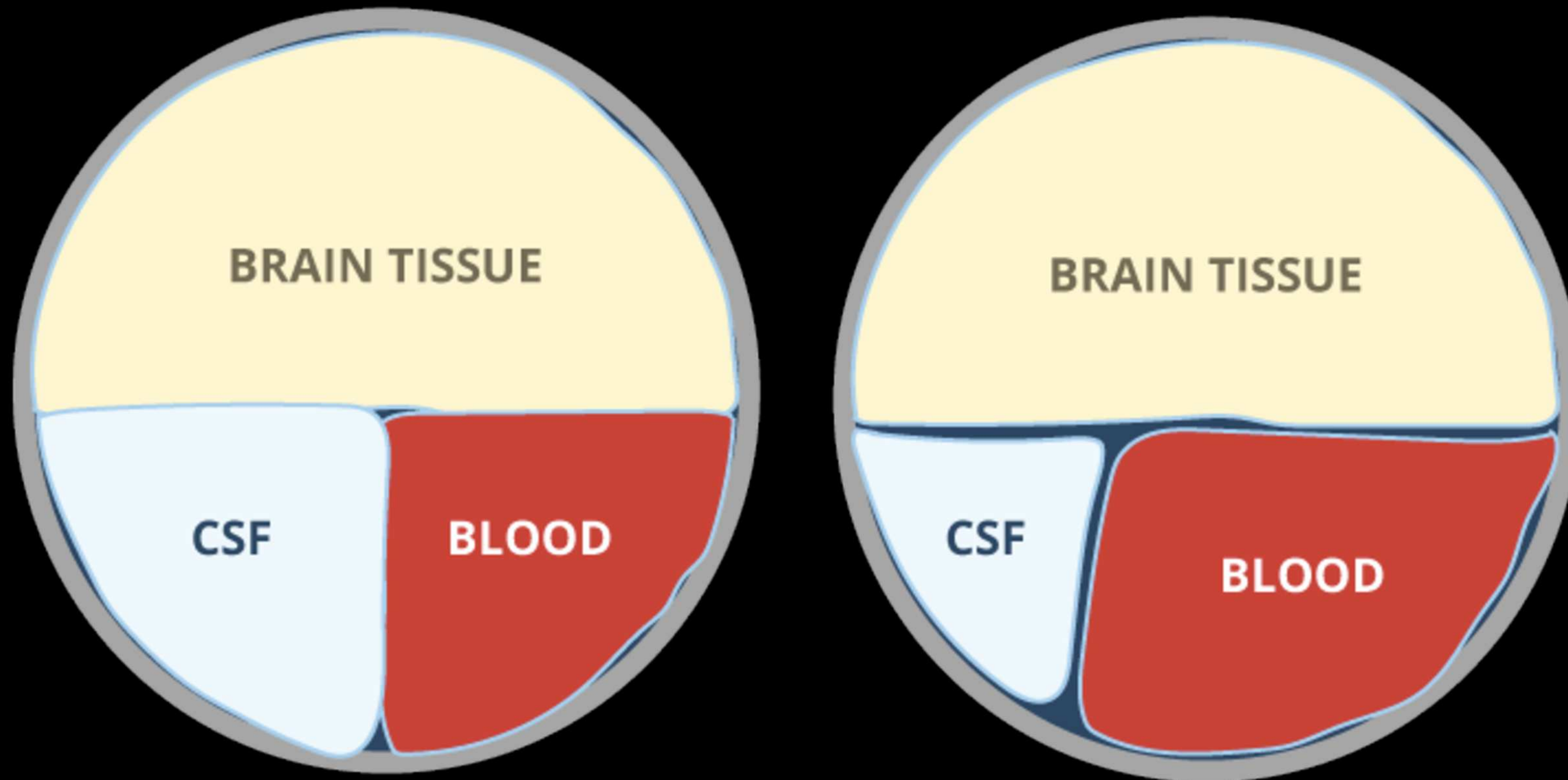
SEKUNDAARNE E. IATROGEENNE/ TRAUMAATILINE

- Lumbaalpunktsioon
- Ülešunteerimine
- Kirurgia
- Spinaalanesteesia
- Trauma

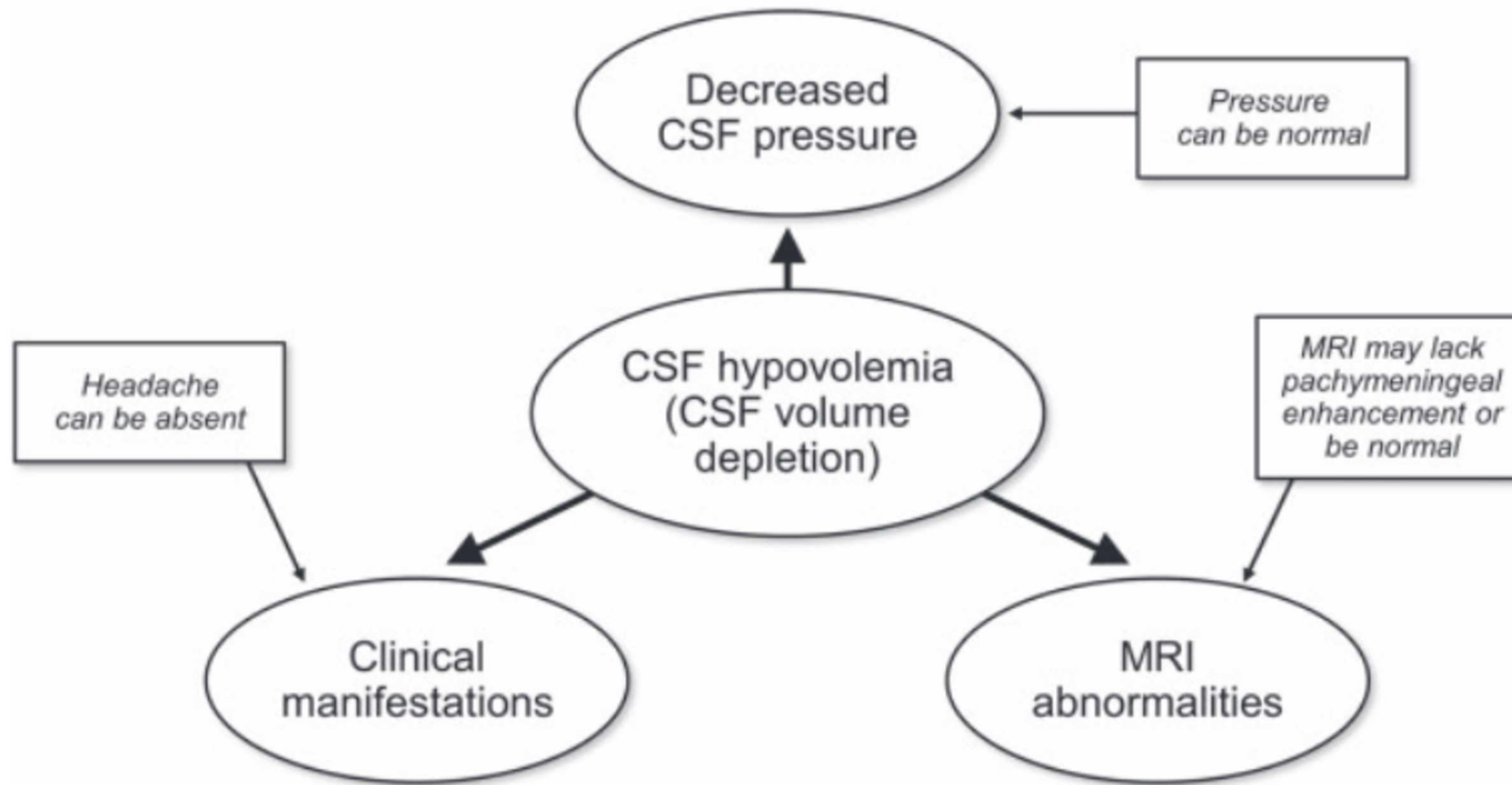
EPIDEMIOLOGIA (Spontaanne intrakraniaalne hüpotensioon)

- Haigestumine aastas 5/100 000
- Noored ja keskealised täiskasvanud
- N:M 2:1

MONRO-KELLIE DOKTRIIN



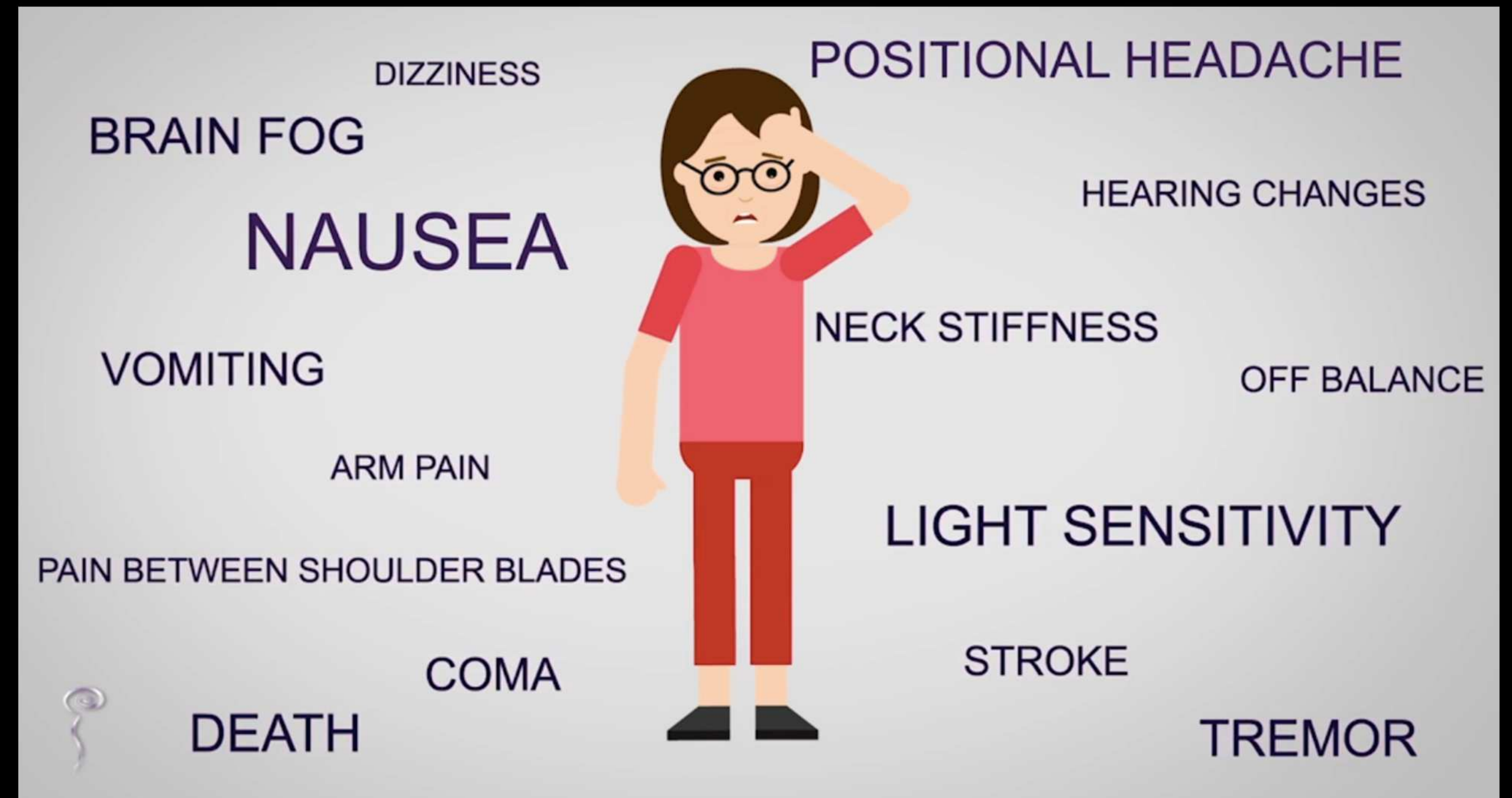
The Concept of CSF Hypovolemia



Kõigil patsientidel ei esine liikvorirõhu langust —> õige termin oleks HÜPOVOLEEMIA

KLIINIK

- Ortostaatiline peavalu (tugevneb püstiasendis, köhides, naerdes, Valsalva manöövril)
- liveldus, oksendamine
- Kraniaalnärvide haaratusest tingitud sümptomid
 - Kuulmislangus, tinnitus, pearinglus, isutus, fotofoobia, diploopia, nägemisvälja defektid, miimiliste lihaste nõrkus, näonaha tuimus
- Hüperprolaktineemia 24%



Kõigi ortostaatiliste peavalude põhjuseks ei ole intrakraniaalne hüpotensioon ning kõik peavalud intrakraniaalse hüpotensiooni korral ei ole ortostaatilised!

DIAGNOOSIMINE

International Classification of Headache Disorders (ICHD) diagnostic criteria for SIH [[60](#)]

- A. Any headache fulfilling Criterion B
 - B. Headache has developed in temporal relation to low CSF pressure or CSF leakage, or has led to its discovery
 - C. Low CSF pressure (<6 cm H₂O) and/OR evidence of CSF leakage on imaging
 - D. Not better accounted for by another ICHD-3 Diagnosis
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Madala liikvorirõhu puudumine ei välista tegelikult nn intrakraniaalse hüpotensiooni sündroomi esinemist!

