

IRM cérébrale pédiatrique en 2015 : variantes, incidentalomes et pièges

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FACULTY DISCLOSURE

Je n'ai aucune relation financière à déclarer

Qu'est ce qu'un incidentalome ?

- **Shoemaker 2011 :**
 - qui a potentiellement une importance sur la santé ou la reproduction, qui est découvert pendant la recherche mais qui n'était pas le but de l'étude
 - non attendu, sans rapport avec clinique, asymptomatique
- **Classification :**
 - varie selon les études
 - anomalies spécifiques/non spécifiques, variants normaux/anormaux
 - avec impact clinique / sans impact clinique
 - pas d'avis, avis routine, avis urgent, avis immédiat
- **Dépend de :**
 - 1.5 ou 3T, protocole
 - Âge
 - Sexe
 - Indication de l'IRM

Etudes pédiatriques

KIM 2002 (225 IRM, 1m-18 ans)

- **9% incidentalomes**, garçons x 2
- 36% d'avis, 0,6% avis urgent (1 cas)
- Fonction âge (asymétrie ventriculaire), sexe (cavum)

GUPTA 2008 (666 patients, 0-21 ans)

- **25,7% incidentalomes**,
- 21,2% uniques; 4,5% multiples
- 17% variantes de la normale; 8,7% lésions pathologiques
- 0,3% avis : KA, angiome veineux.

BIEBL 2015 (436 enfants, 0-18 ans)

- 35,5% IRM normales
- **37,4% incidentalomes (avec sinusite)**
- 27,1% lésions pathologique
- 47,9% incidentalomes et lésions pathologiques

Classification	Number of patients	Percentage of all 666 points	95% CI ^a
Normal-variants	113	17.0	14.1, 19.8
Asymmetric ventricles	14	2.1	1.0, 3.2
Cavum septum pellucidum	3	0.5	0.0 ^b , 0.9
Cysterna magna enlargement	1	0.2	0.0 ^b , 0.4
Enlarged perivascular spaces	25	3.8	2.3, 5.2
External hydrocephalus	4	0.6	0.01, 1.2
Pineal cyst	12	1.8	0.79, 2.8
Variant signal intensity	24	3.6	2.2, 5.0
White matter changes	30	4.5	2.9, 6.1
Abnormal	58	8.7	6.6, 10.9
Arachnoid cysts	12	1.8	0.79, 2.8
Chiari I malformation	11	1.7	0.68, 2.6
Cerebellar tonsillar ectopia	5	0.8	0.1, 1.4
Choroid plexus cyst	1	0.2	0.0 ^b , 0.4
Cortical atrophy	4	0.6	0.01, 1.2
Corpus callosum anomalies	5	0.8	0.096, 1.4
Internal hydrocephalus	1	0.15	0.0 ^b , 0.44
Lipoma	5	0.8	0.1, 1.4
Pachygyria	1	0.15	0.0 ^b , 0.4
Periventricular leukomalacia	3	0.45	0.0 ^b , 0.9
Post-traumatic changes	1	0.15	0.0 ^b , 0.4
Cervical syrinx	3	0.45	0.0 ^b , 0.9
Vascular malformations	6	0.9	0.2, 2.0

Etudes pédiatriques

- **Céphalées** (Yilmaz 2014, 449 enfnts, 11a)
 - 0,3% (2) tumeur/hydrocéphalie
 - 9% (29) incidentalomes (4% d'hypersignaux SB).
- **Retard de développement** (Griffiths 2011, 157 enfnts, 3m-18a)
 - 19% d'anomalies (LPV, malformations),
 - 10 % d'anomalies non spécifiques (retard myélinisation, ↓ vol SB, cavum pell)
- **Epilepsie** (Dura-Trave 2012, 457 enfnts, 1m-15a)
 - 22% lésions significatives (élargissement vl, lésions SB)
 - 13% incidentalomes
- **Puberté précoce** (Mogensen 2012, 229 enfnts)
 - 6,3 % de lésions pathologiques
 - 9,6% d'incidentalomes (10% kystes de la glande pinéale)
- **Drépanocytose** (Jordan 2010, 953 enfnts, 5-14a)
 - 6,6% d'incidentalomes (2% Chiari), 0,6% avis en urgence.
- **Volontaires sains** (Gur 2012, 1400 patients, 8-23 a, 3T)
 - 10% incidentalomes (2% kystes de la glande pinéale)

TABLE 1 Incidental Intracranial MRI Findings for 953 Children With SCD Screened for SIT Trial

Classification and Abnormality	No.
No referral	
Cavum septum pellucidum, vergae, or velum interpositum	11
Choroidal fissure cyst	6
Gray matter heterotopia	5
Arachnoid cyst	4
Prominent perivascular (Virchow-Robin) spaces	3
Pineal cyst	3
Absent septum pellucidum	2
Arachnoid cyst vs prominent cerebrospinal fluid space	1
Occipital bone cyst, possibly epidermoid	1
Routine referral	
Chiari I malformation	20
Idiopathic ventriculomegaly	1
Temporal lobe cystic change	1
Cortical dysplasia	2
Arachnoid cyst, large	1
Rathke cleft cyst, purely intrasellar	1
Urgent referral	
Chiari I malformation with large spinal cord syrinx	2
Possible tumor, tectal glioma	1
Possible tumor vs dysplasia, temporal lobe cystic lesion	1
Possible tumor, hippocampus	1
Possible tumor, corpus callosum	1
Total	68^a

Incidentalomes

- **Important de distinguer :**
 - lésions qui nécessitent un avis spécialisé, une surveillance, qui s'intègrent dans un cadre pathologique
 - « leave me alone lesions » : éviter angoisse contrôles, chirurgie inappropriée

- **Enfant**

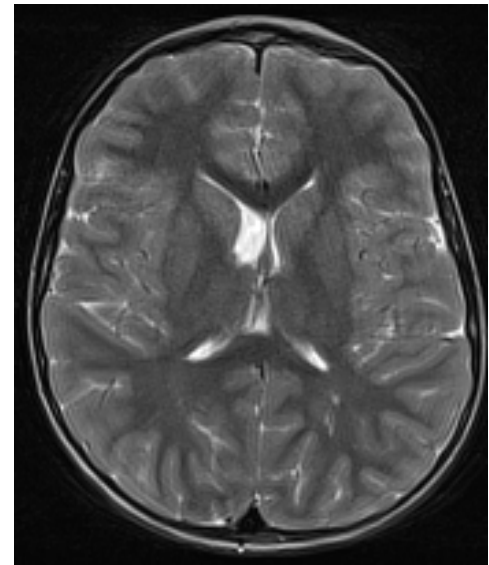
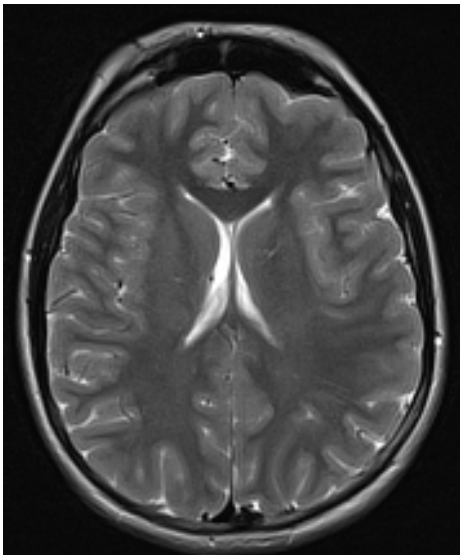
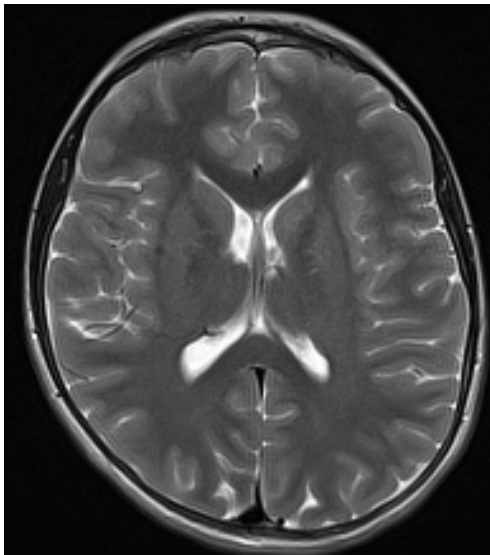
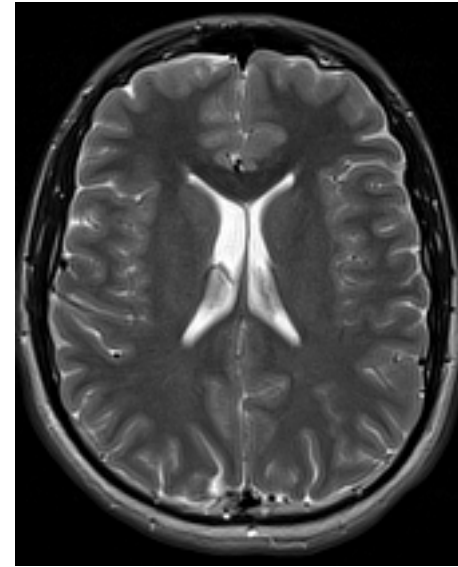
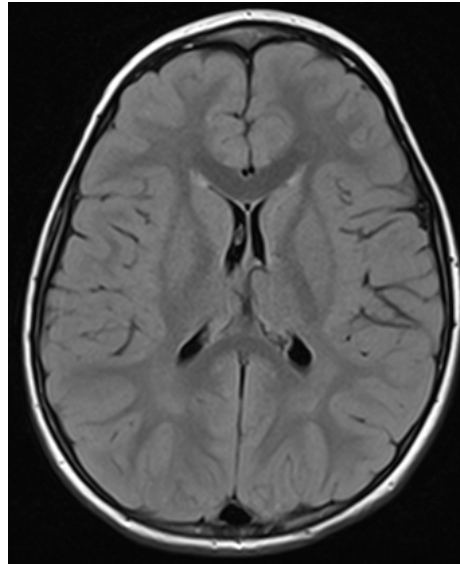
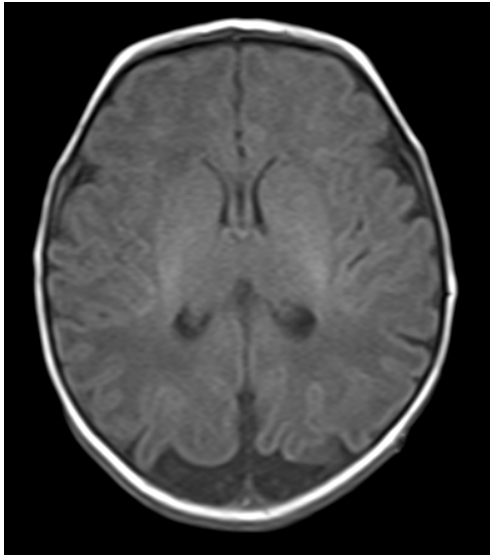
- Kystes
- Virchow-Robin
- Chiari
- Lésions focales de SB
- Anomalies de développement

- **Adulte**

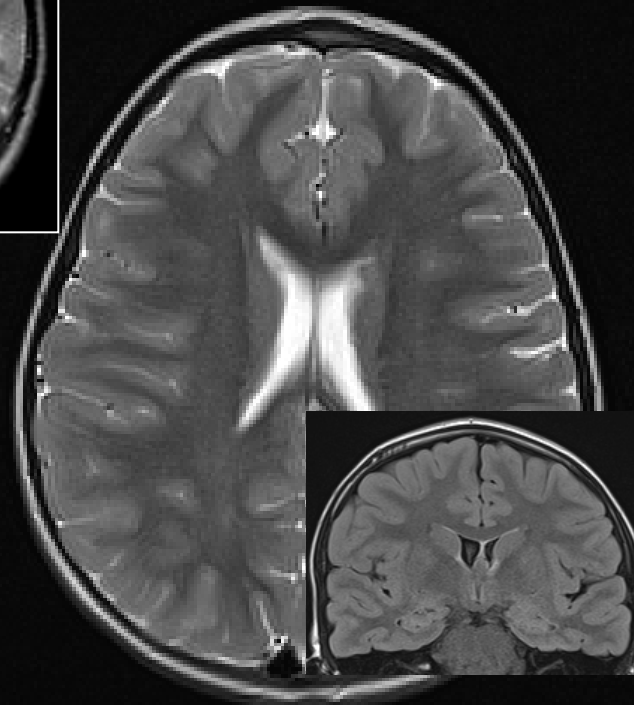
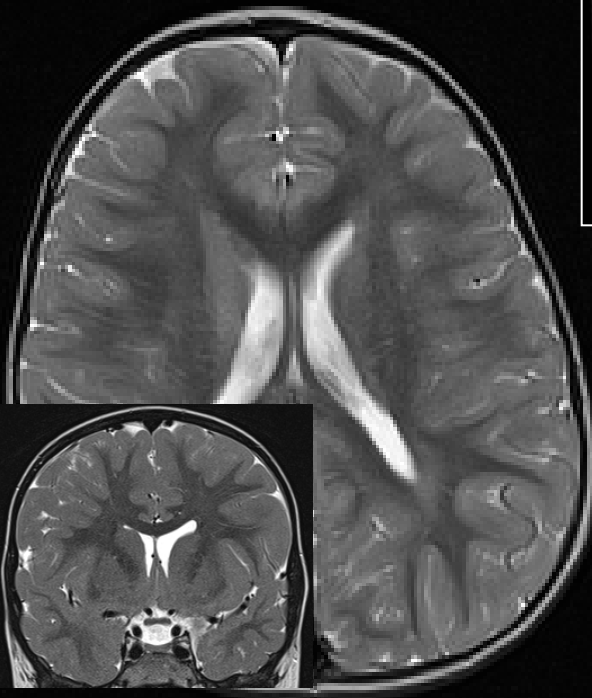
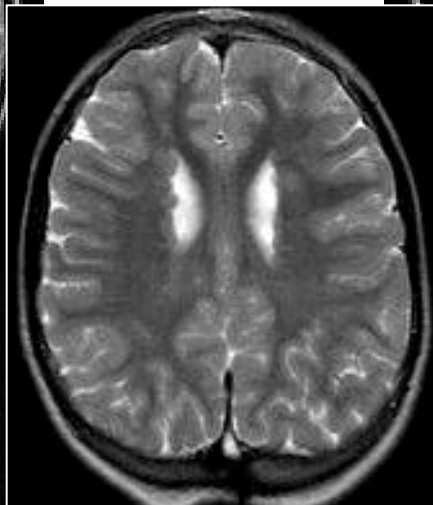
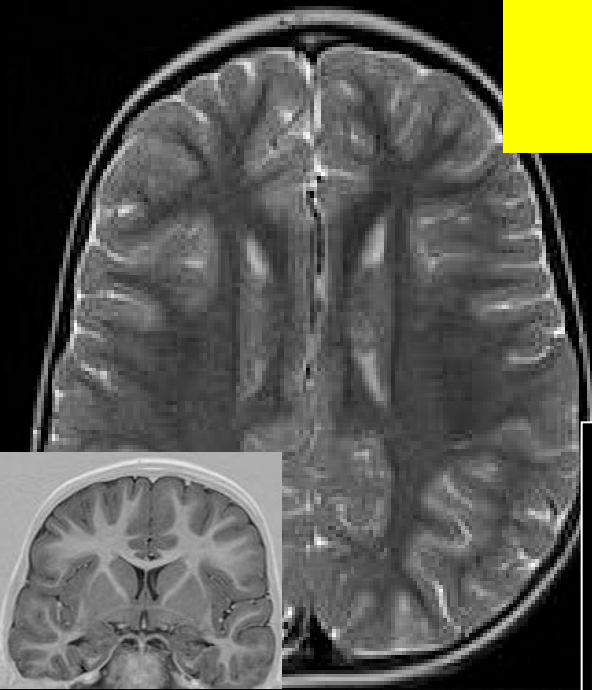
- Ischémie silencieuse
- Tumeurs primitives
- Anévrismes