RADIOLOOGI ROLL

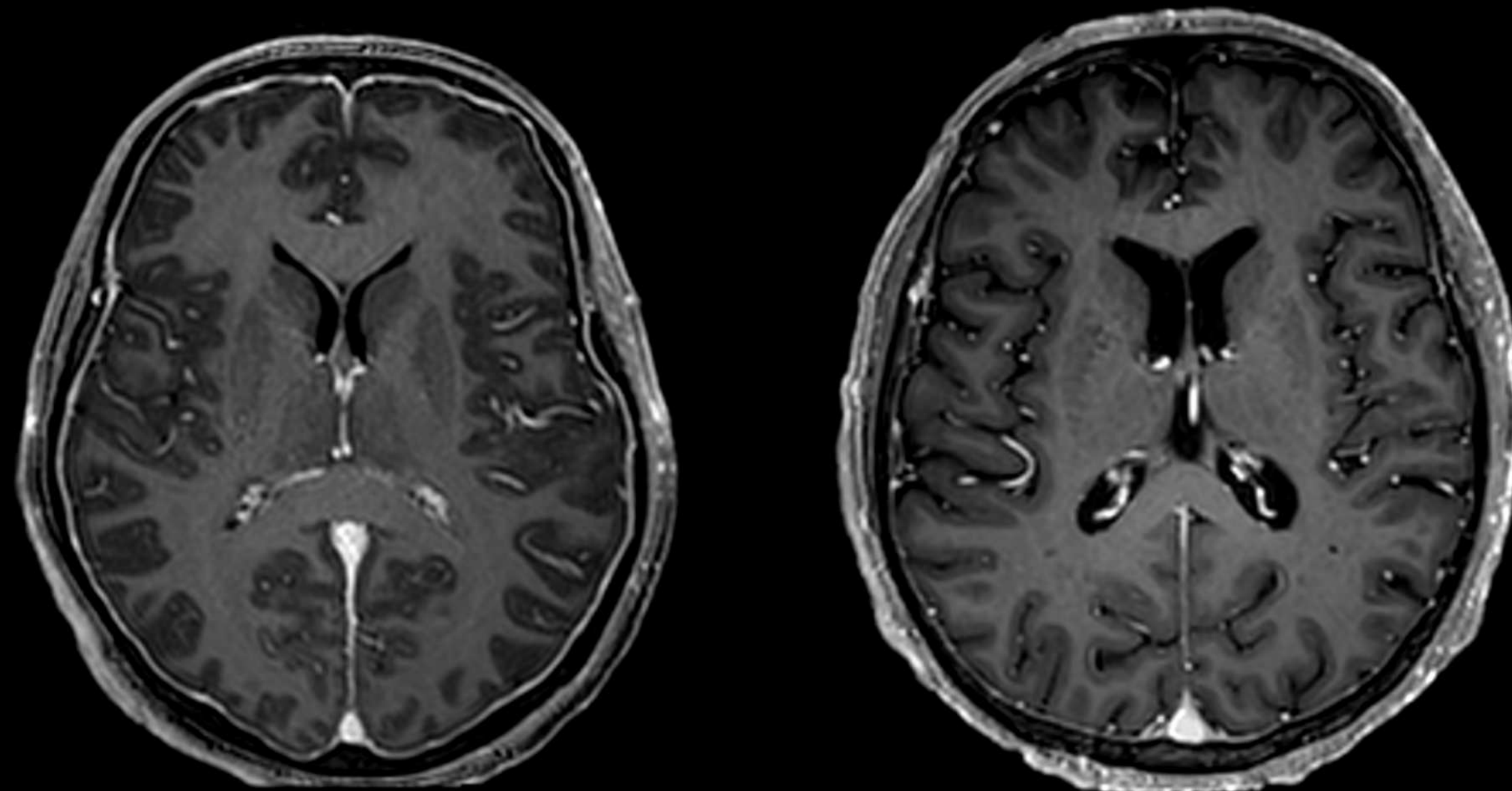
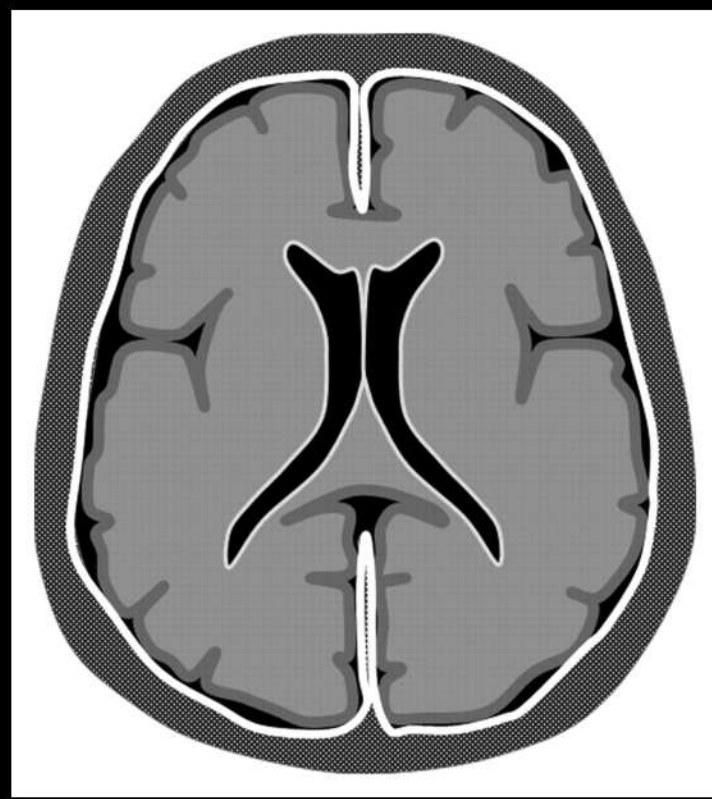
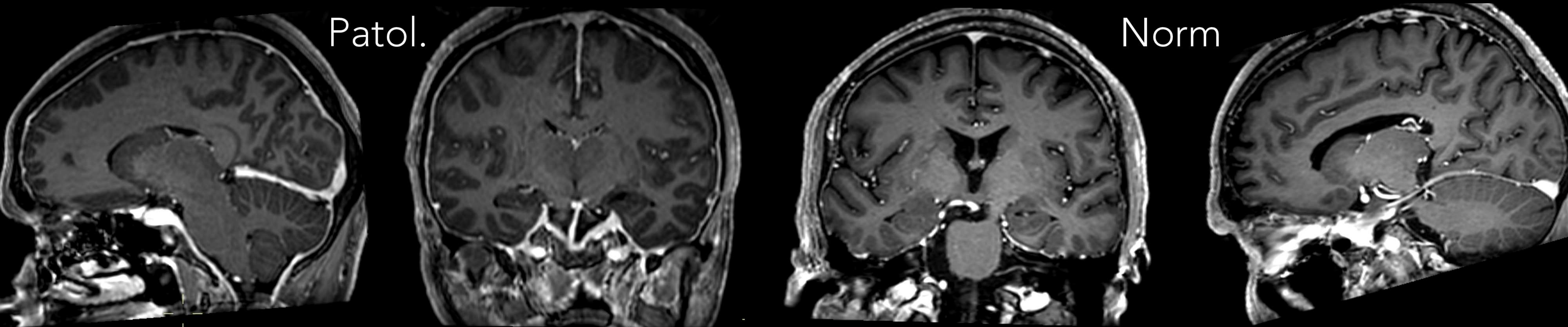
1. Kahtlustada ja ära tunda intrakraniaalse hüpotensiooni tunnused

- Peaaju MRT

2. Lokaliseerida liikvori lekke koht

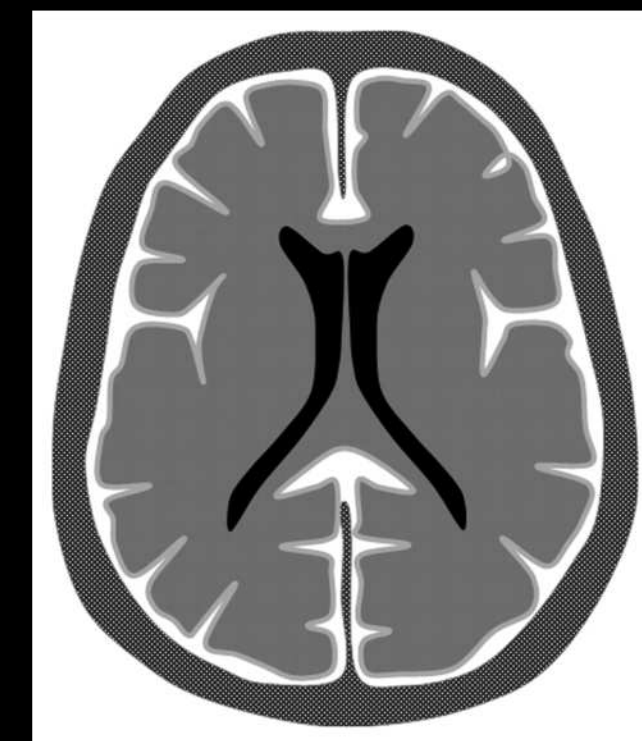
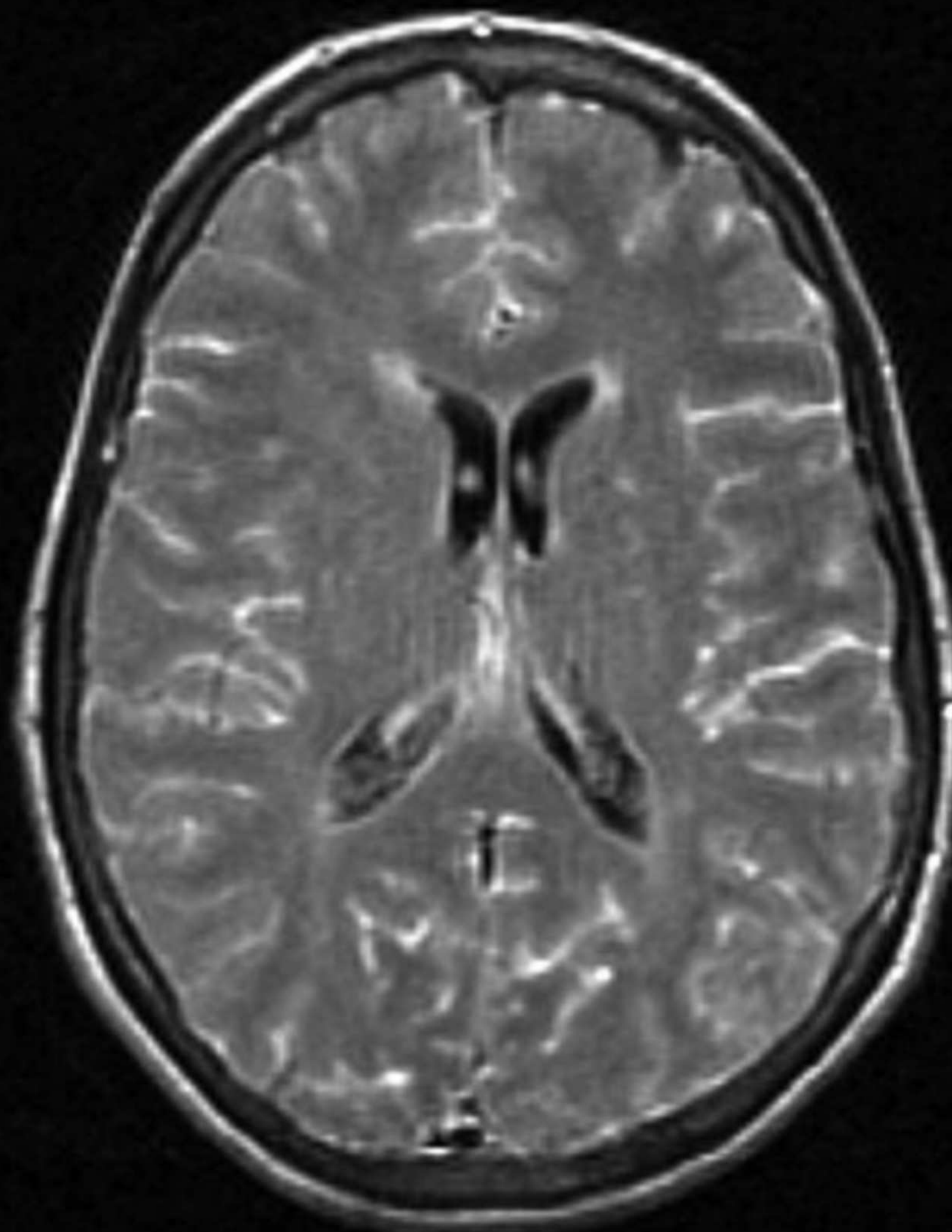
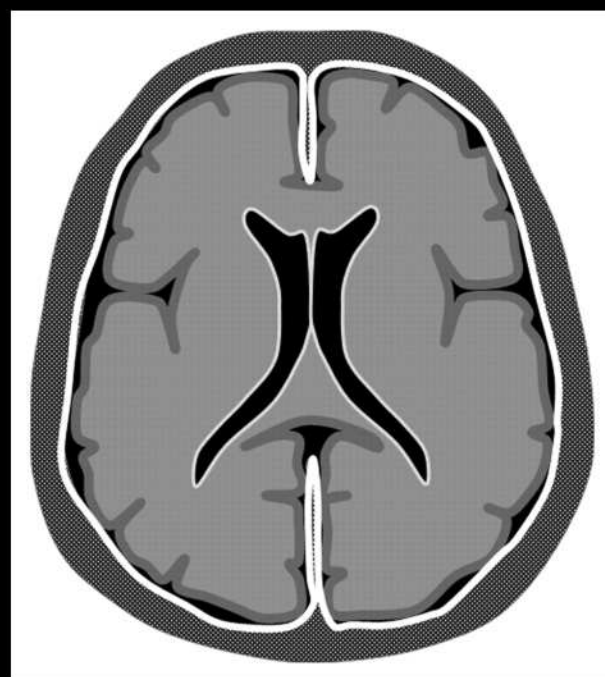
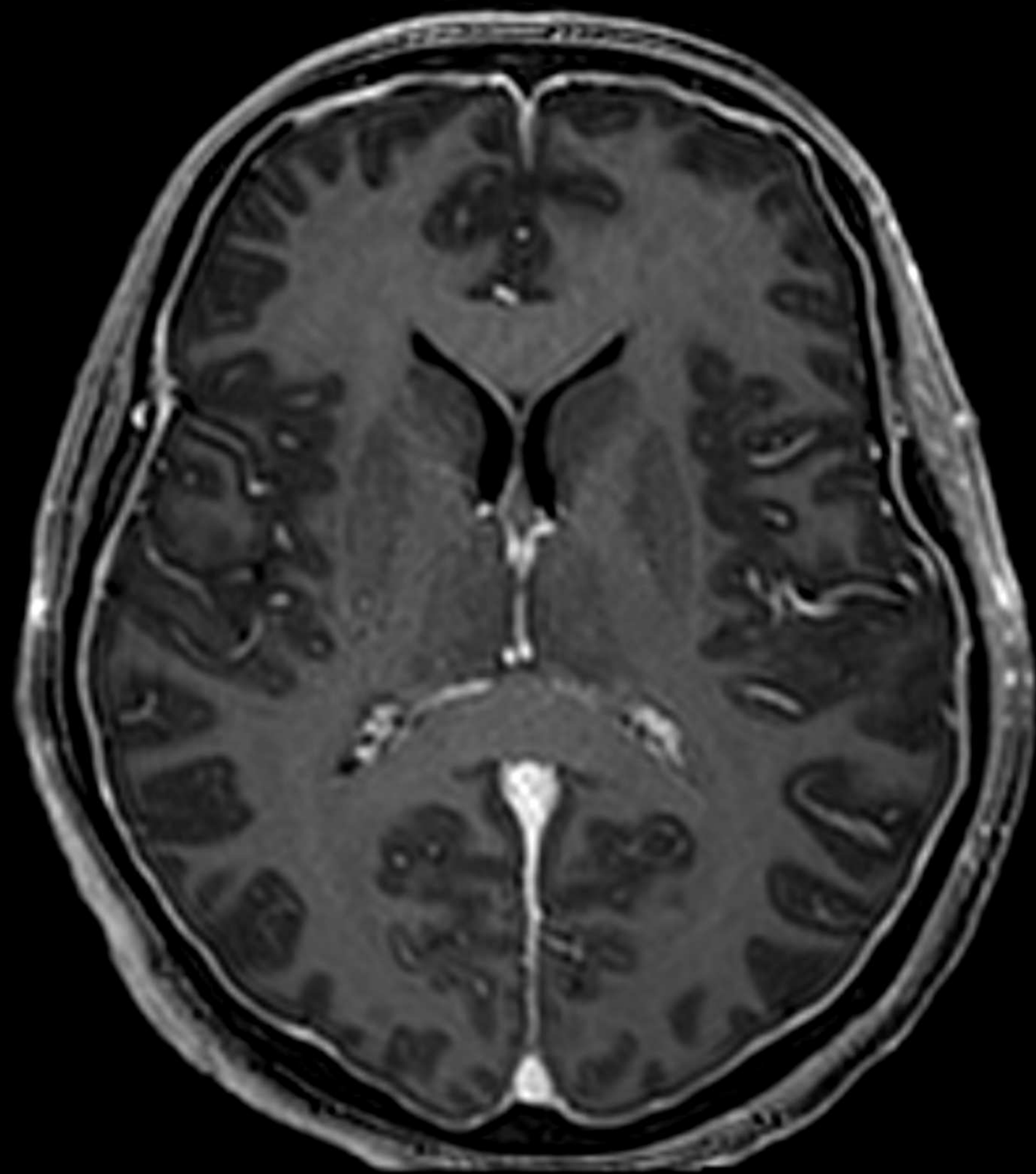
- KT müelograafia
- MRT müelograafia
- DSA müelograafia