VENTRICULES, CITERNES, FISSURES

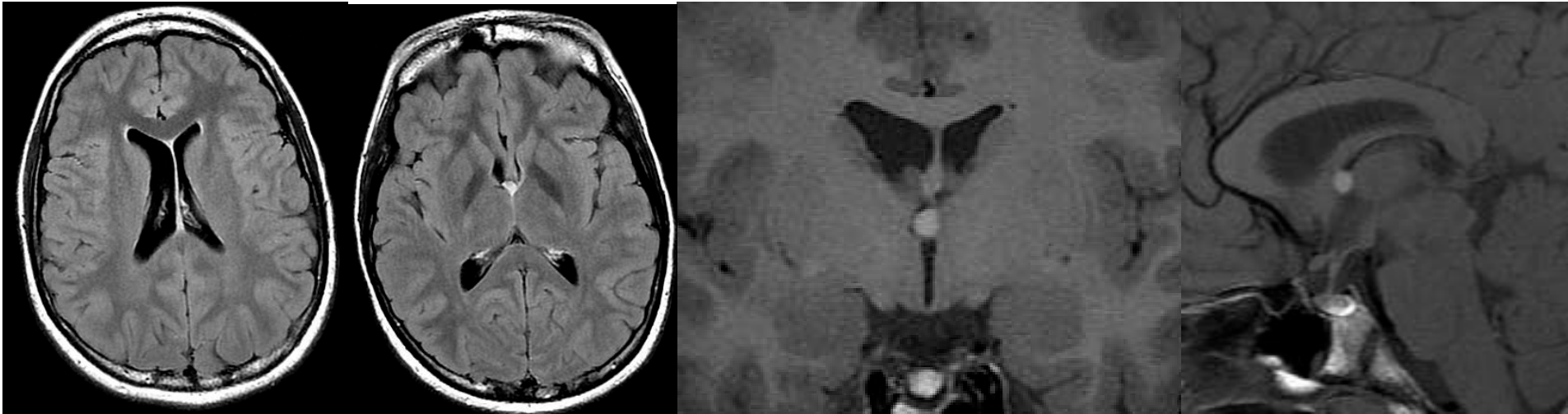
Aspect collabé ou asymétrique des ventricules latéraux



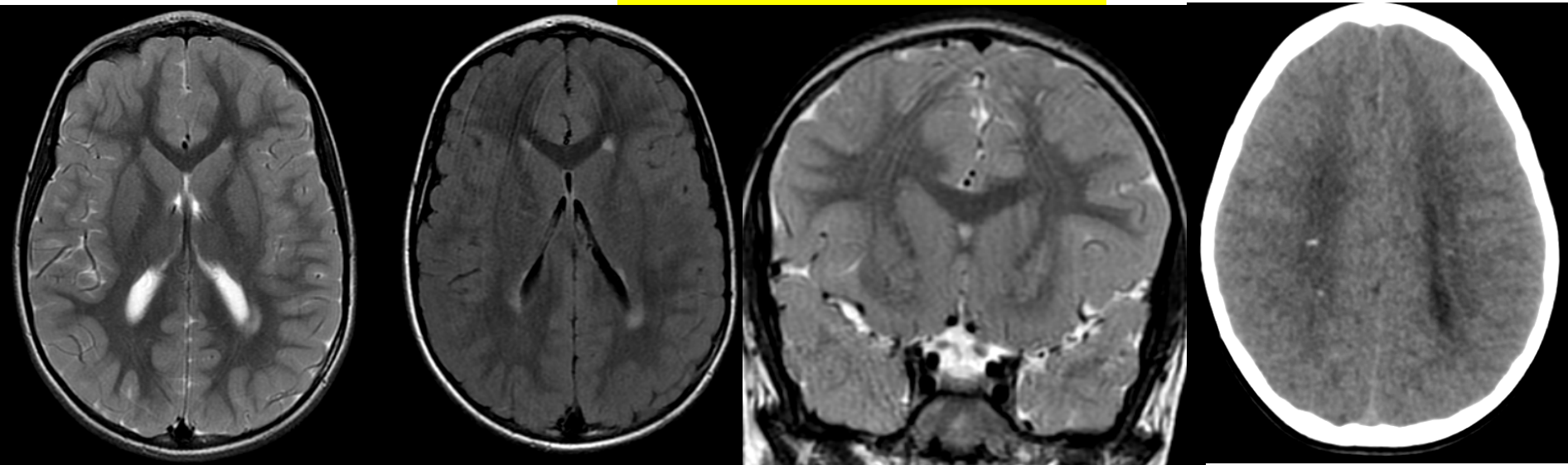
Pseudo-hétérotopies

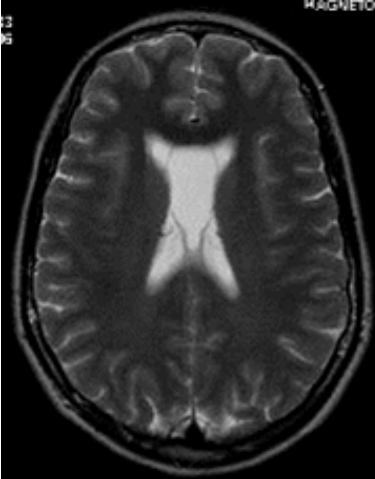
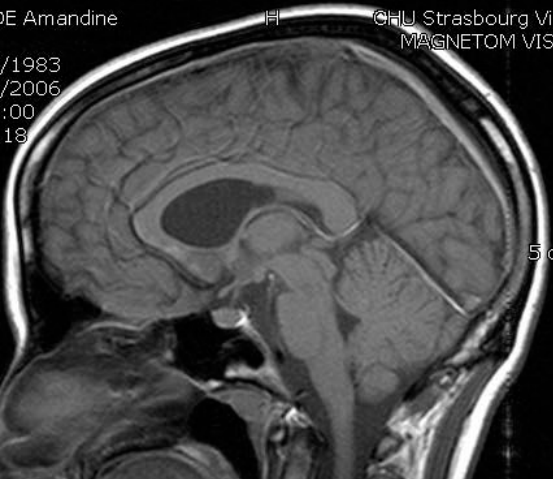


Kyste colloïde

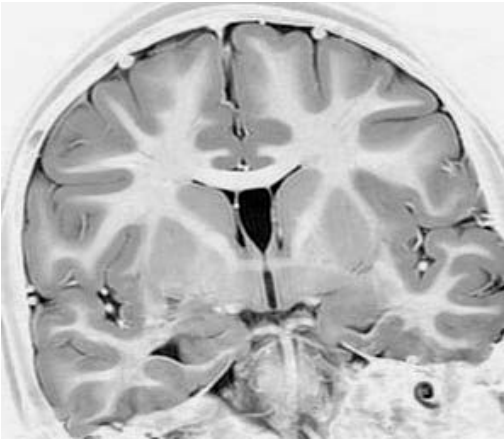
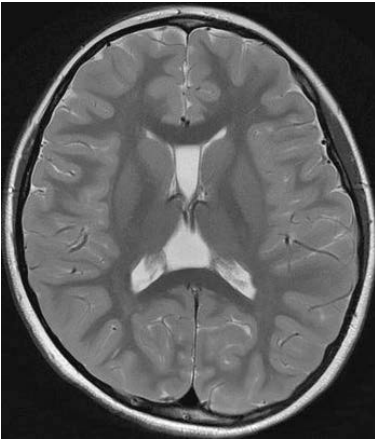
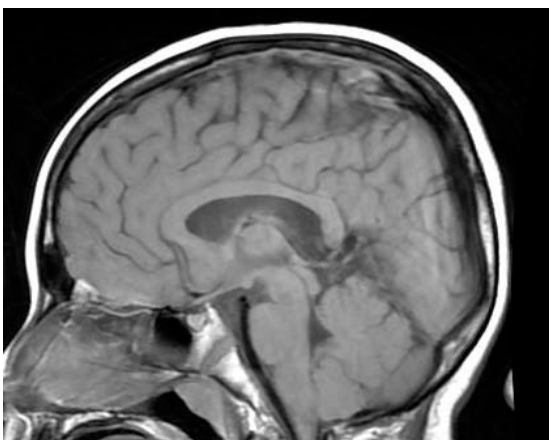
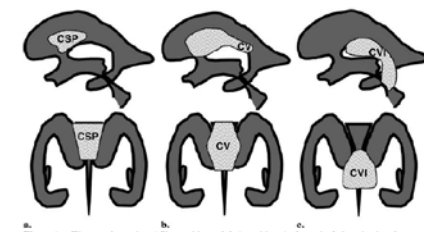


Séquelles infection CMV

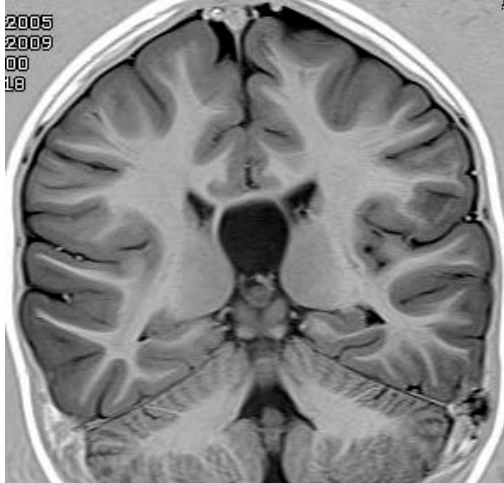




Cavum septum pellucidum



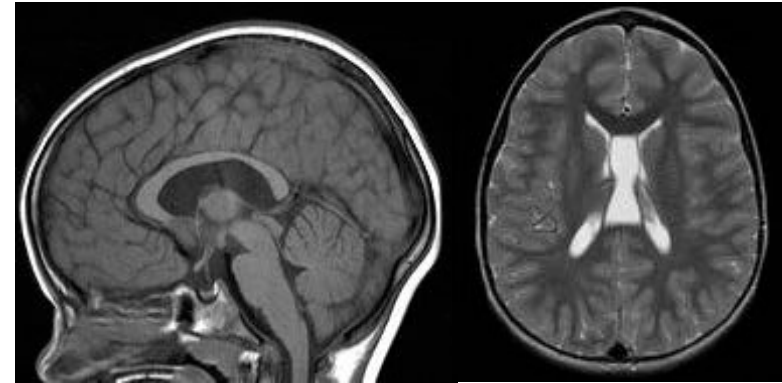
Cavum vergae



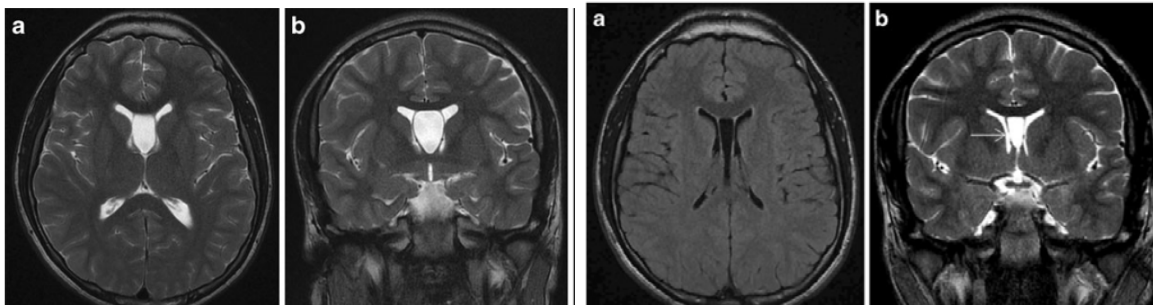
Cavum velum interpositum

Cavum septum pellucidum, vergae

- Septum pellucidum :
 - 2 feuillets, 2 cavités :
 - avant : cavum septum pellucidum
 - arrière (colonnes fornix) : cavum vergae
 - fusion 2 feuillets 6 mlU arr vers avant, disparition à 3 mois postnatal
 - tous les prématurés, 82% terme, garçons
 - 6 mois-adulte : 0,1 à 19 % CSP, 0 à 1,3 % CV



- Dilatation kystique :
 - 0,04%, >1cm, bombement parois latérales, sécrétion LCS par kyste, communiquant ou non avec VL, blocage +/- intermittent Monroe, hydrocéphalie, HTIC, céphalées, compression veines, triangle hypothalamoseptal, psychose, rupture spontanée.



Childs Nerv Syst (2012) 28:813–819
DOI 10.1007/s00381-012-1760-6

CASE-BASED UPDATE

Cavum septum pellucidum cyst in children: a case-based update

Alin Borha • Keven F. Ponte • Evelyne Emery

Cavum velum interpositum

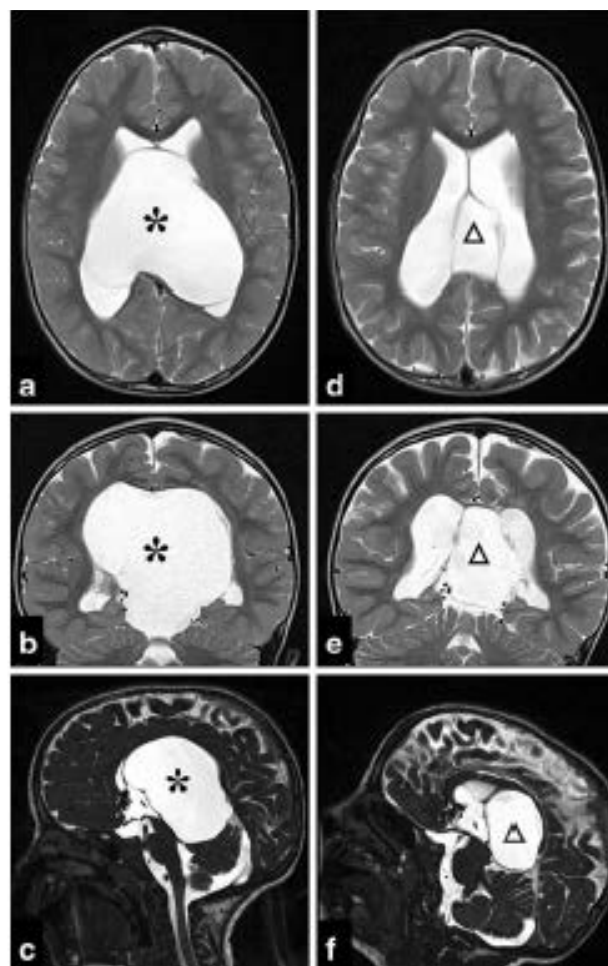
- limité en haut par piliers des fornix, en bas par toile choroïdienne du V3 et veines cérébrales internes
- triangulaire en axial
- du trou de Monroe en avant vers veine de Galien en arrière.
- bordé par les plexus choroïdes des vl latéralement
- communication post persistante d'une fissure du toit du diencephale.
- extension ant de la citerne de la plaque tectale localisée au dessus de la glande pinéale
- incidence diminue avec l'âge (3% <2 ans).



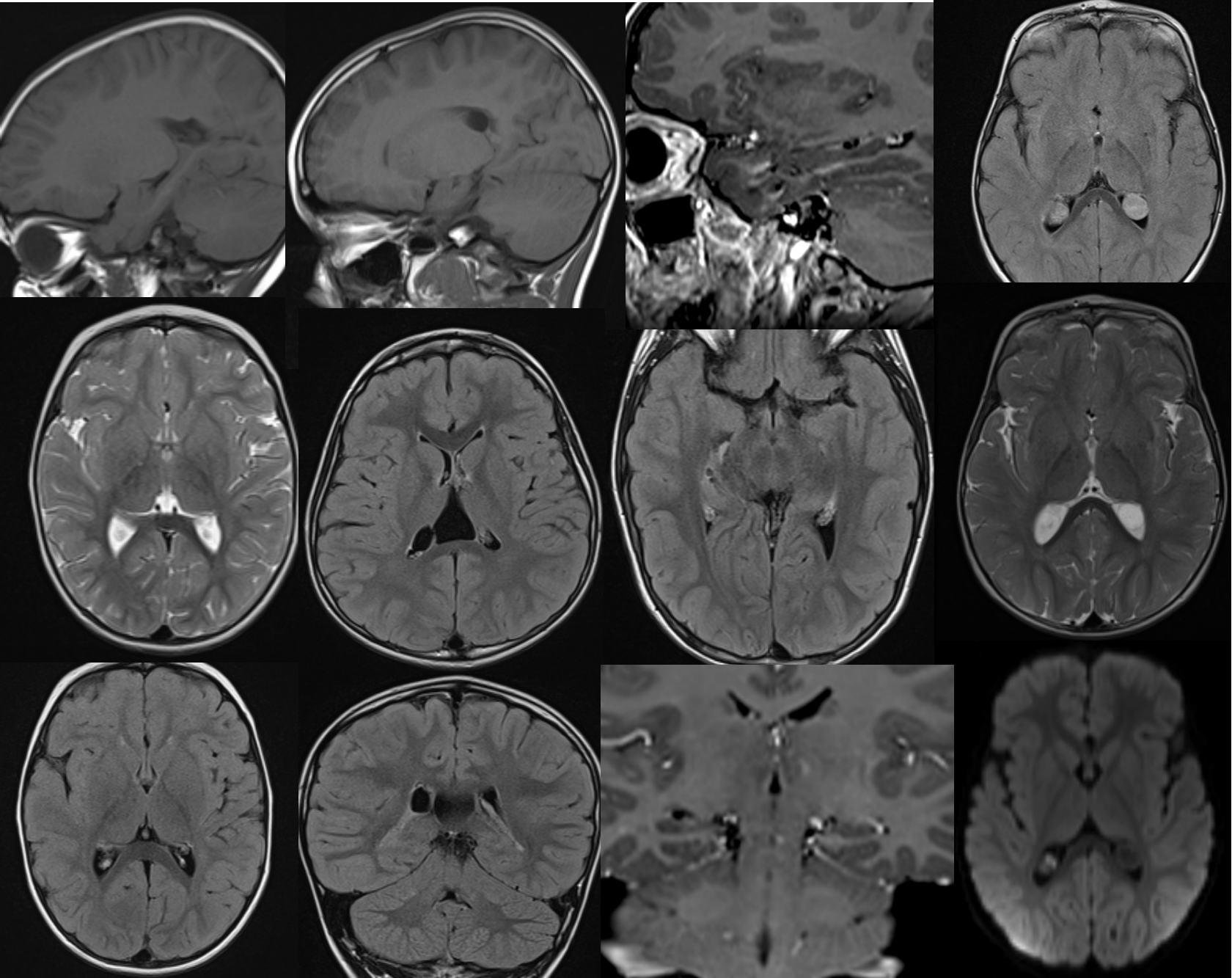
Kyste arachnoïdien
de la citerne quadrigéminale

Endoscopic fenestration of cavum velum interpositum cysts: a case study of two symptomatic patients

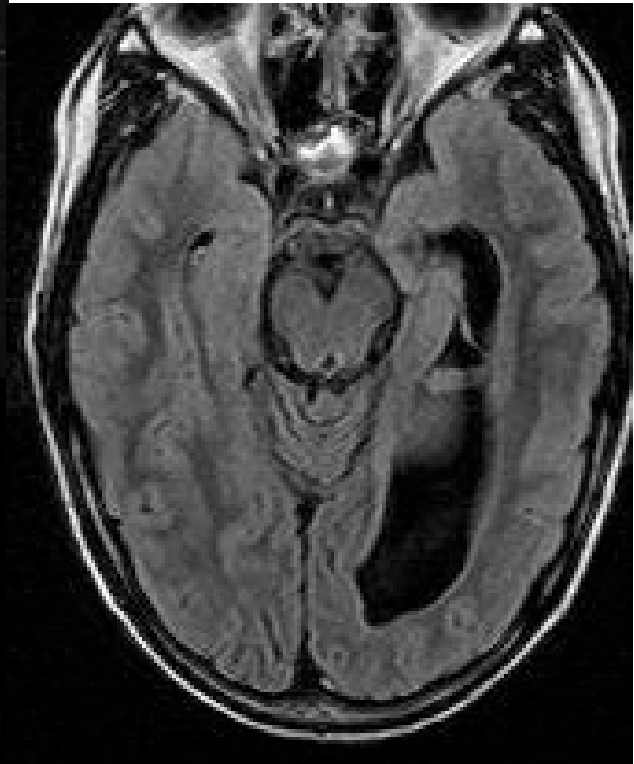
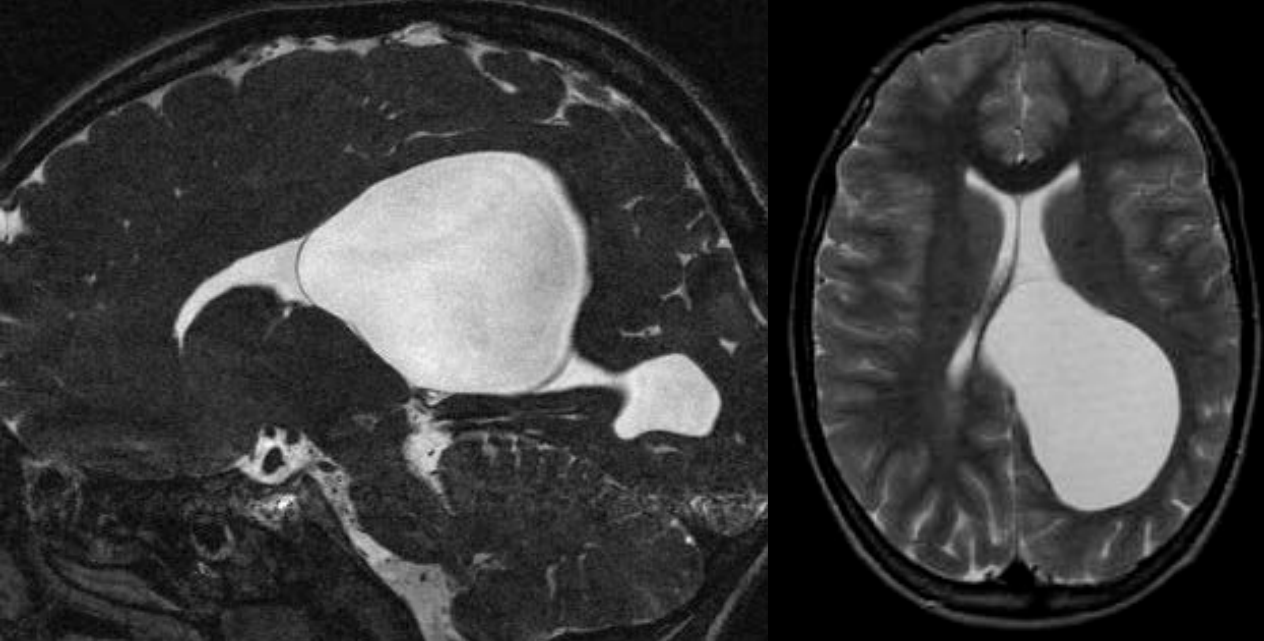
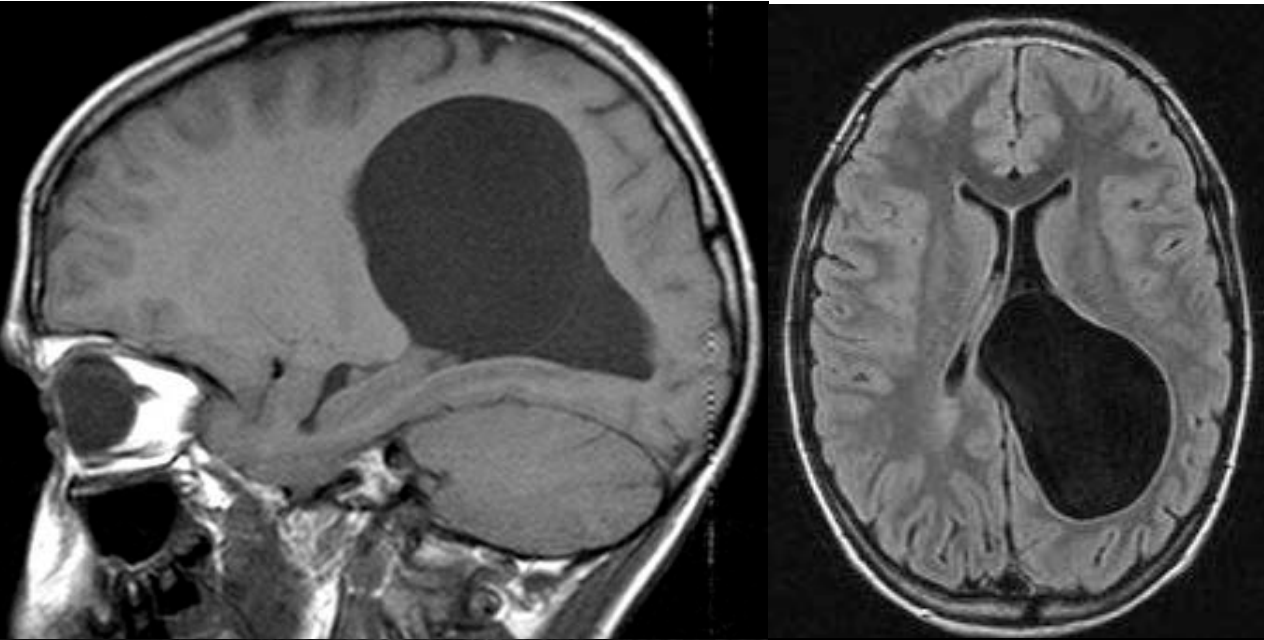
Calvin K. W. Tong · Ashutosh Singhal ·
D. Douglas Cochrane