1. MRI difuusne pahhümeningeaalne kontrasteerumine 83%

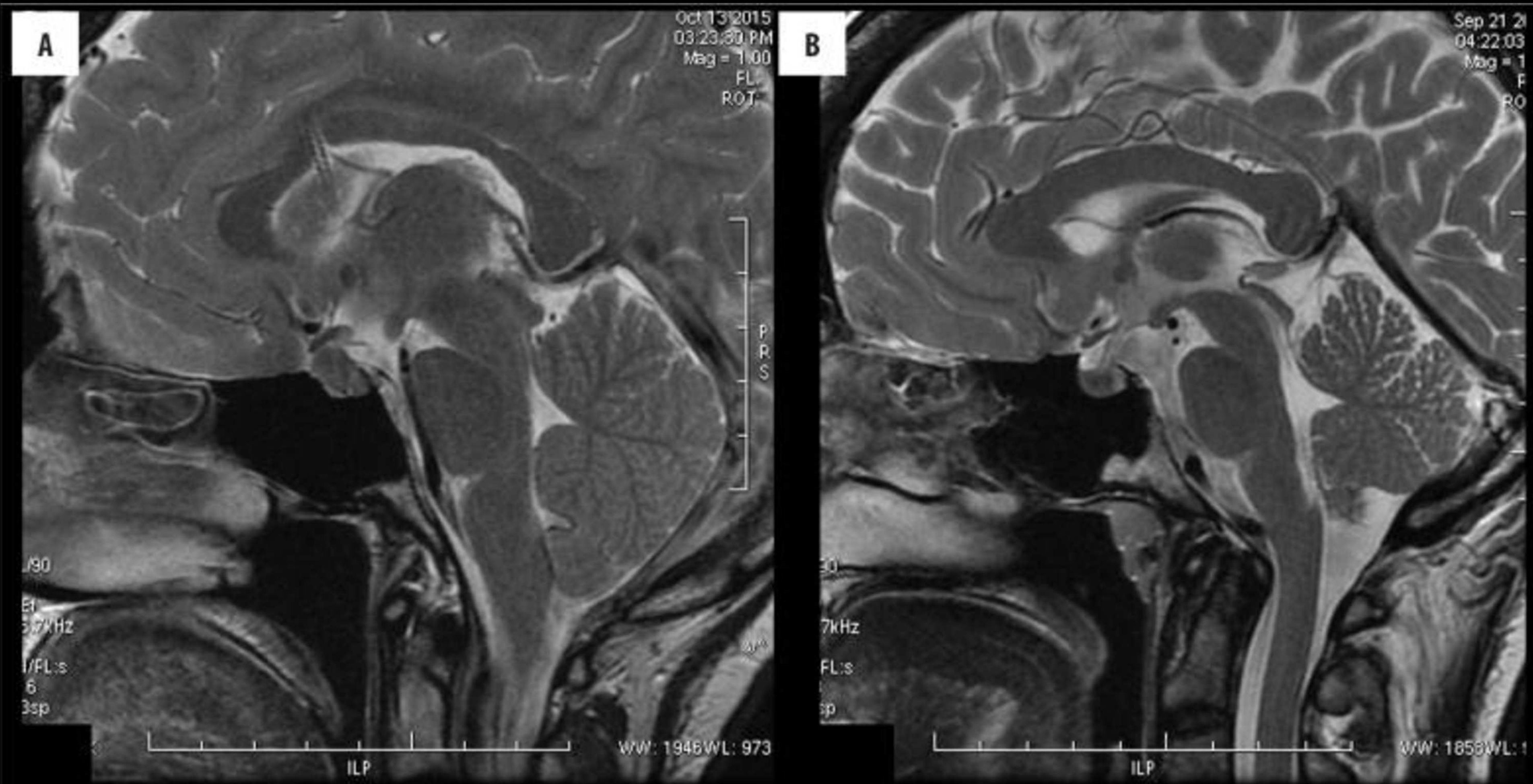


Võib puududa kroonilises faasis!

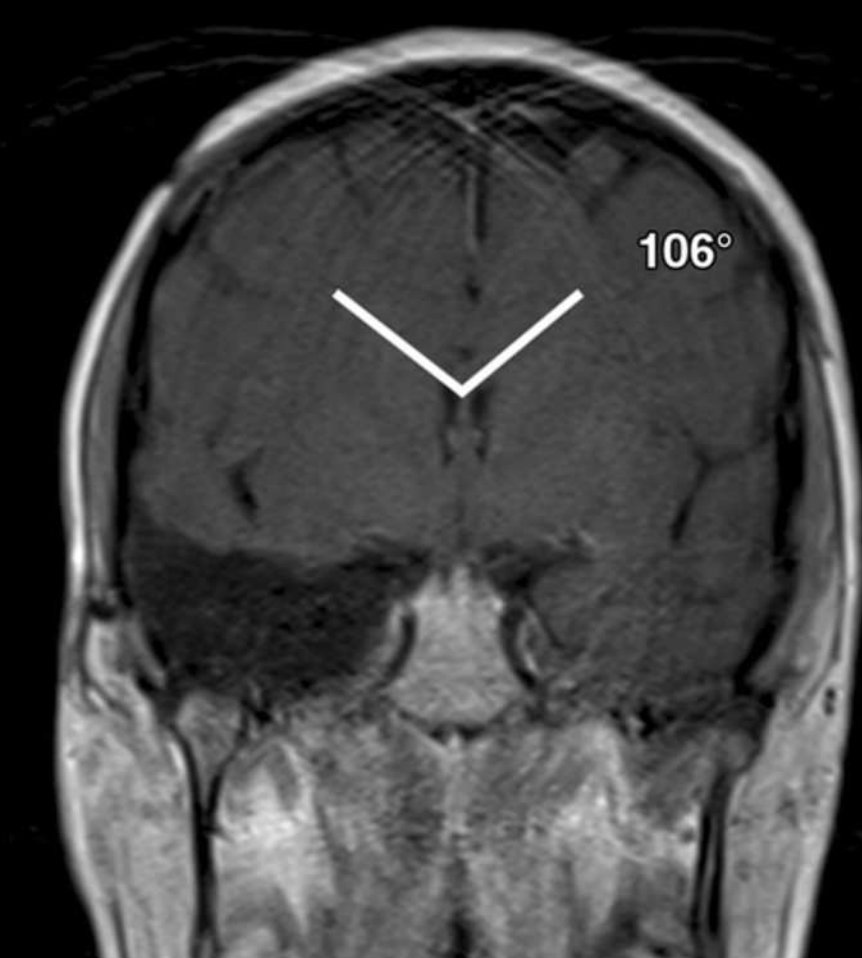
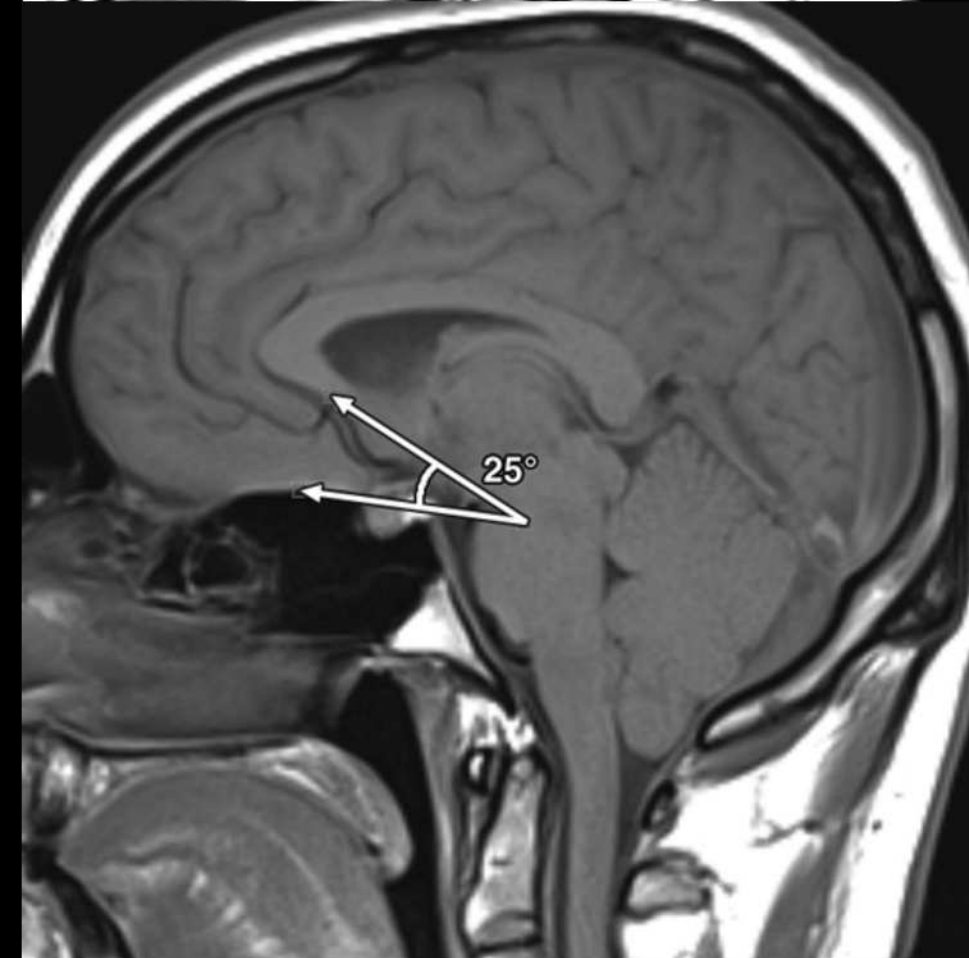
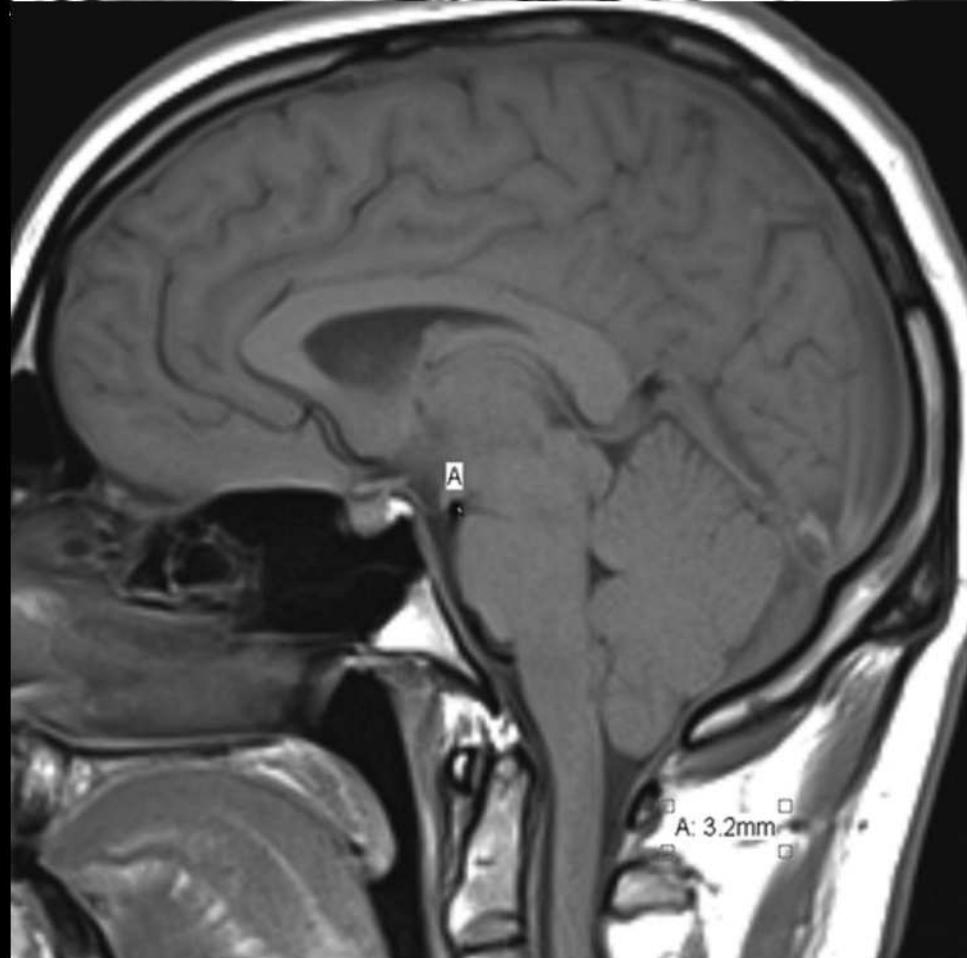
Pahhümeningeaalne vs leptomeningeaalne kontrasteerumine