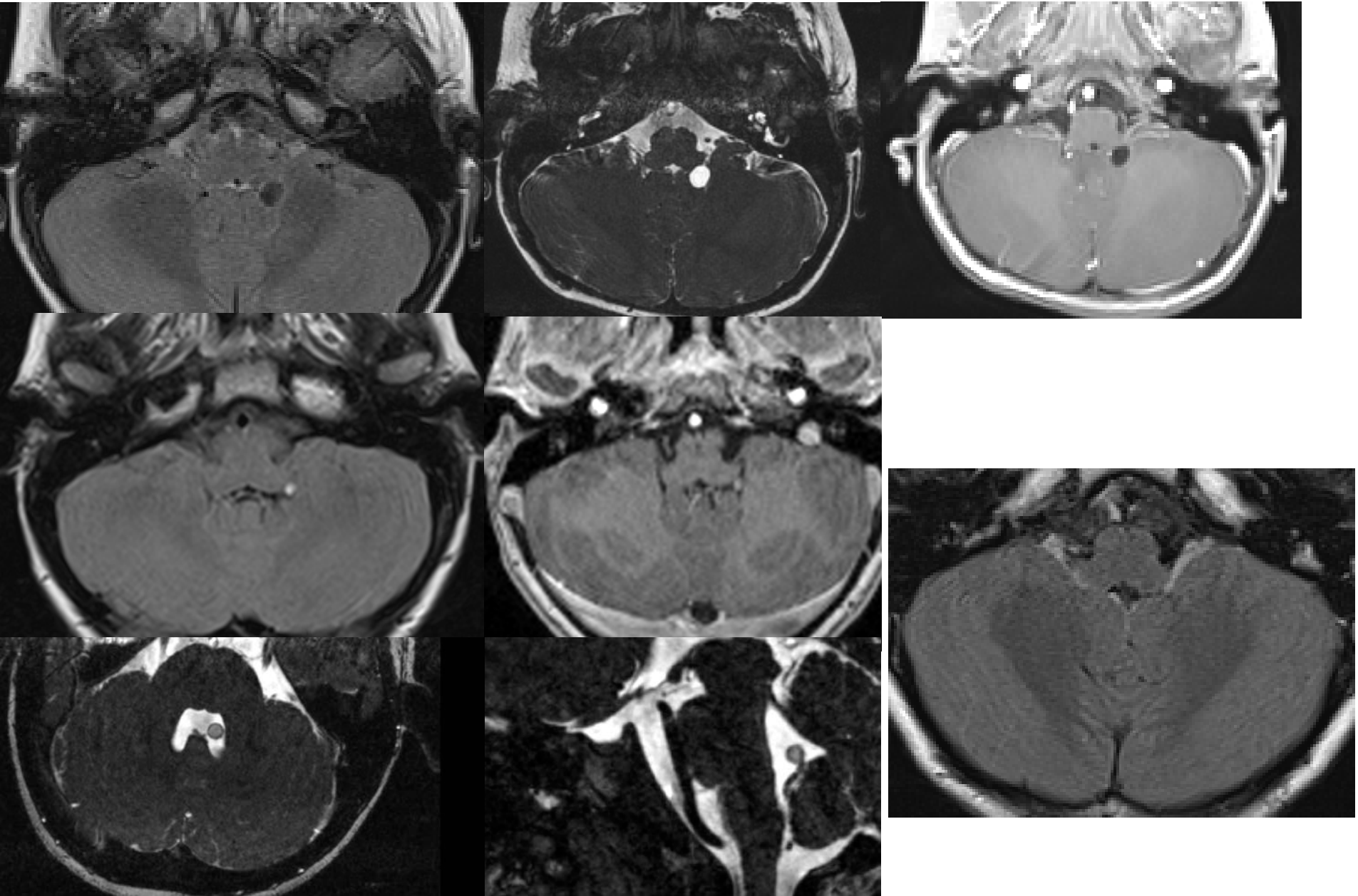
Kystes des plexus choroïdes



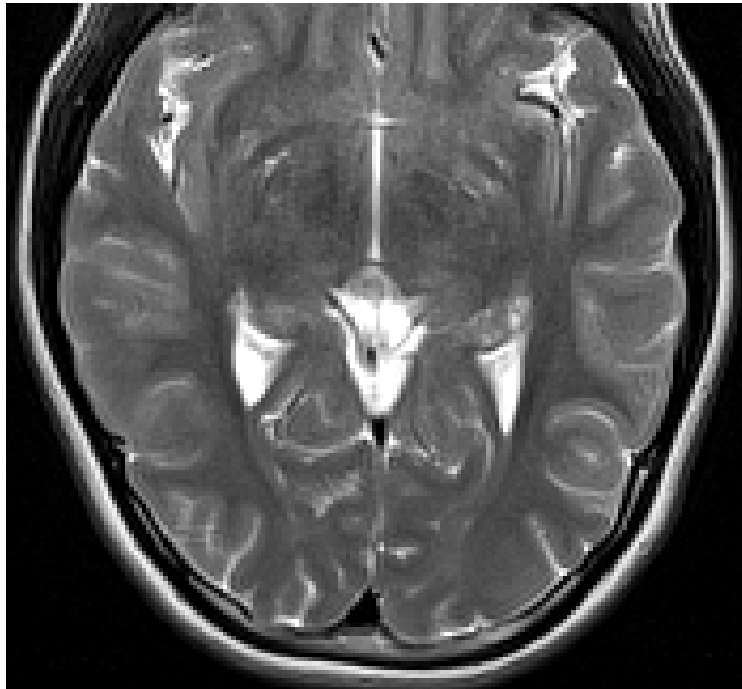
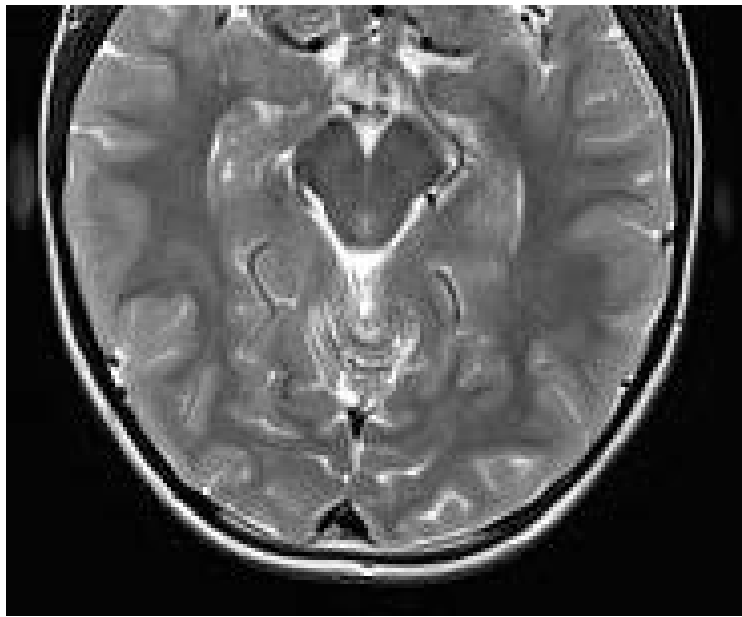
Kystes épendymaires

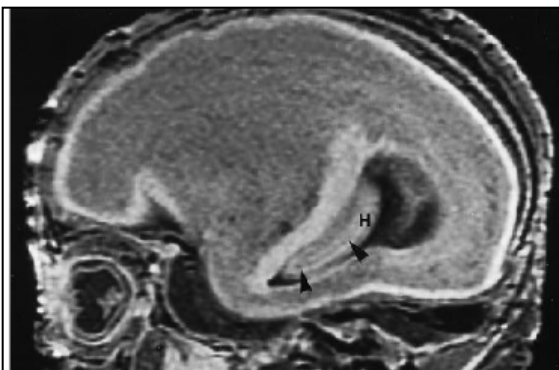
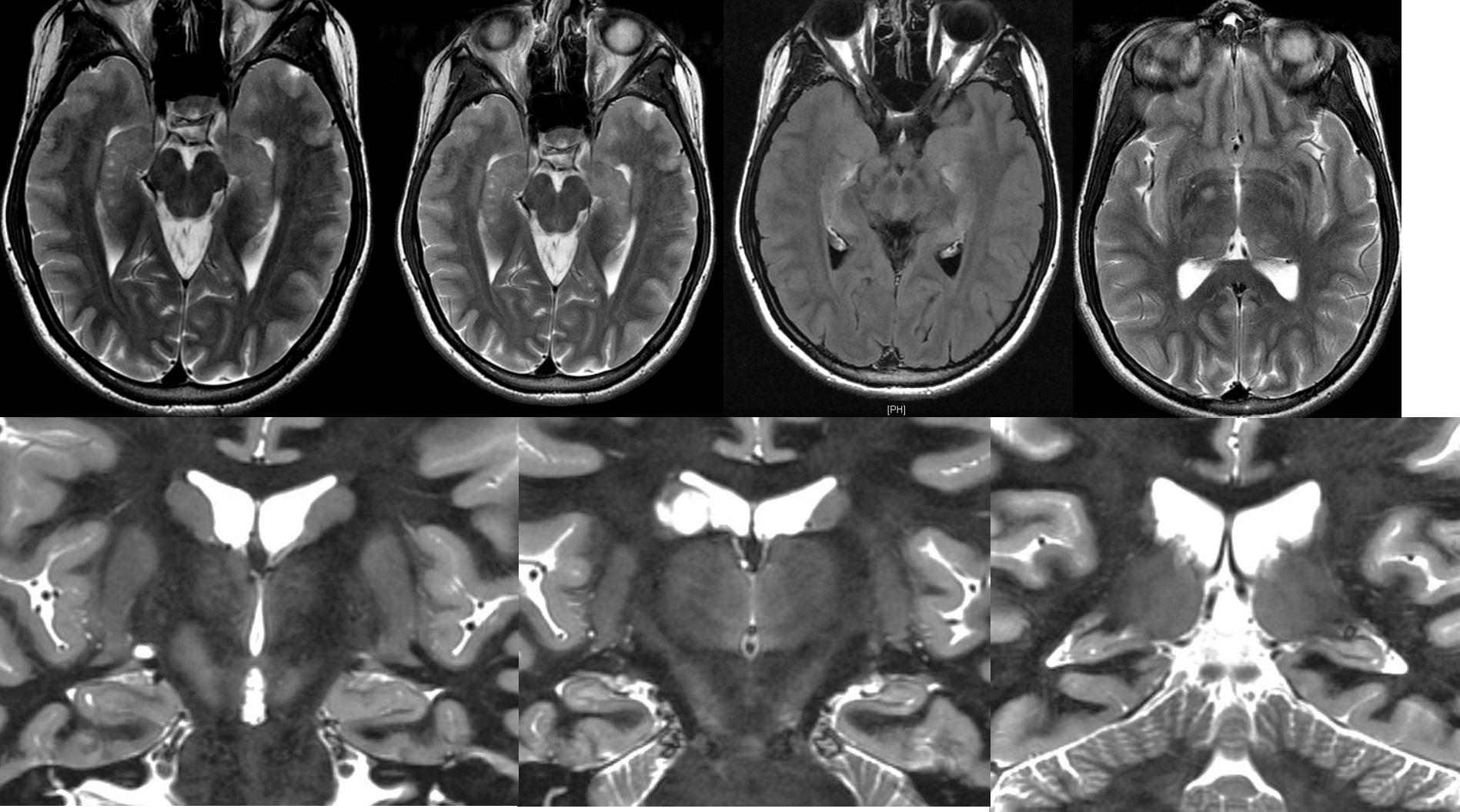


Kystes des trous de Luschka



Kystes de la région hippocampique : kystes de la fissure hippocampique



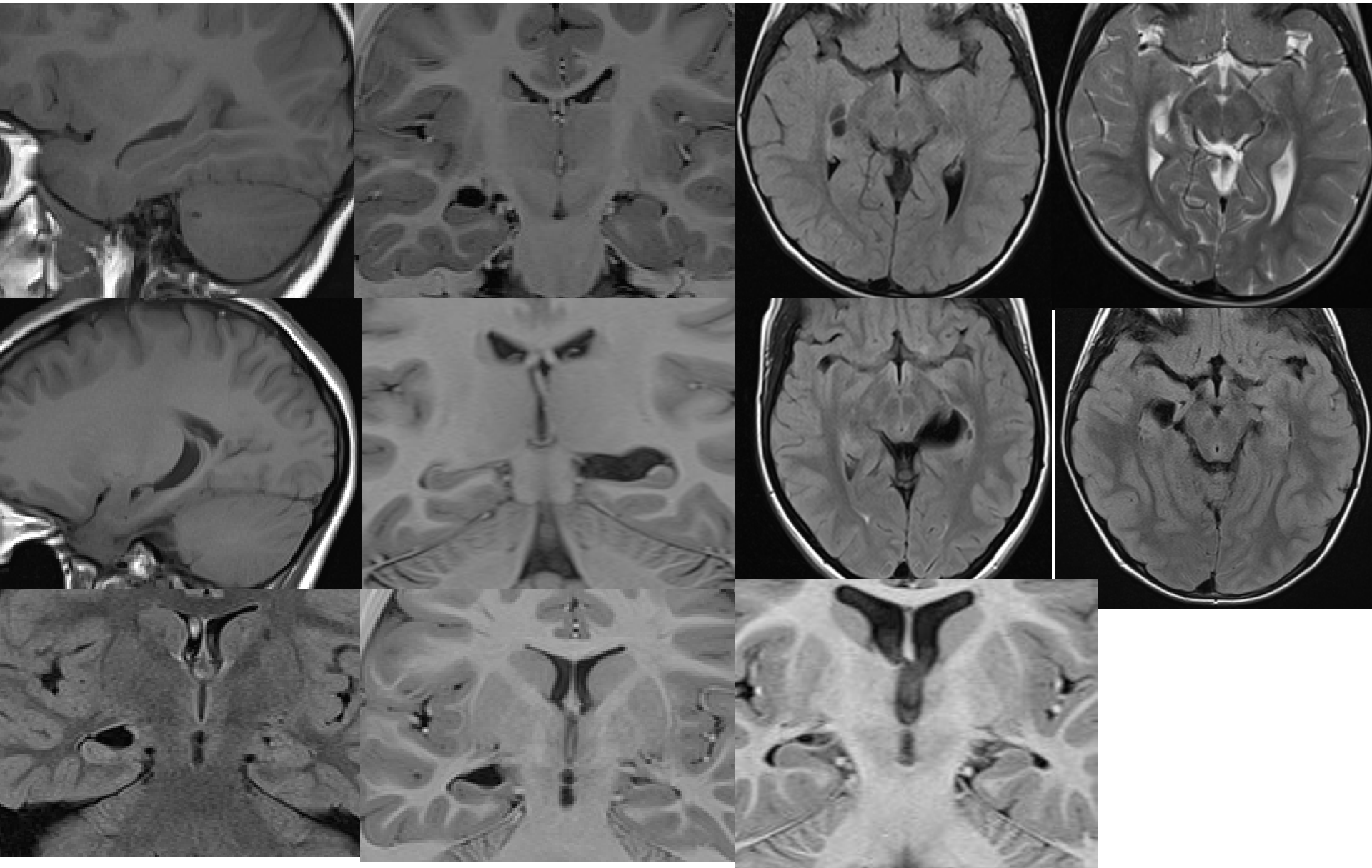


Limbic lobe embryology and anatomy: dissection and MR of the medial surface of the cerebral hemisphere.