2. Allavajunud peaaju (*brain sagging*) 61%



Brain sagging: kvantitatiivsed tunnused

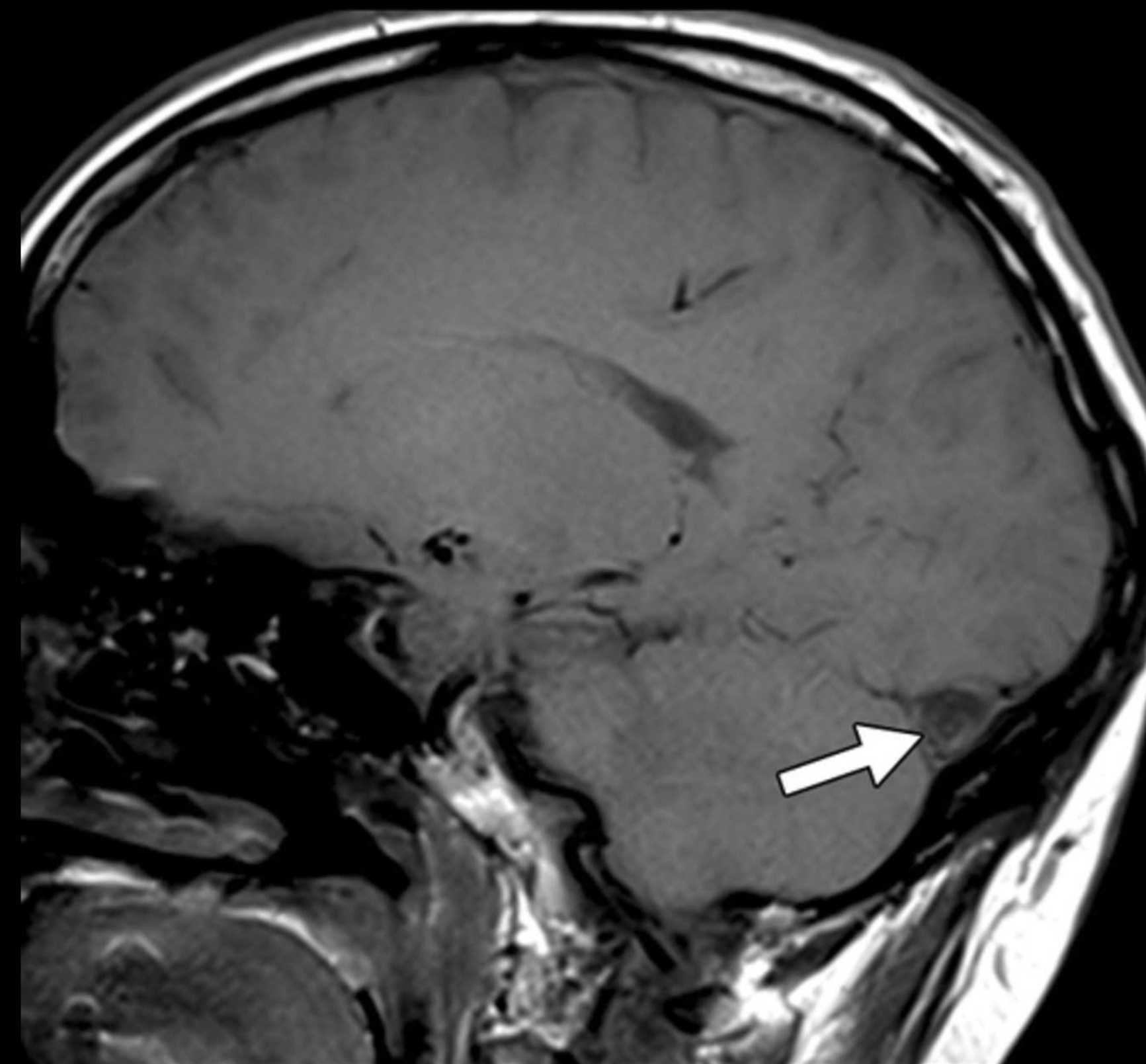
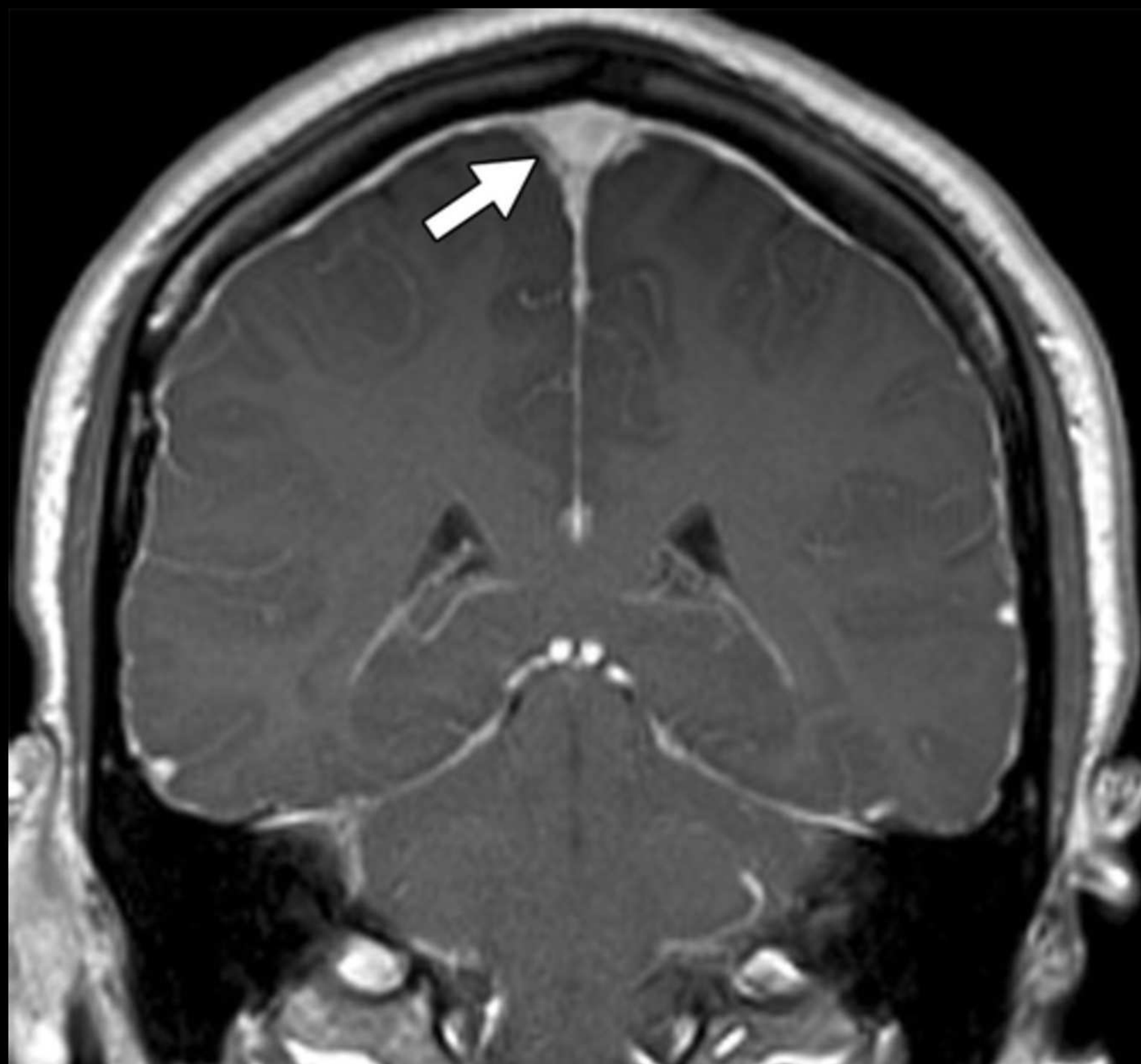