Kier EL, Fulbright RK, Bronen RA.

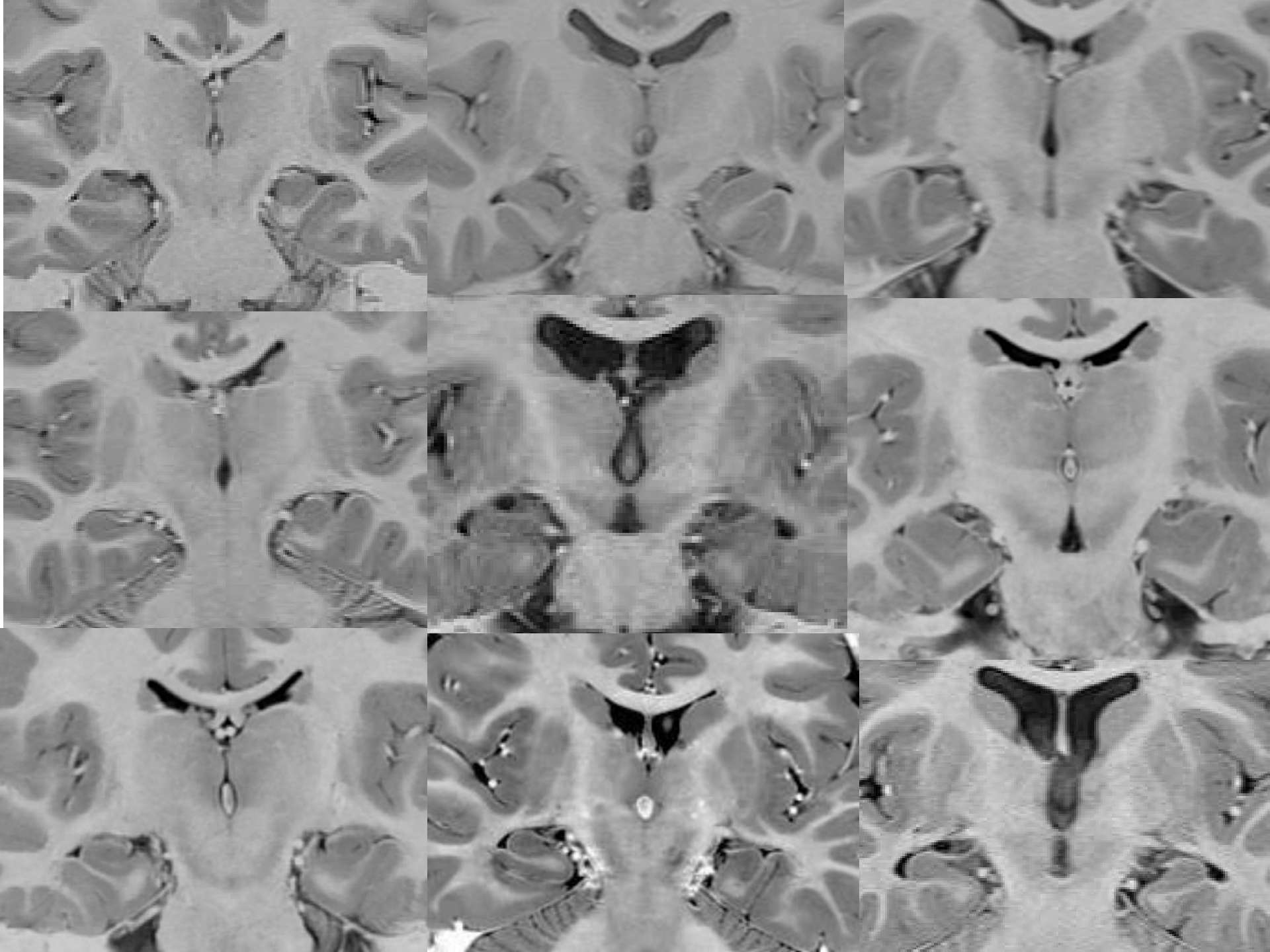
AJNR 1995

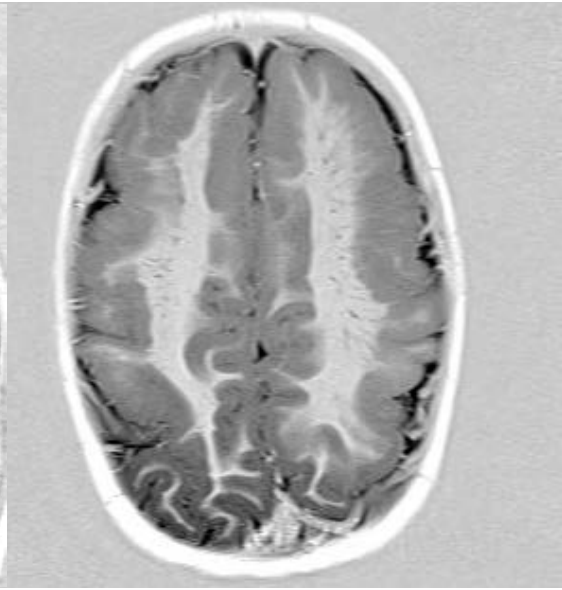
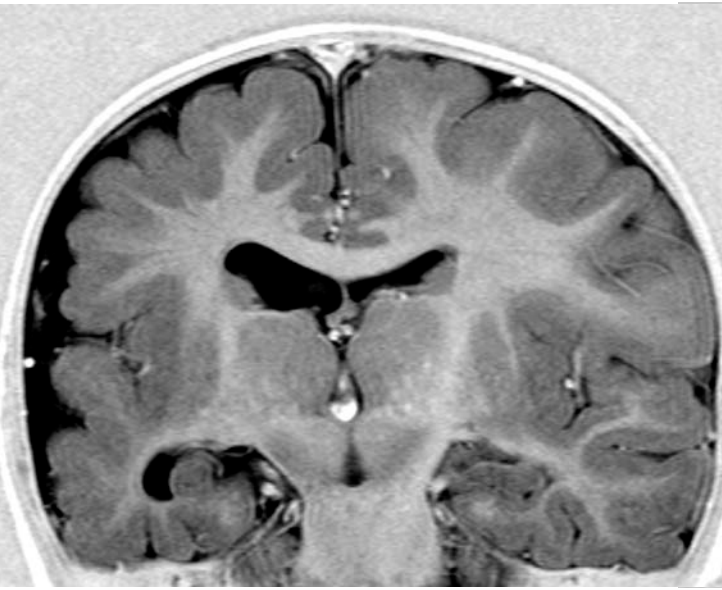
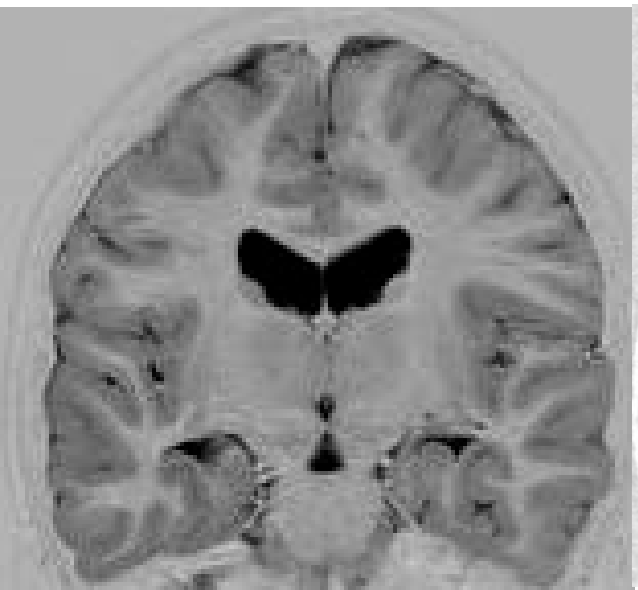
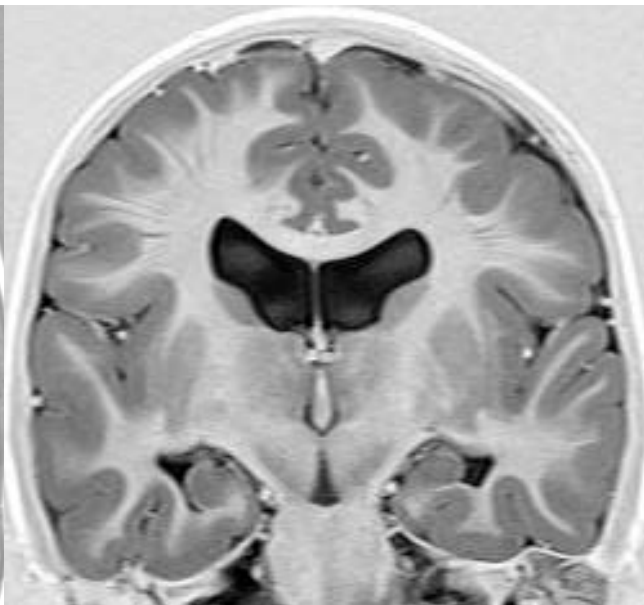
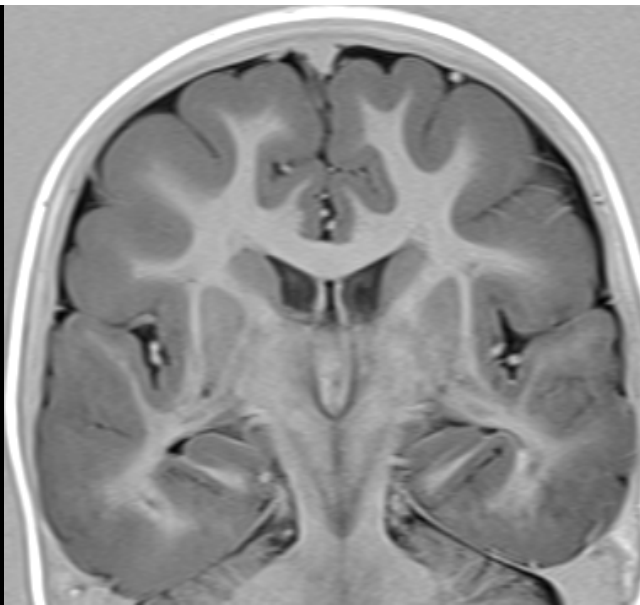
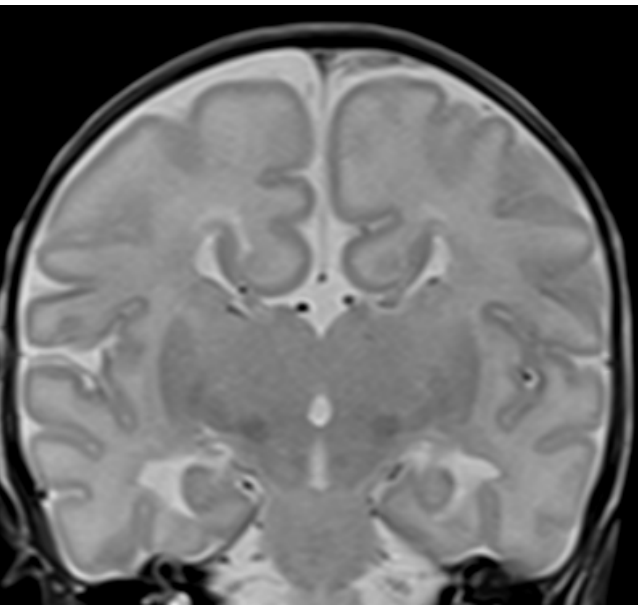
Kystes de la région hippocampique : kystes de la fissure choroïdienne



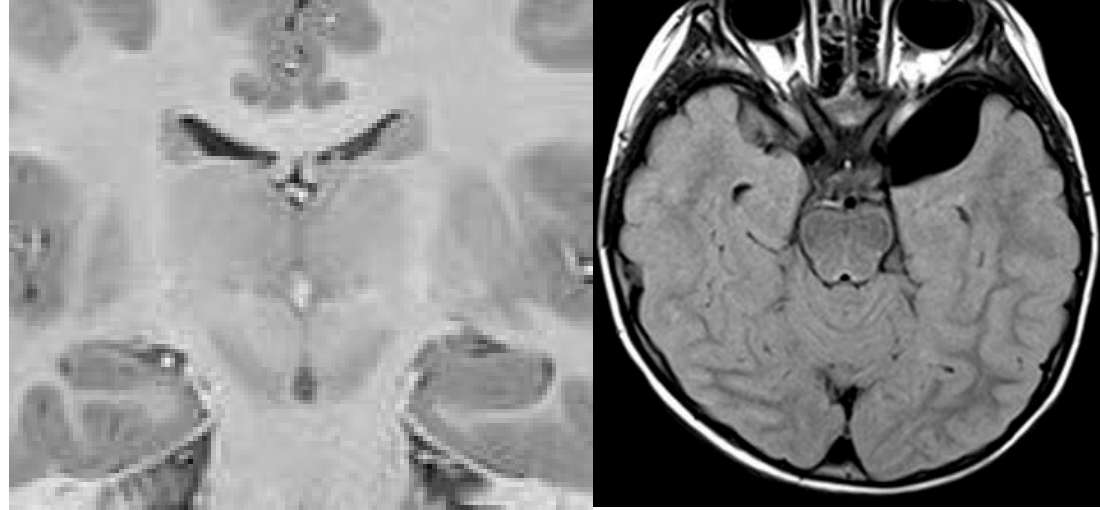
Malrotation des hippocampes

- Arrêt de l'inversion hippocampique (10-20 SA)
- Forme ronde ou pyramidale, médial, verticalisation sillon collatéral
- Plus fréquente en cas d'épilepsie, unilatéral (G) ou bilatéral
- 18% témoins, 30% épilepsie, pas de lien avec l'épilepsie temporale (Bajic 2009)
- 64% des malformations cérébrales (Sato 2001).





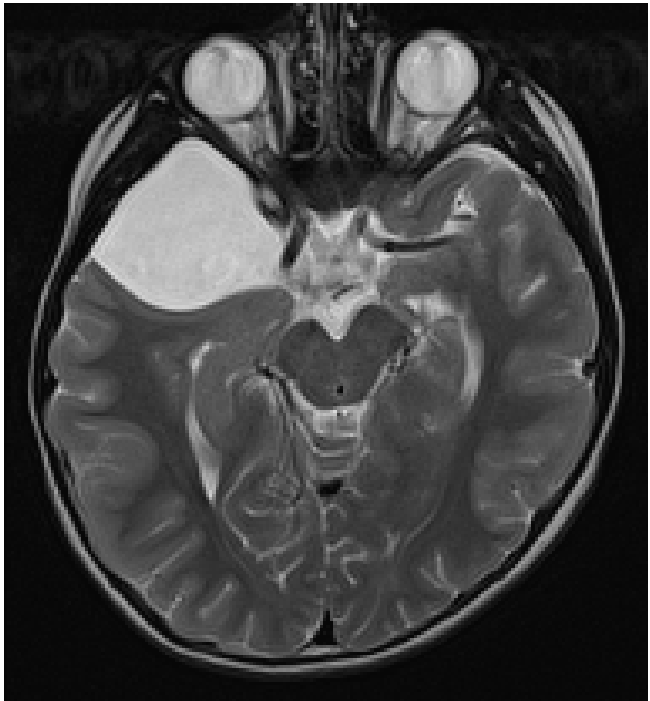
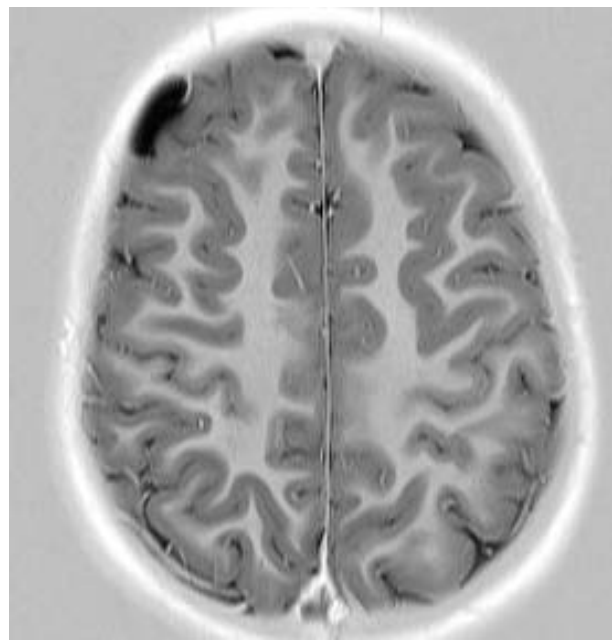
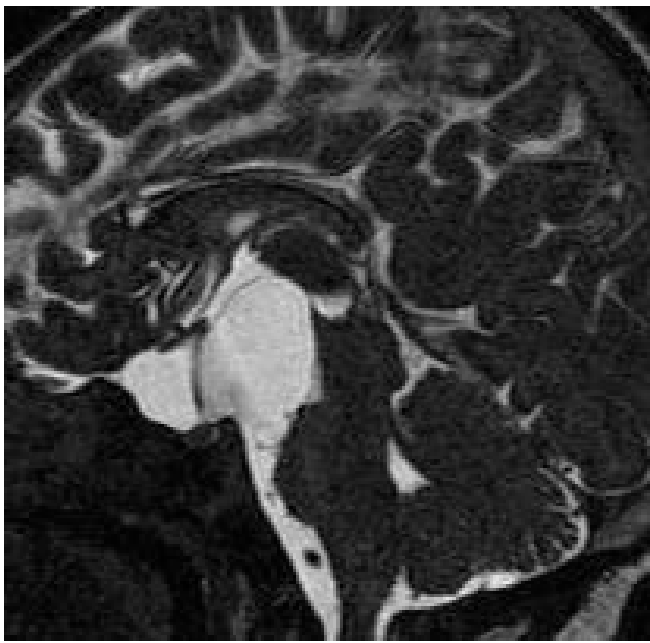
Kystes arachnoïdiens

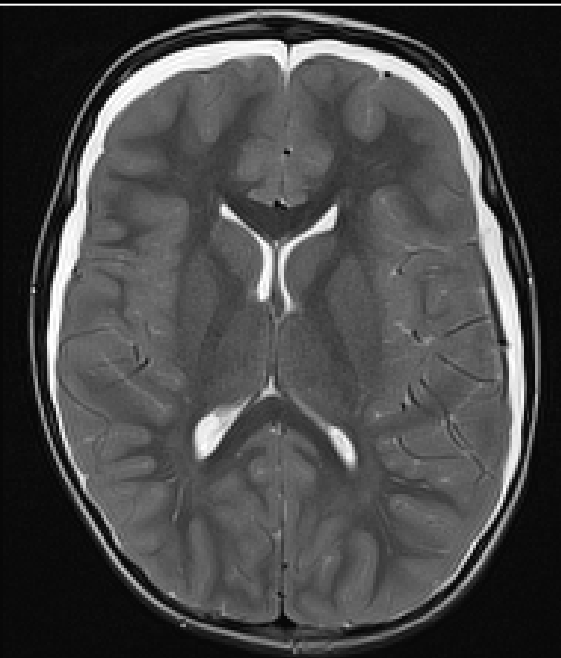
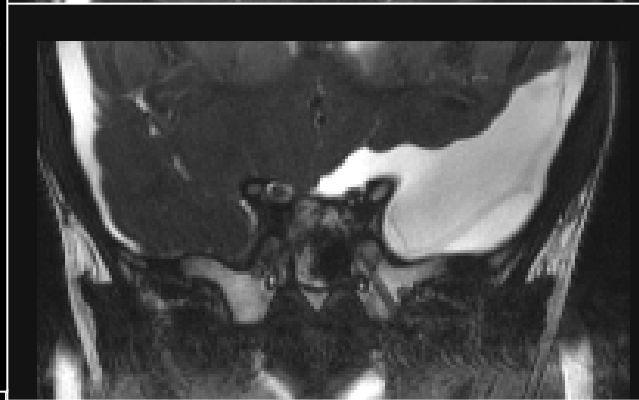
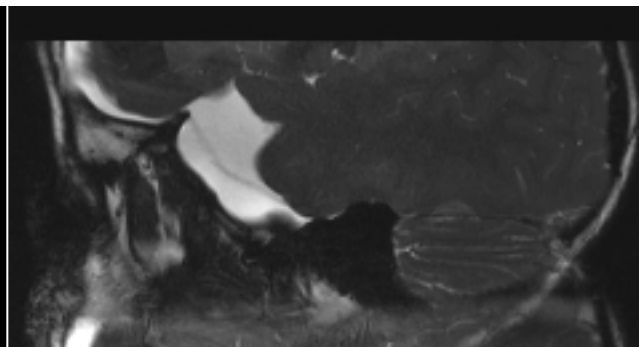
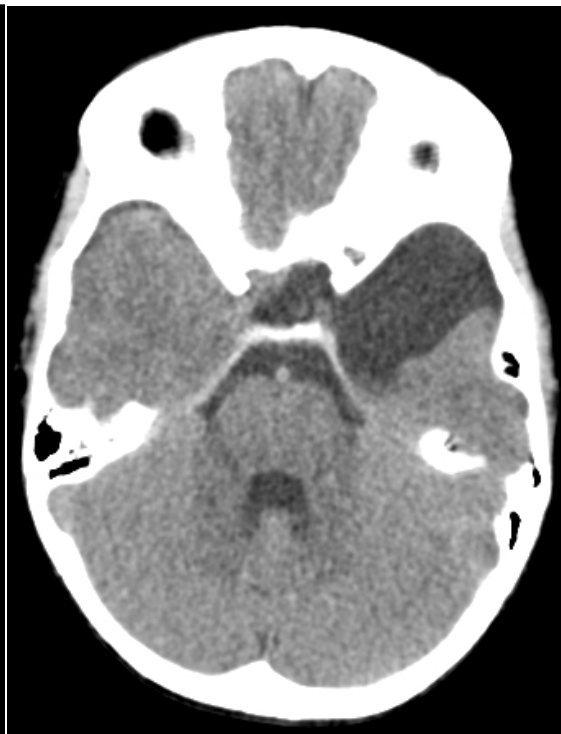
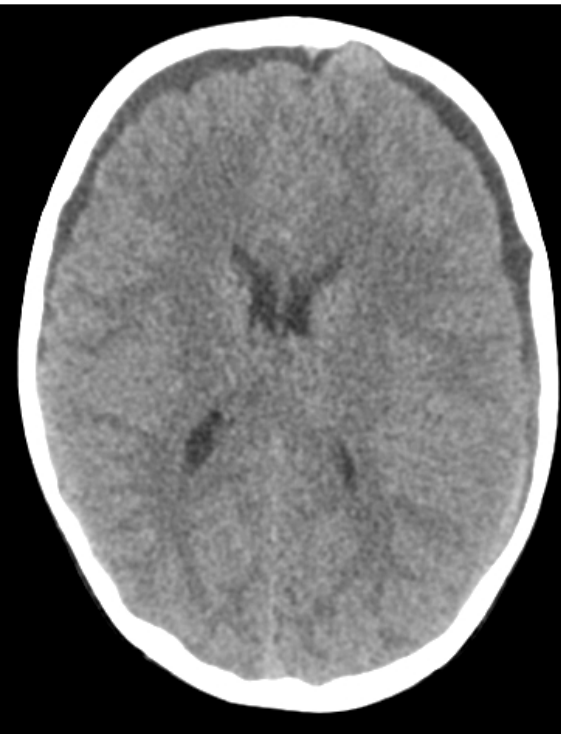