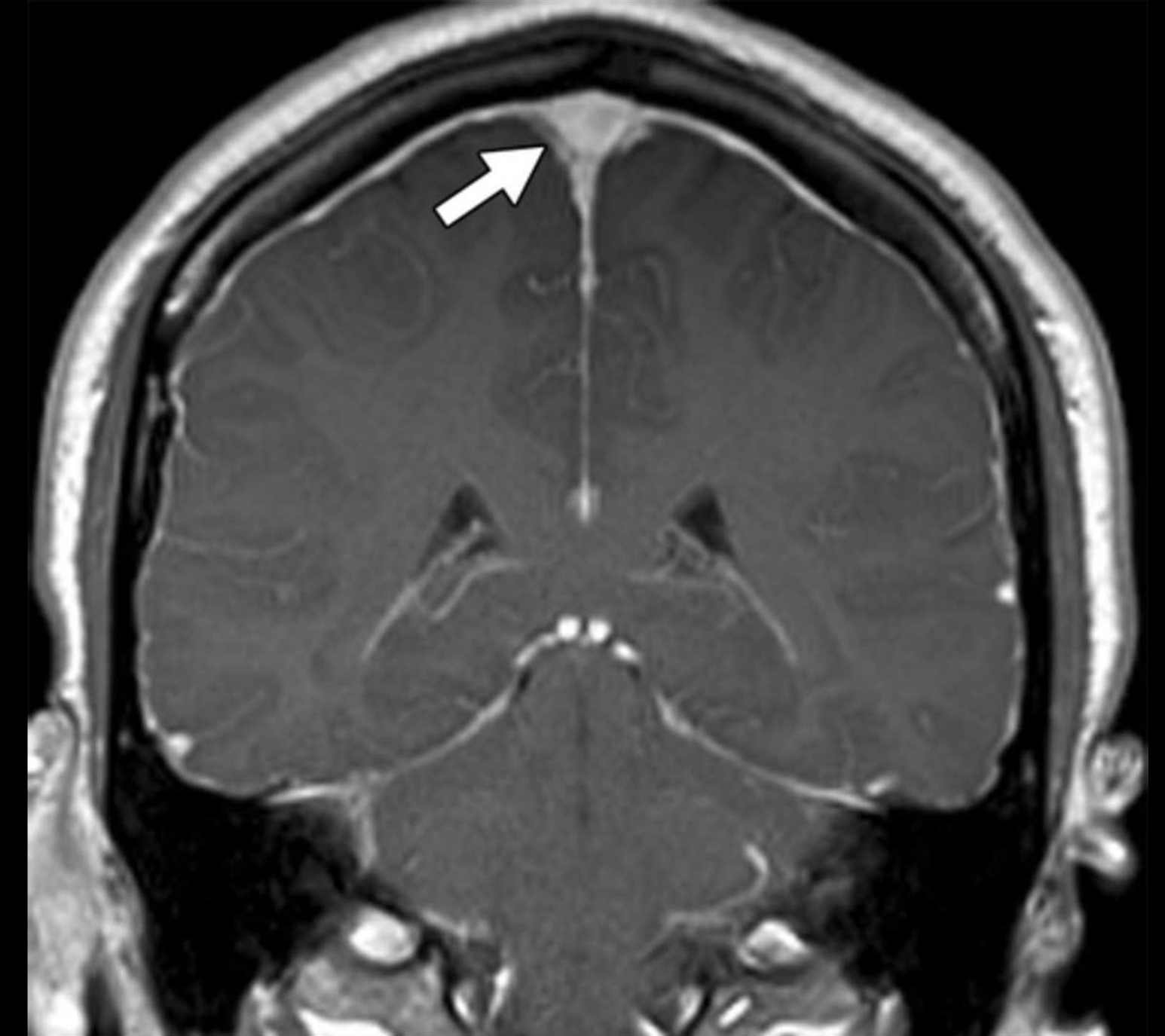
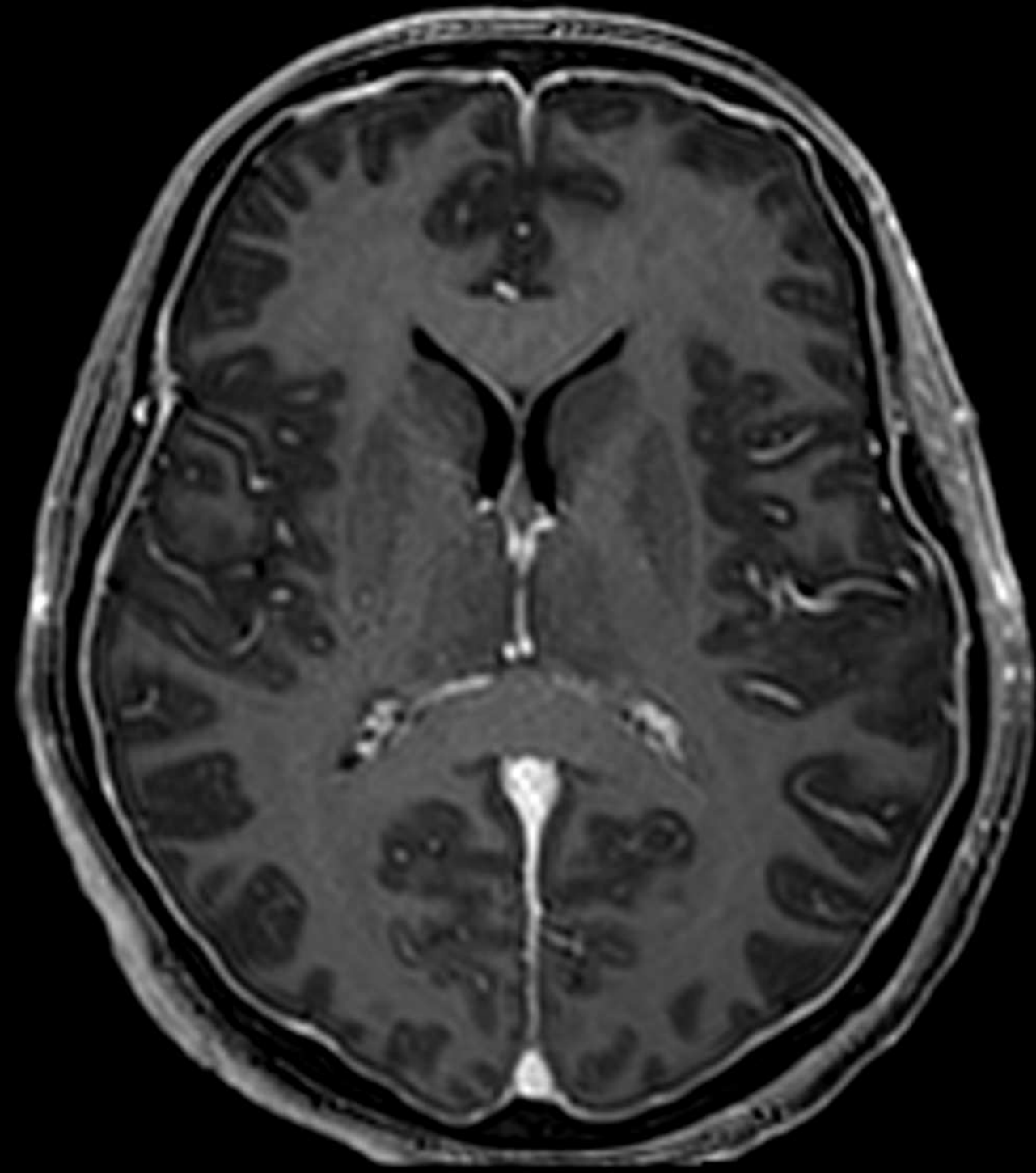
Mamillo-pontine distant $< 5,5$ mm

Pontomesentsefaalnurk $< 50^\circ$

Külgvatsakeste nurk $> 90^\circ$

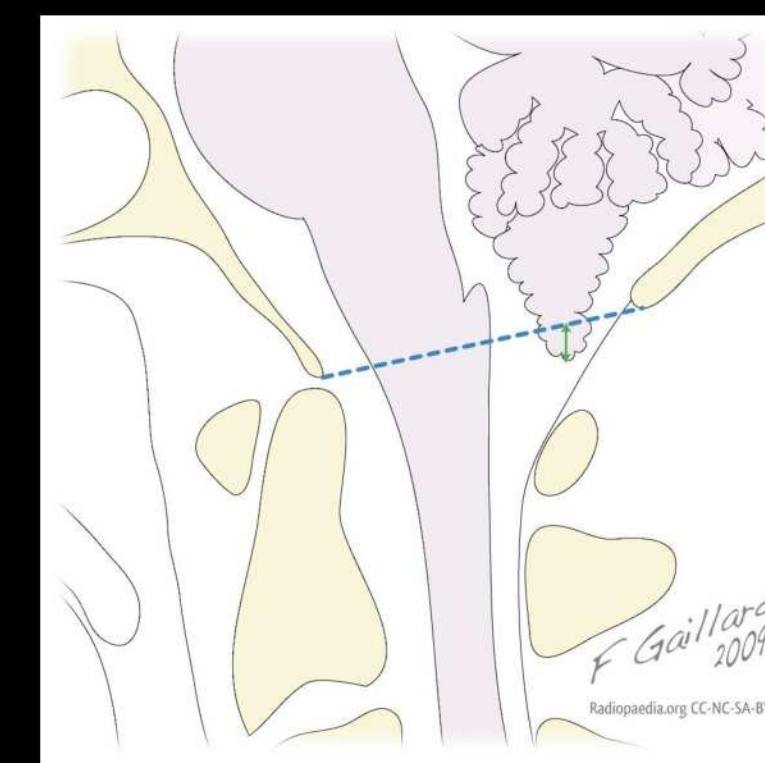
3. Veenide ületäitumine (*venous distention sign*) 75%





93% patsientidest esineb vähemalt 1/3 tunnusest!

4. Väikeaju tonsillaarne ektoopia

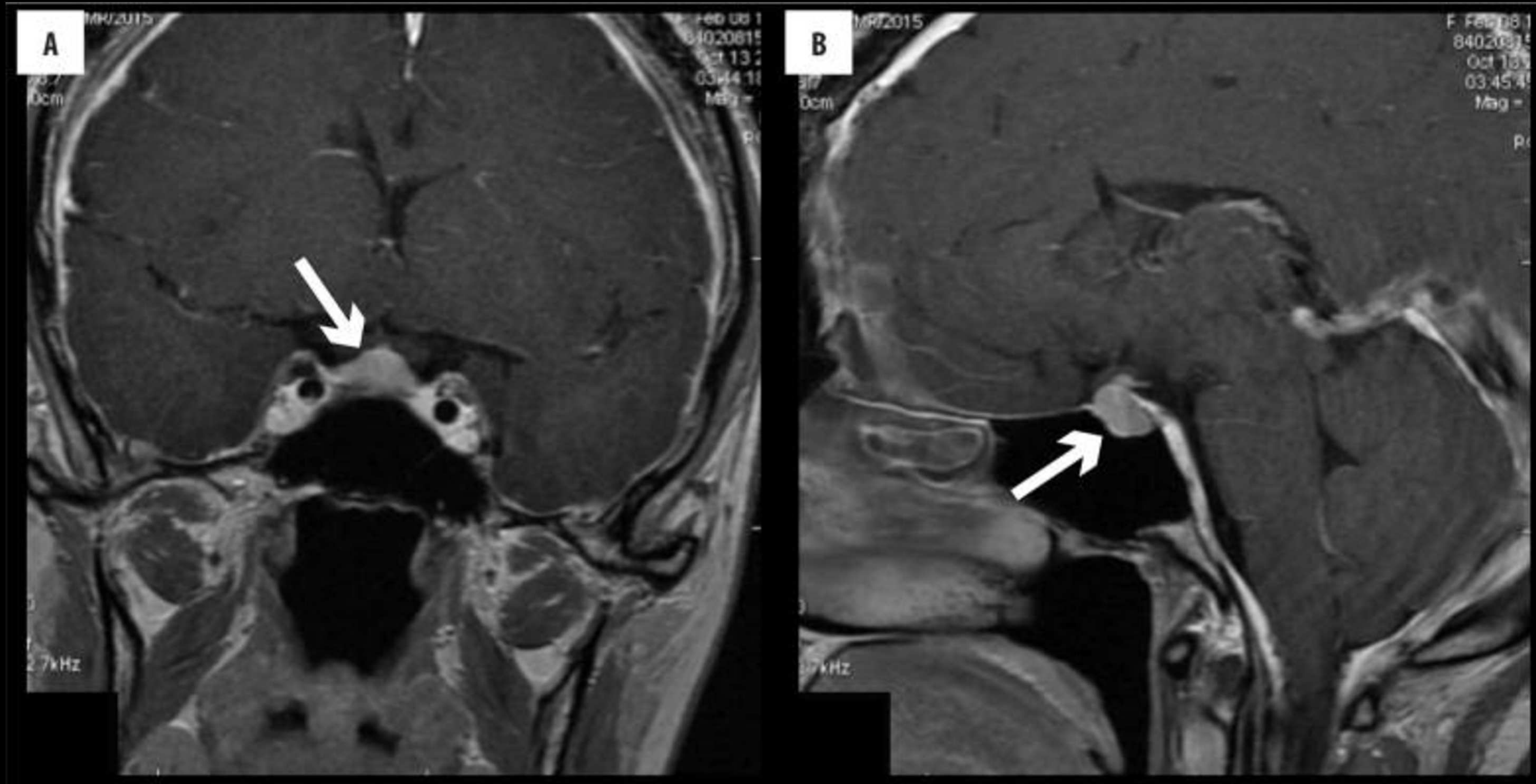


(1) (3)