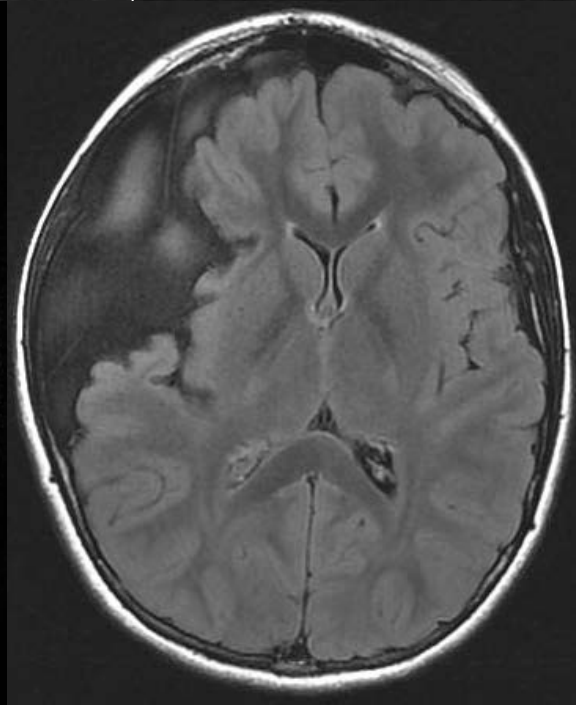
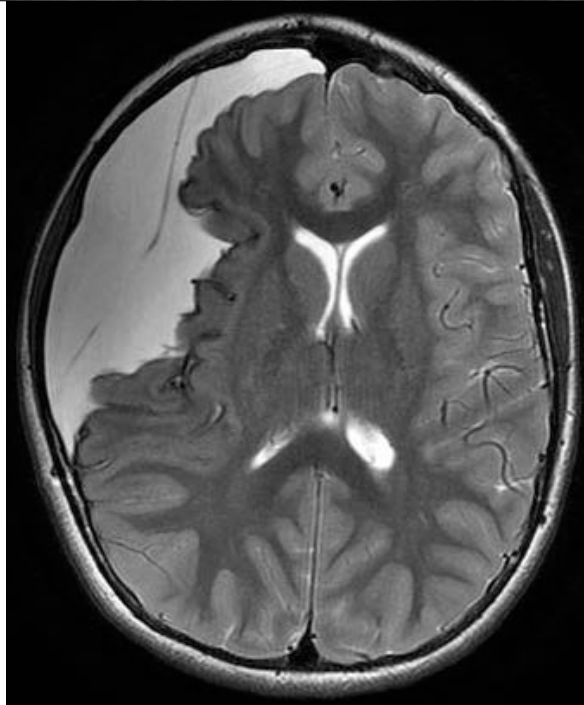
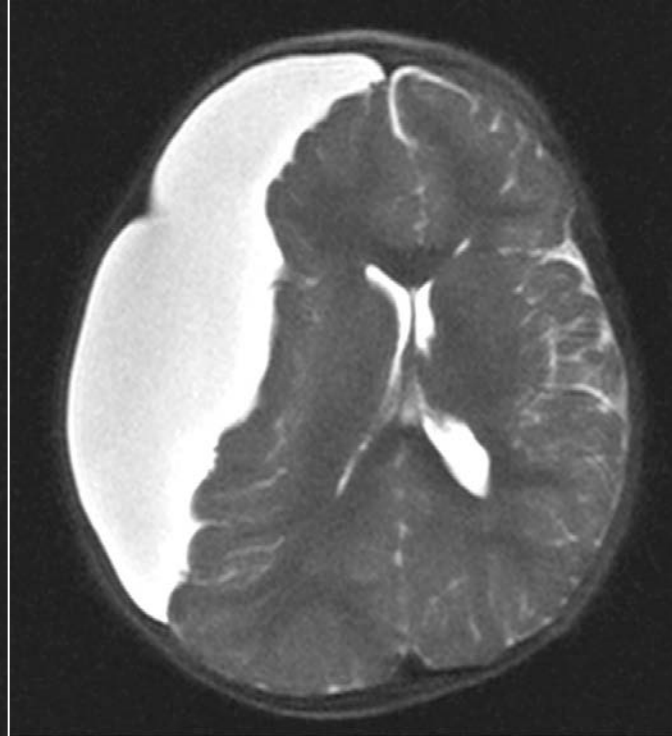
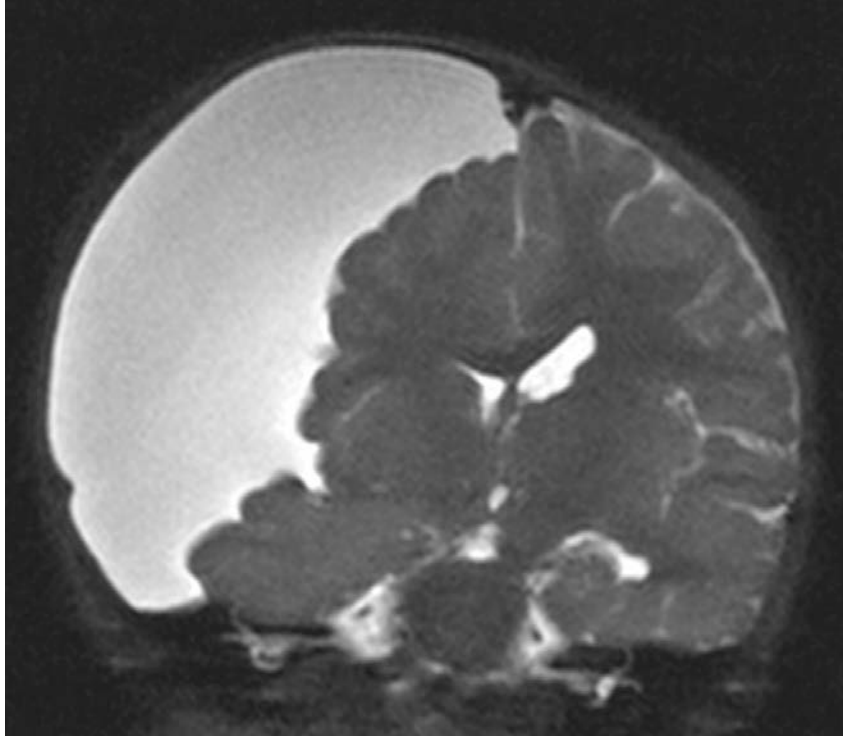
- Incidence 2,6%, garçon x2, pic de prévalence à 1 (3,8%) et 5 ans (4,6%), âge moy 3,5 ans
- **Fosse cérébrale moyenne** (50%), citerne quadri, **rétrrocérébelleux**, pontocérébelleux, sellaire, convexité
- Latéraux (fosse cereb moy, convexité) : rarement symptomatiques, rupture/Hie (5-25a, G)
- Ligne médiane, suprasellaire : hydrocéphalie, troubles visuels, endocriniens.
- Stables, disparition spontanée, augmentation taille (<4a).

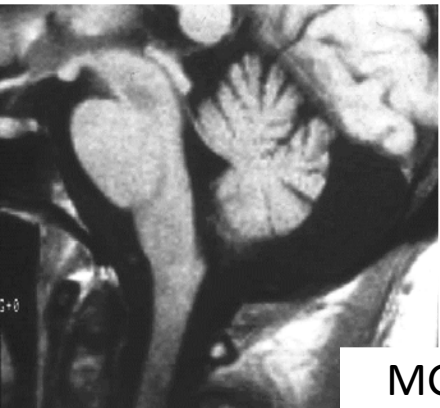
Prevalence and natural history of arachnoid cysts in children.

Al-Holou WN, Yew AY, Boomsaad ZE, et al. J Neurosurg Pediatrics 2010





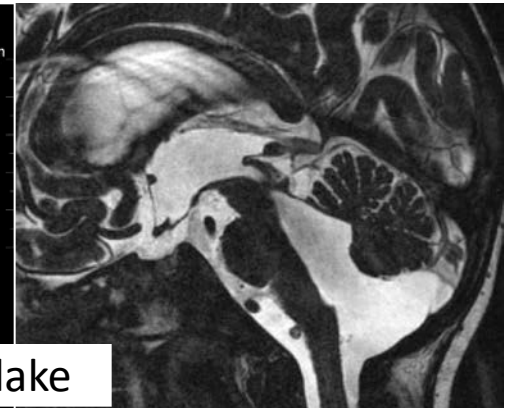




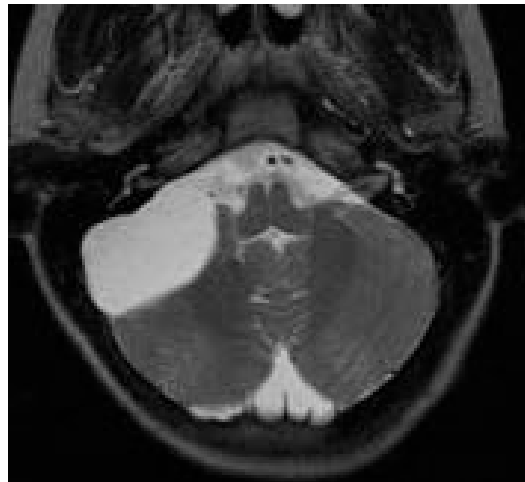
MGC



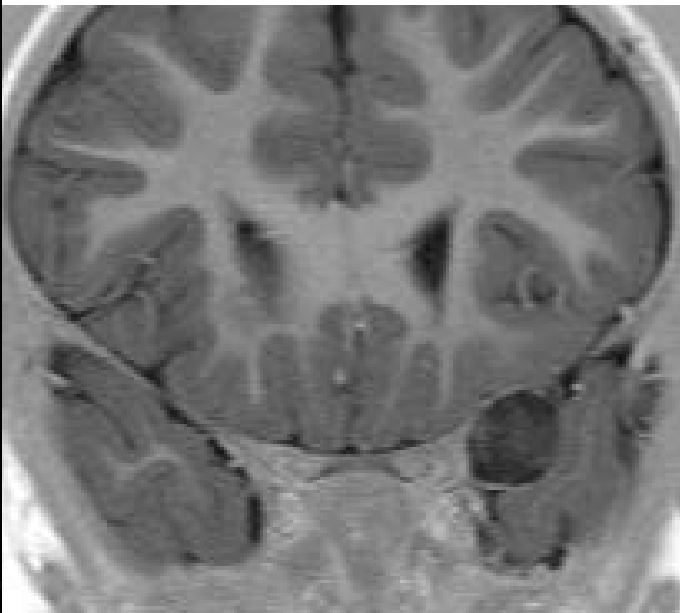
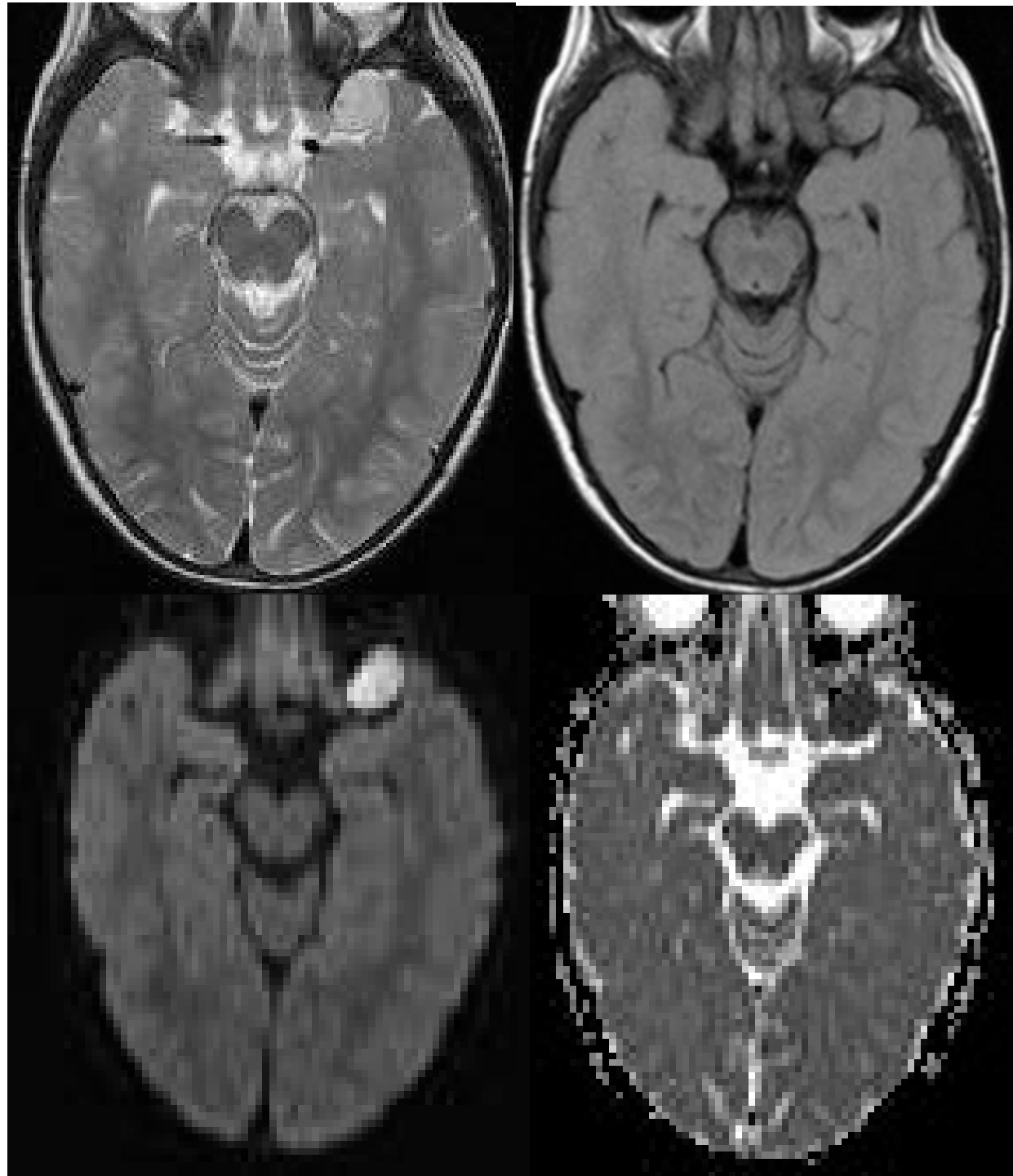
Blake



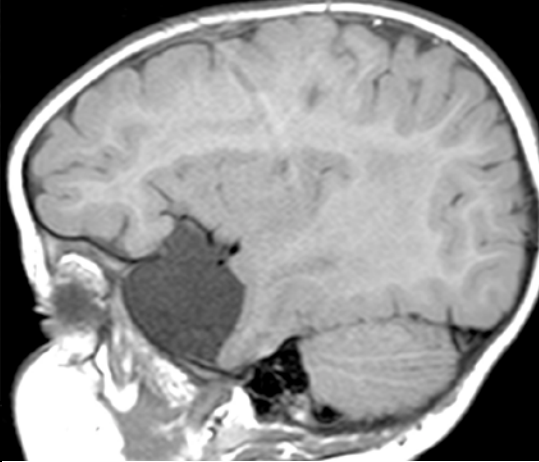
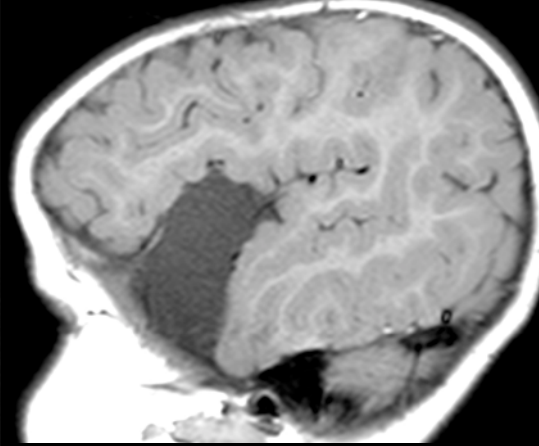
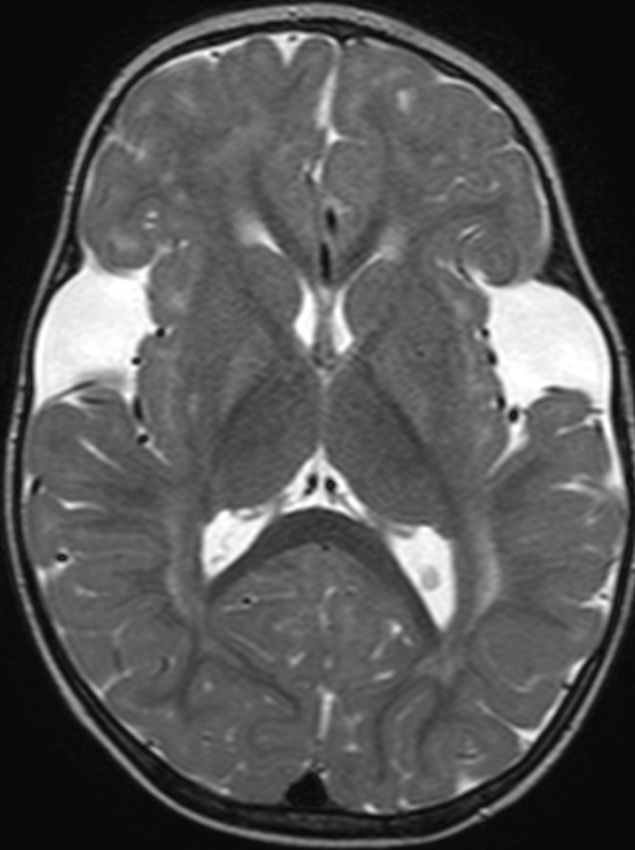
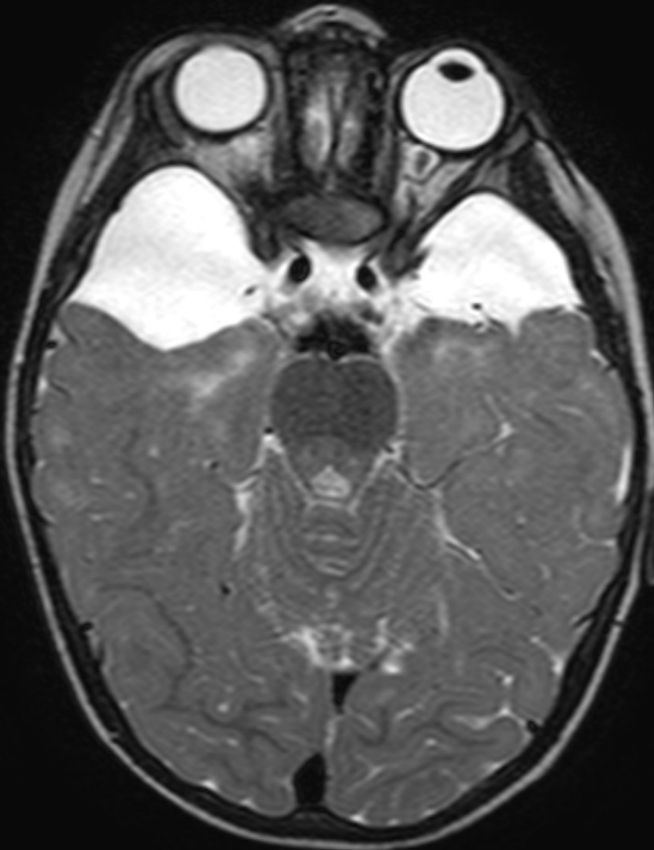
KA communicant