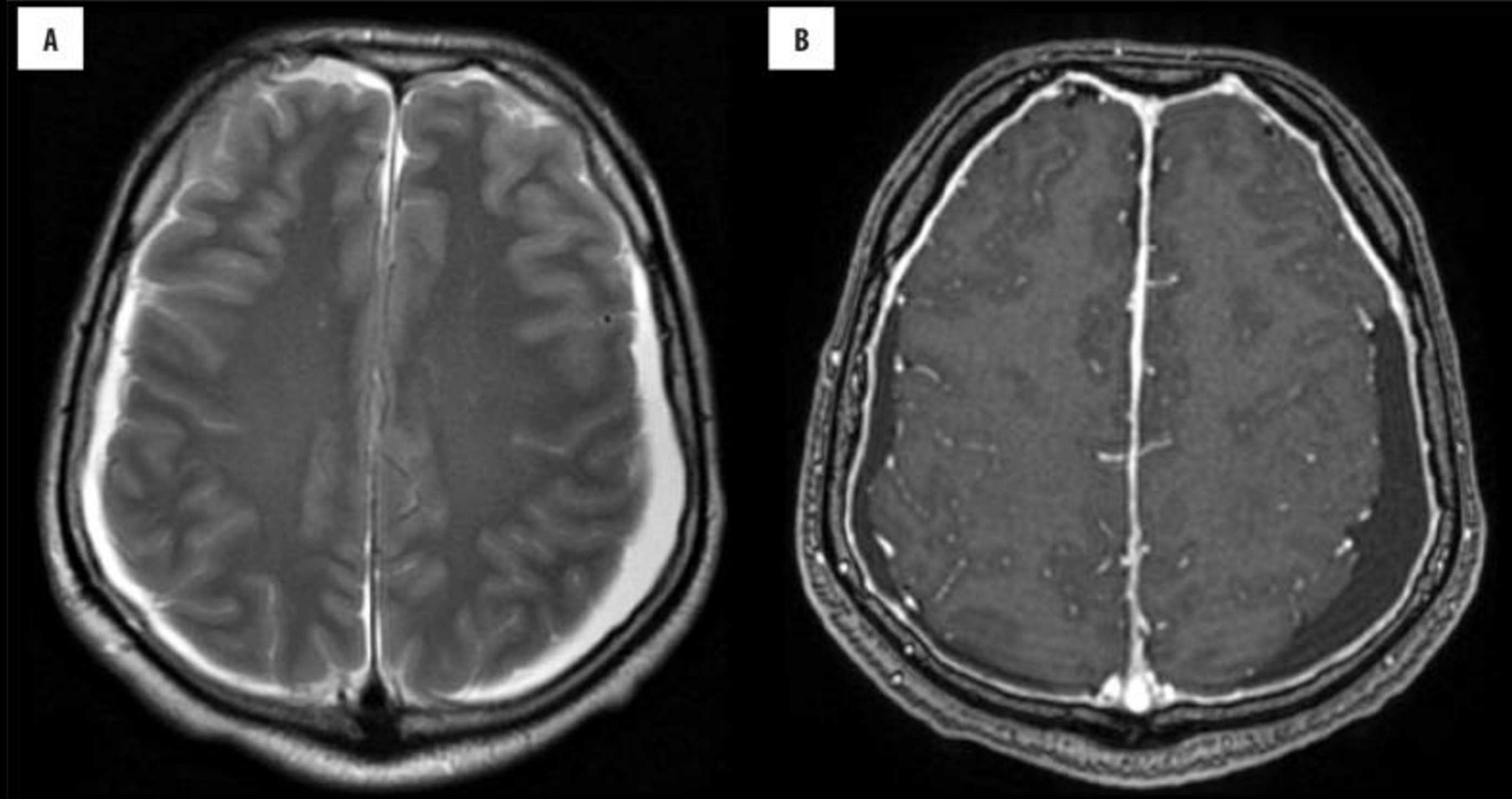
Intrakraniaalne hüpotensioon

Chiari I malformatsioon

5. Pöörduv hüpfüüsi suurenemine



6. Subduraalsed vedelikukogumikud



RAVI

- Mõned patsiendid paranevad spontaanselt
- Konservatiivne ravi:
 - Voodirežiim, piisav vedelikutarbimine, kofeiin & teofülliin, analgeetikumid
- Epiduraalne *blood patch*
 - Võimalusel lekkekoha lähedale
- Kirurgiline ravi
 - Lekke lokaliseerimine!



**Stop
the
brain
drain**

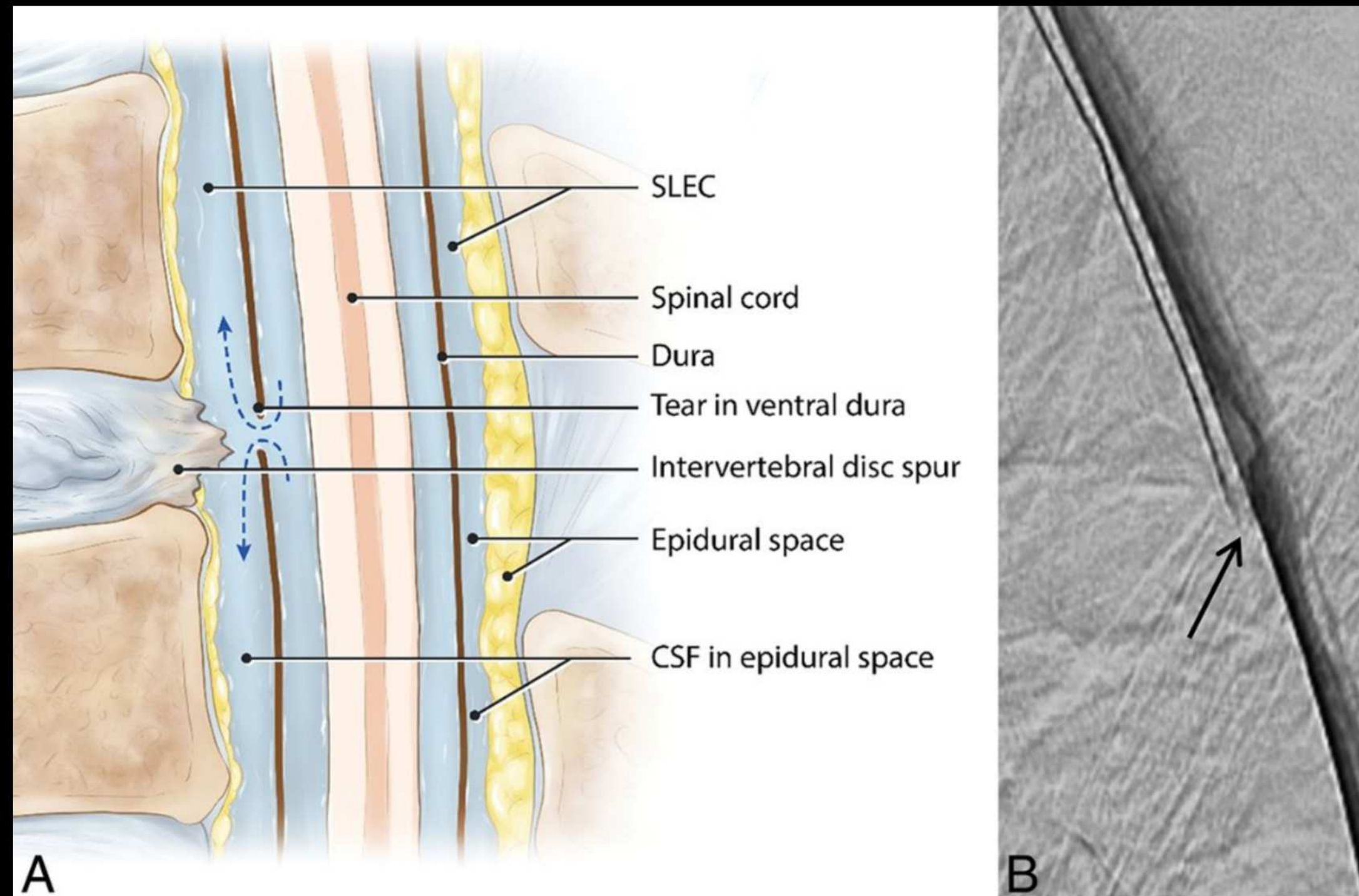
www.csfleak.info

SPONTAANSE INTRAKRANIAALSE HÜPOTENSIOONI PÕHJUSED

- Dura rebenemine 26%
- Meningeaalne divertikkel 42%
- CSF-venoosne fistel 3%
- Teadmata põhjus 29%

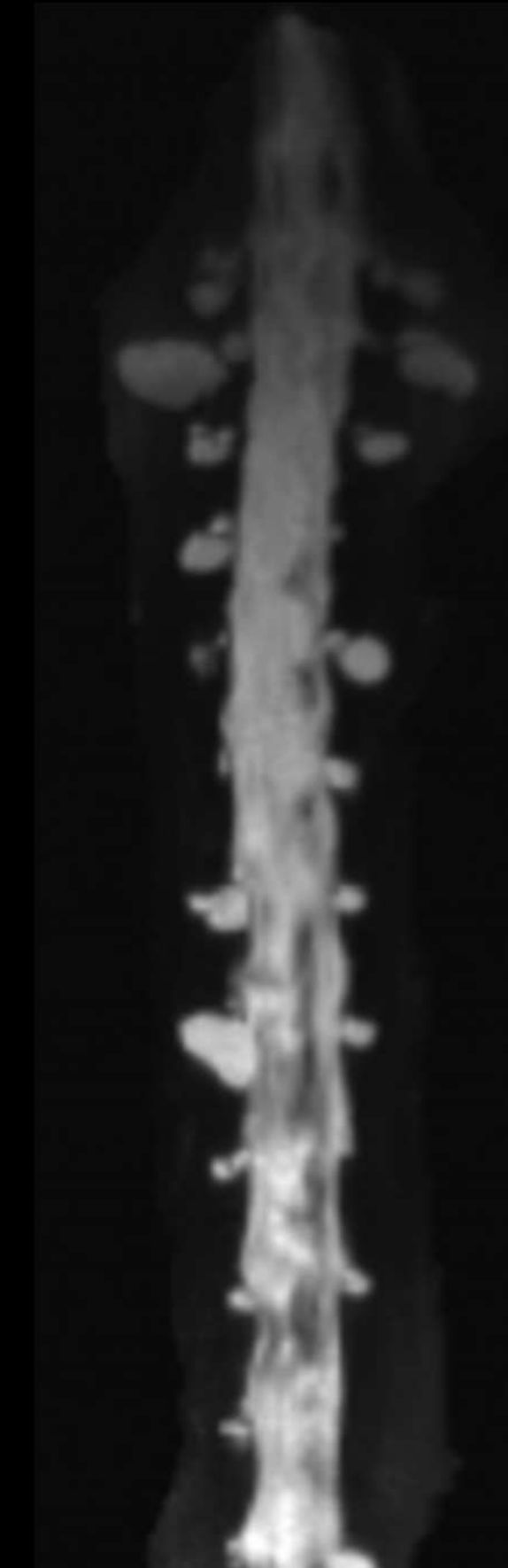
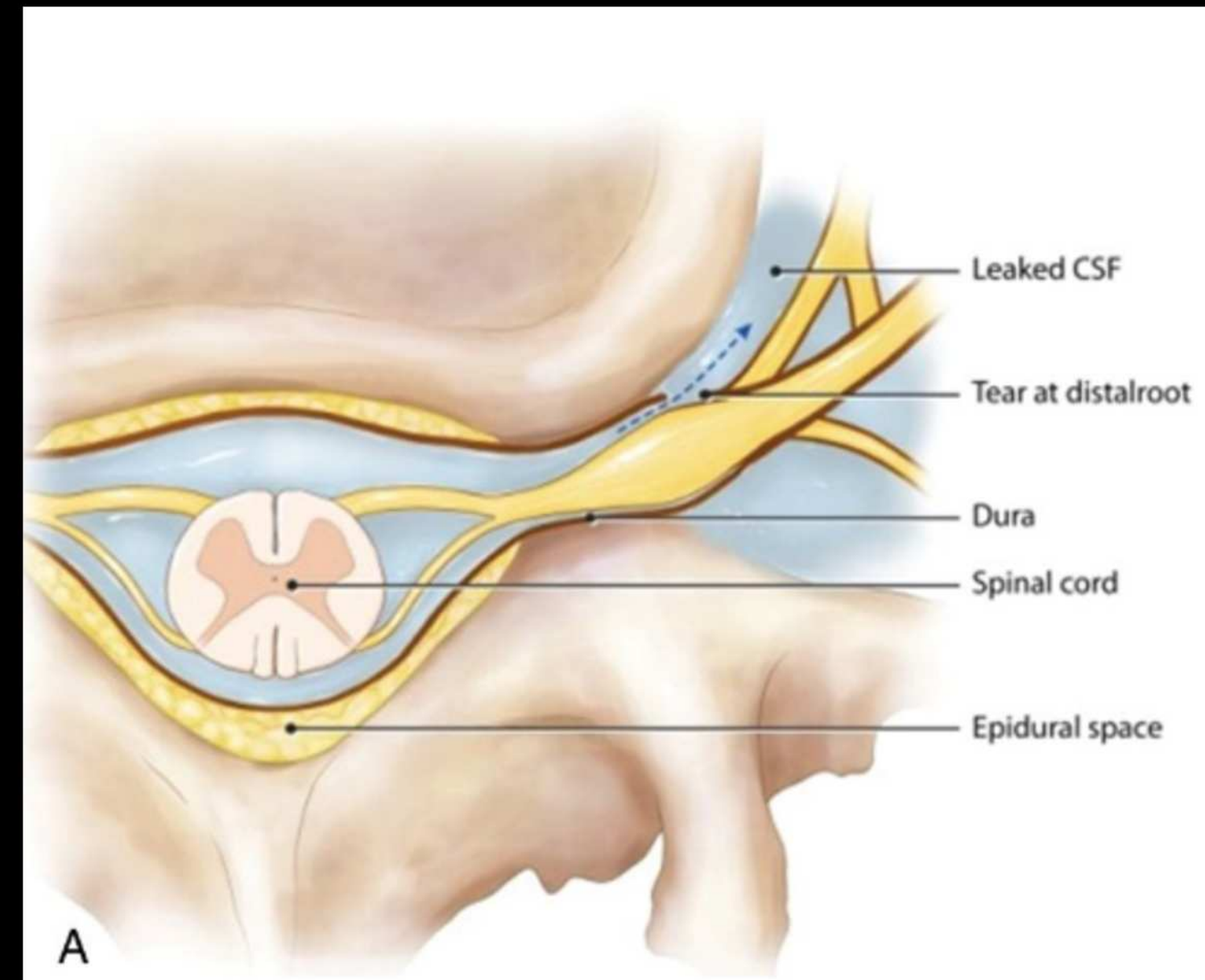
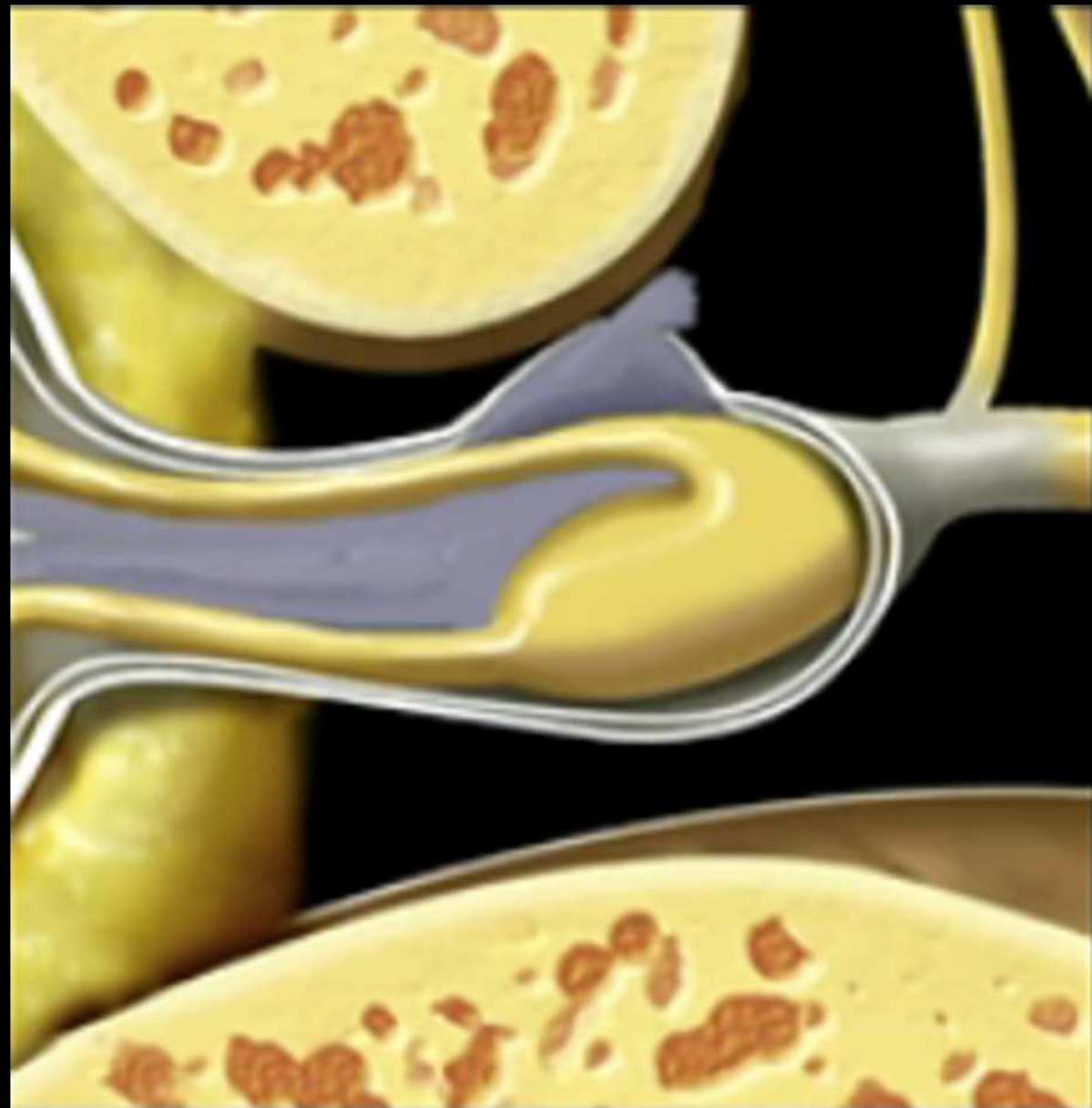
Dura rebenemine 27%

- Ventraalsel 96% - diskilubistuse tõttu
- Ekstraduraalne liikvorikogumik (ventraalsel)
- Liikvorileke on kiire



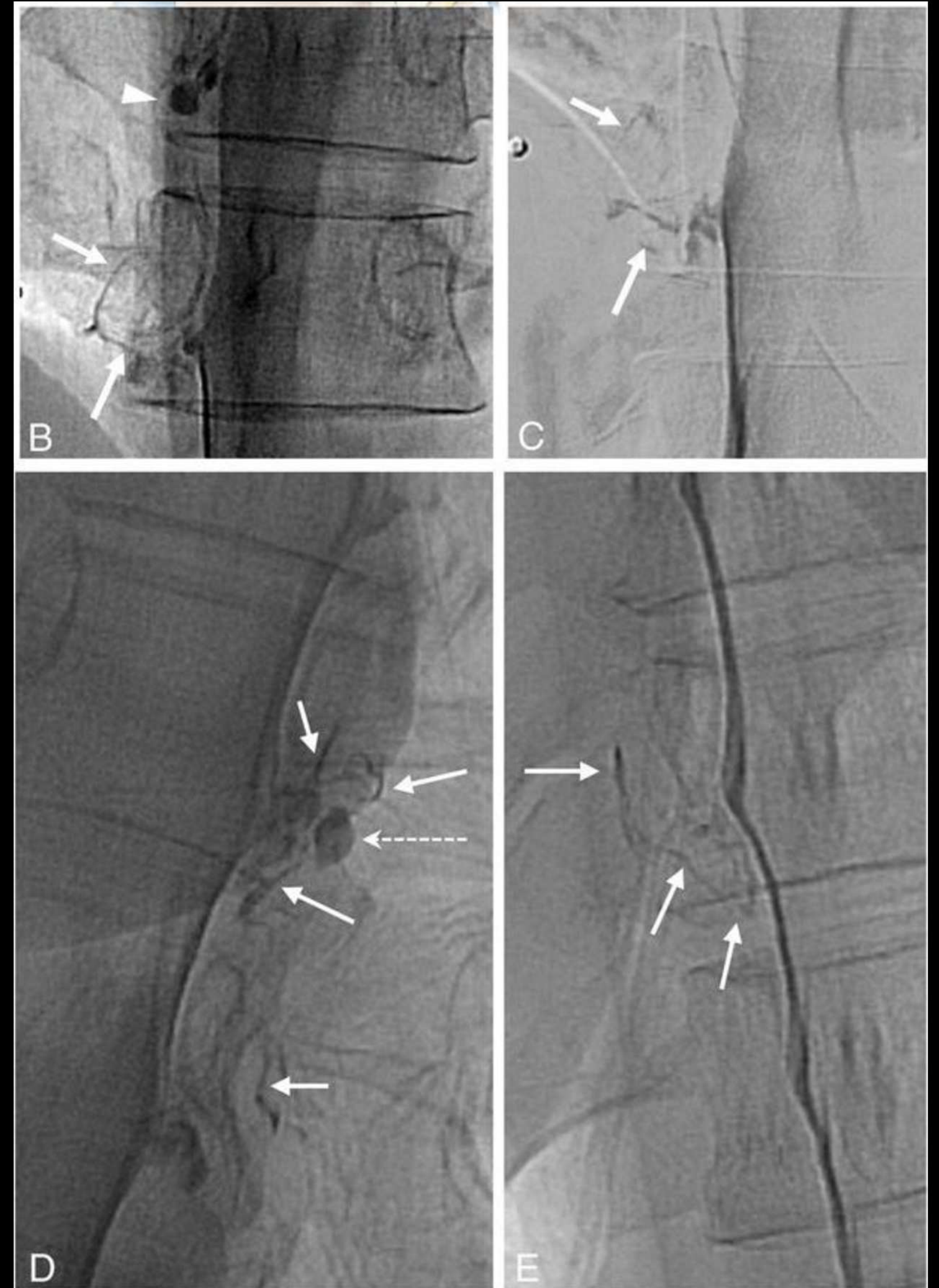
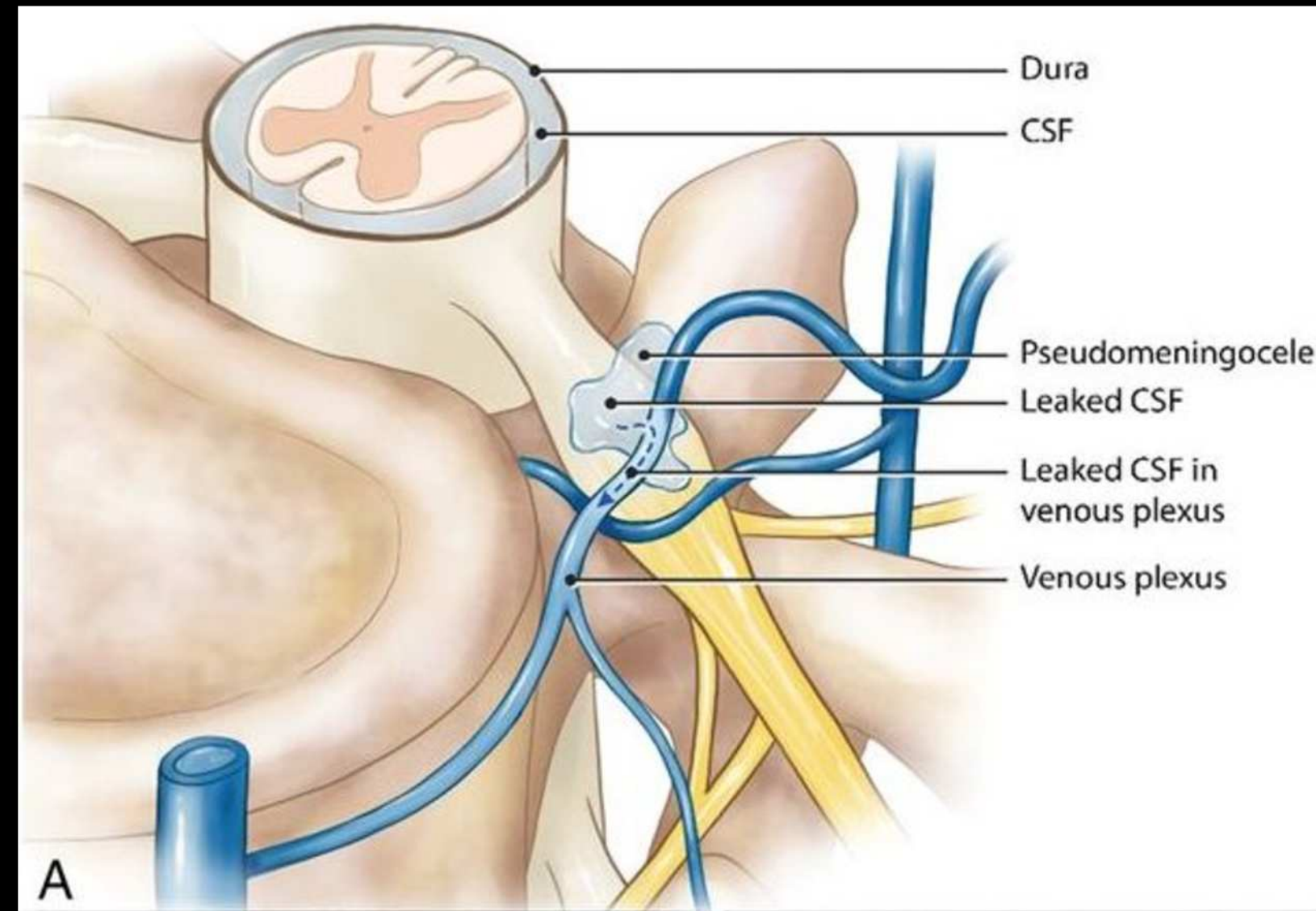
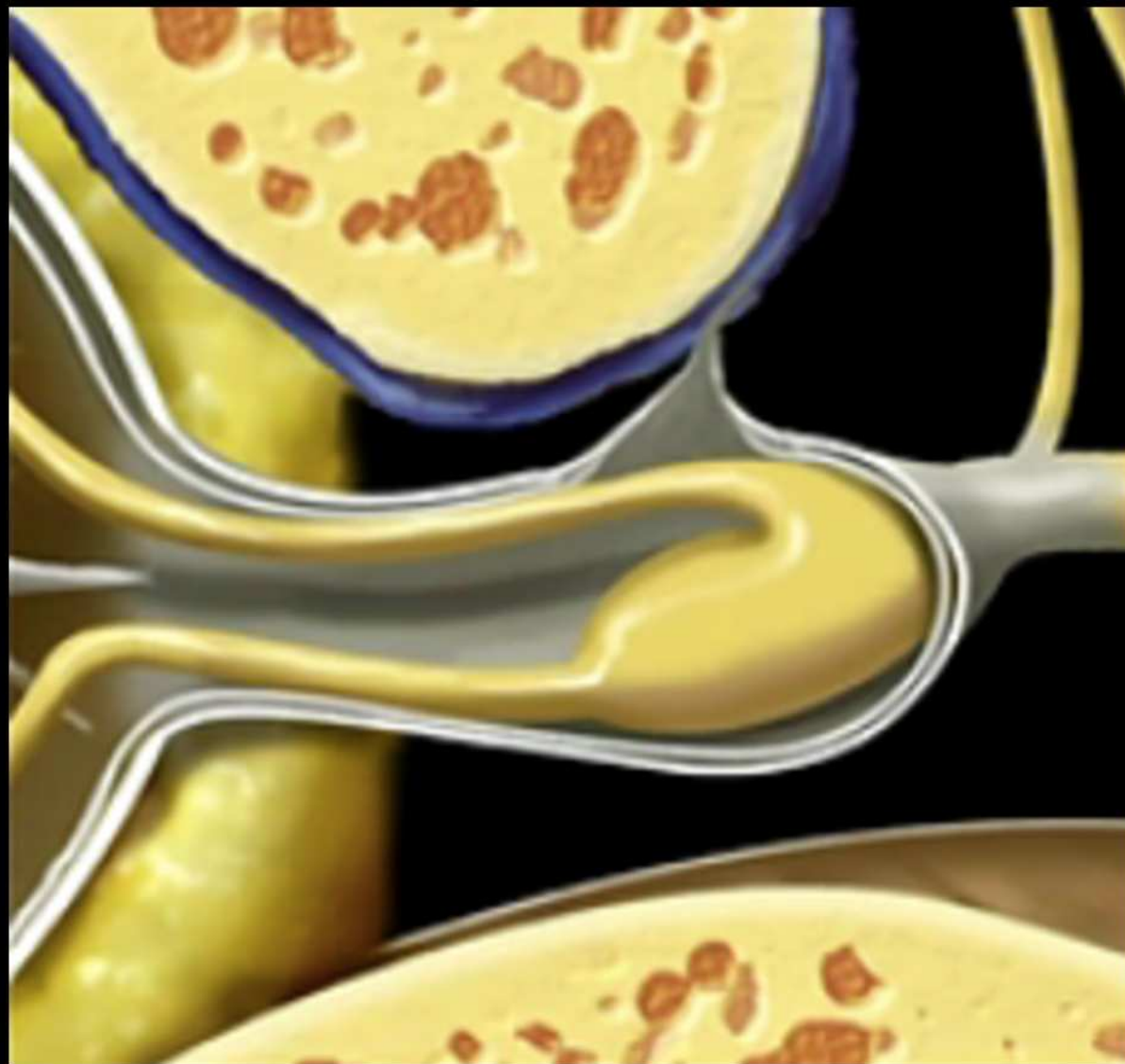
Meningeaalne divertikkel 42%

- Dura nõrkus, sidekoehaigused
- Ekstraduraalne vedelikukogumik 22%
- Liikvorileke võib olla nii kiire kui aeglane



CSF-venoosne fistel 2,5%

- Ekstraduraalseid liikvorikogumikke ei esine

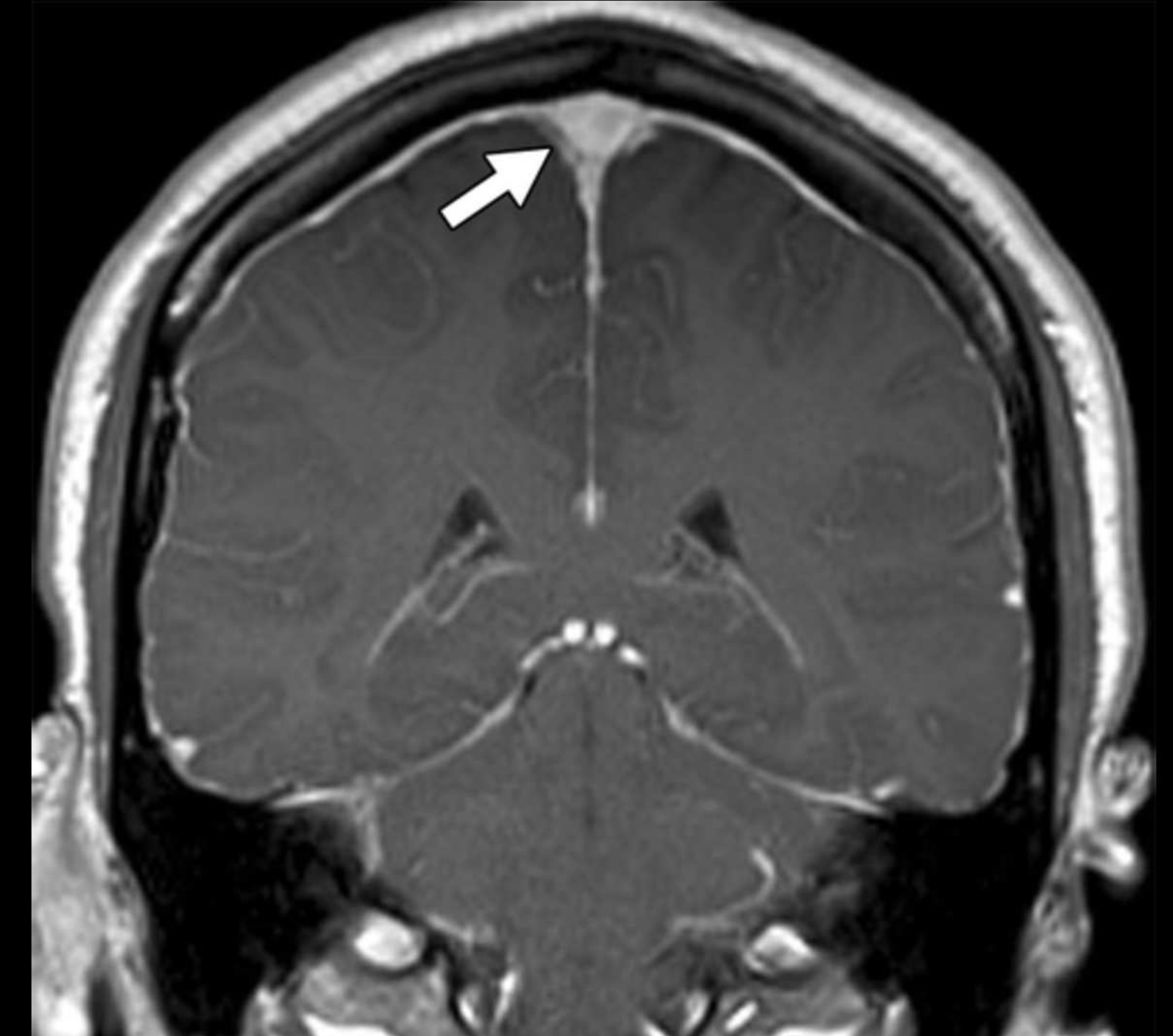
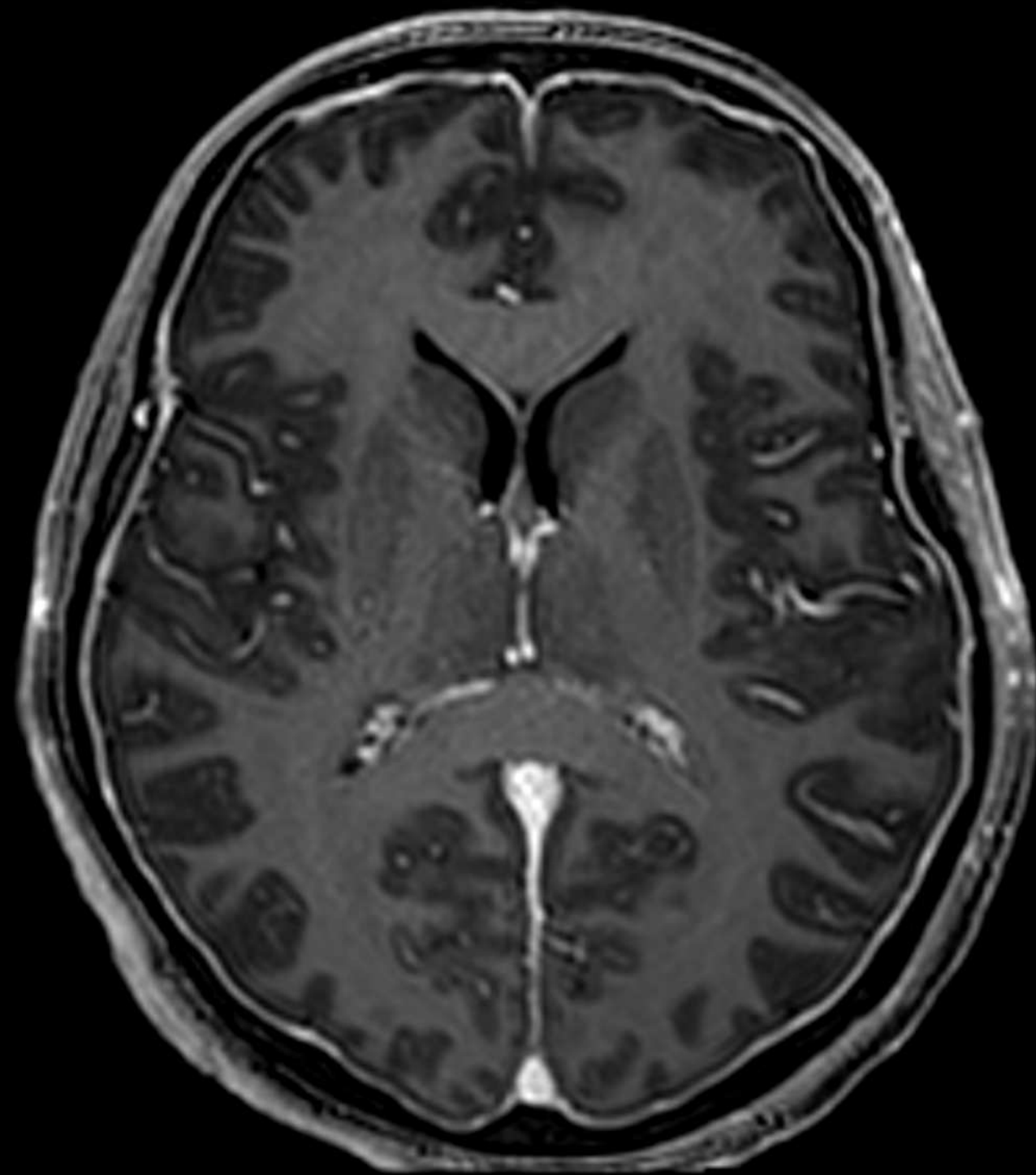




KOKKUVÕTE



Ortostaatilise peavalu korral kahtlusta intrakraniaalset hüpotensiooni!





Täna tähelepanu eest!

KIRJANDUS

- (1) Intracranial hypotension. Radiopaedia. Kättesaadav: <https://radiopaedia.org/articles/intracranial-hypotension-1?lang=us>
- (2) E. Papadaki. Diagnosis and Treatment of Intracranial hypotension. ECR 2019.
- (3) M. Michali-Stolarska et al. Diagnostic Imaging and Clinical Features of Intracranial Hypotension – Review of Literature. Pol J Radiol. 2017; 82: 842–849.
- (4) R. I. Farb et al. Spontaneous Intracranial Hypotension: A Systematic Imaging Approach for CSF Leak Localization and Management Based on MRI and Digital Subtraction Myelography. AJNR Am J Neuroradiol 40:745–53. Apr 2019.
- (5) P. G. Kranz et al. Imaging Signs in Spontaneous Intracranial Hypotension: Prevalence and Relationship to CSF Pressure. AJNR Am J Neuroradiol 37:1374 –78. Jul 2016.
- (6) J. Lin et al. The status of diagnosis and treatment to intracranial hypotension, including SIH. J Headache Pain. 2017; 18(1): 4.
- (7) B. Mokri. Spontaneous Low Pressure, Low CSF Volume Headaches: Spontaneous CSF leaks. Headache 2013;53:1034-1053.
- (8) CSF Leak Association. Kättesaadav: <https://www.csfleak.info>
- (9) F. E. Diehn et al. Uncommon Manifestations of Intervertebral Disk Pathologic Conditions. RadioGraphics 2016; 36:801–823.
- (10) W.I. Schievink et al. A classification system of spontaneous spinal CSF leaks. Neurology. 2016 Aug 16;87(7):673-9.
- (11) J. M. Hoxworth et al. Localization of a Rapid Cerebrospinal Fluid Leak with Digital Subtraction Myelography. American Journal of Neuroradiology Oct 2008.
- (12) W.I. Schievink et al. Lack of causal association between spontaneous intracranial hypotension and cranial cerebrospinal fluid leaks. J Neurosurg 116:749–754, 2012.
- (13) L.M. Shah et al. Intracranial Hypotension: Improved MRI Detection With Diagnostic Intracranial Angles. AJR:200, February 2013.
- (14) J.G. Smirniotopoulos et al. Patterns of Contrast Enhancement in the Brain and Meninges. RadioGraphics 2007; 27:525–551.
- (15) K. Grayson. Capnography in the patient with severe neurological injury. Kättesaadav: <https://www.ems1.com/ems-products/capnography/articles/capnography-in-the-patient-with-severe-neurological-injury-5ksMR7FvD9Fgp9b3/>