KA non communicant

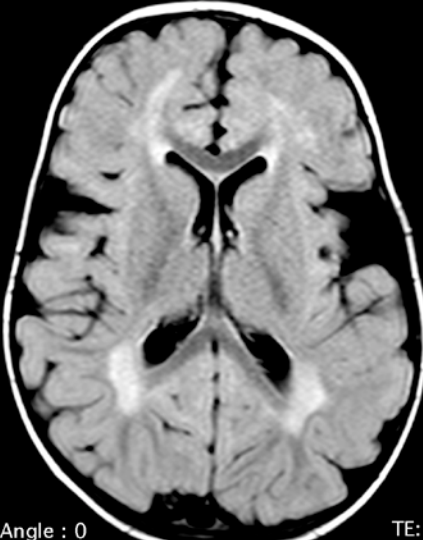
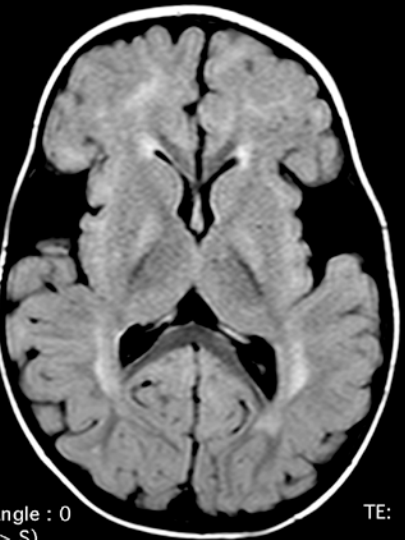


**Kyste
épidermoïde**



F: 1168

A1



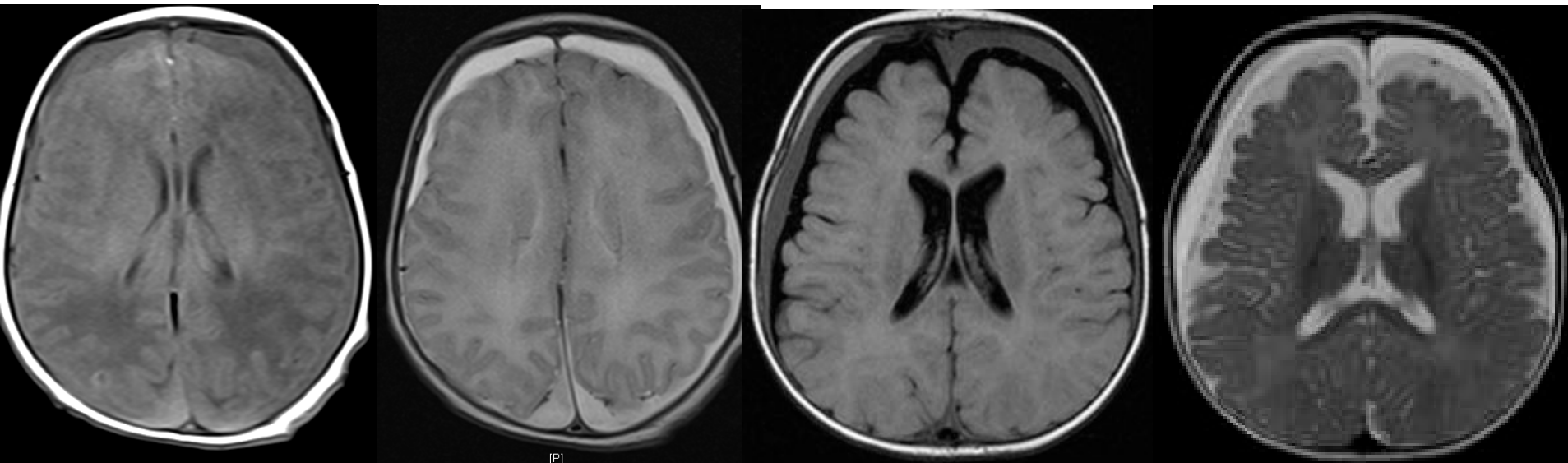
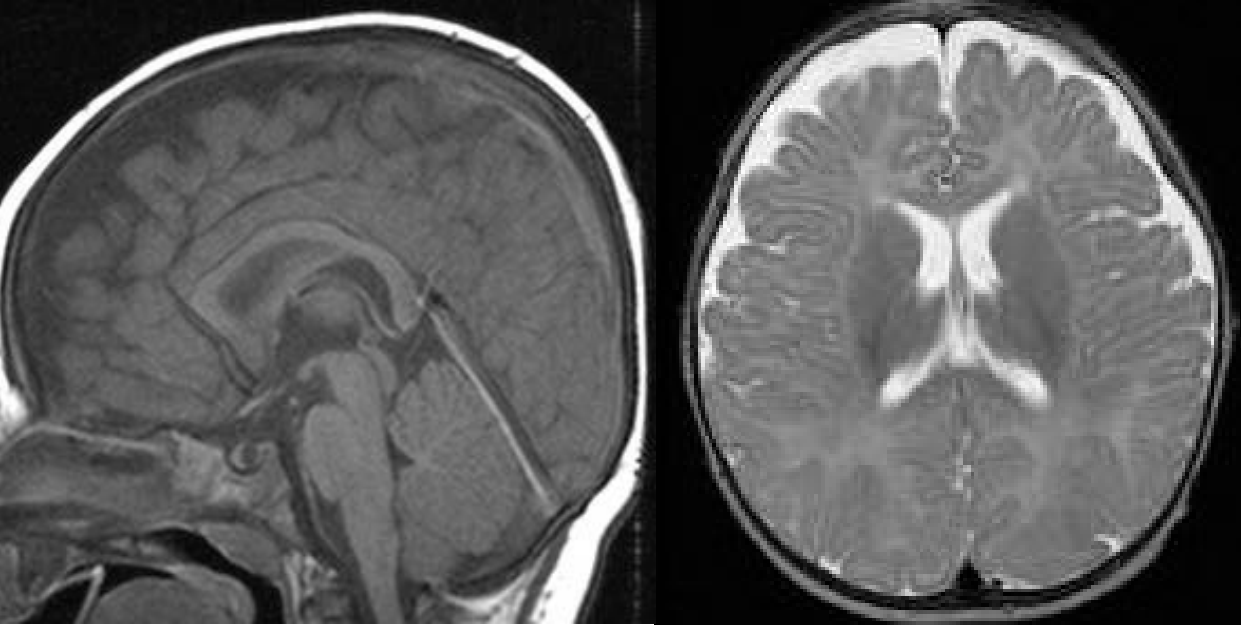
Angle: 0
1 -> S)

TE: 1
% Angle: 0
(1 -> S)

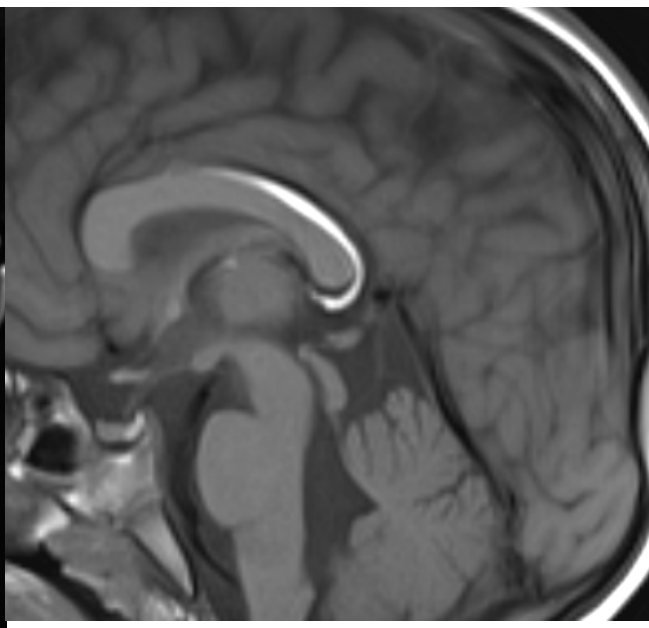
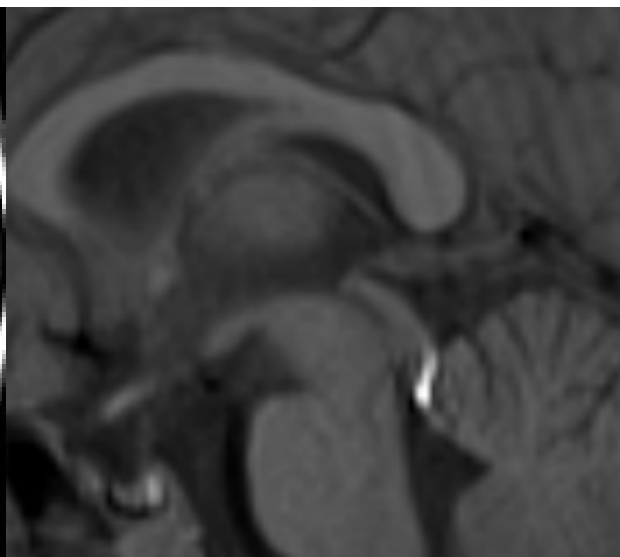
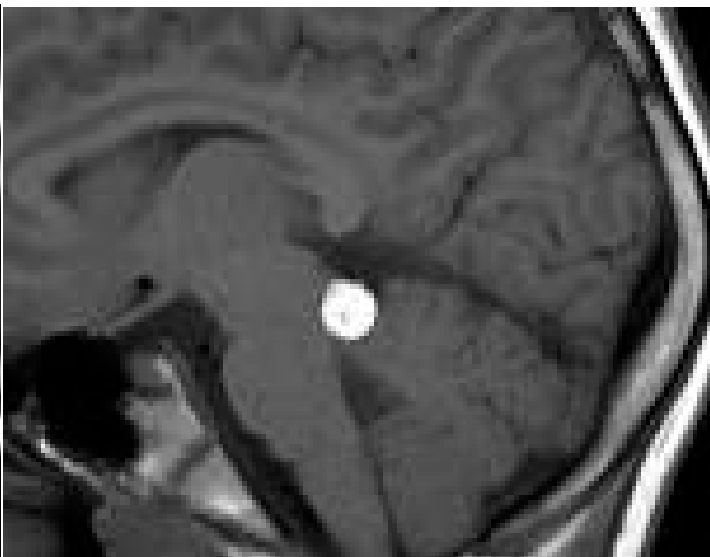
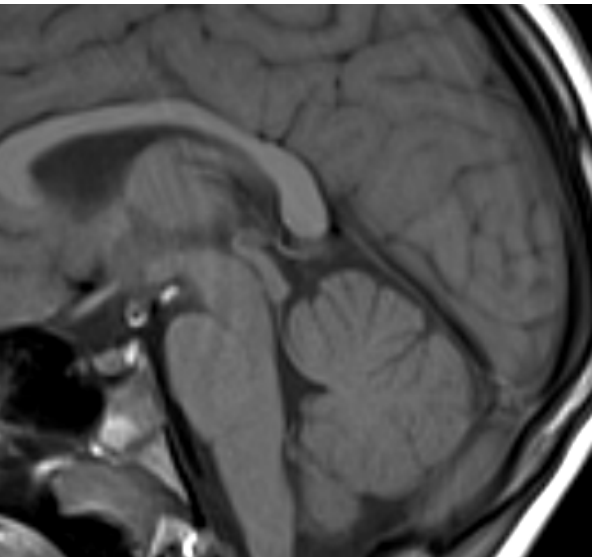
78% Angle: 0
TE: 140 (1 -> S)

TE: 70.5
15/10/20

**Acidurie glutarique
type 1**



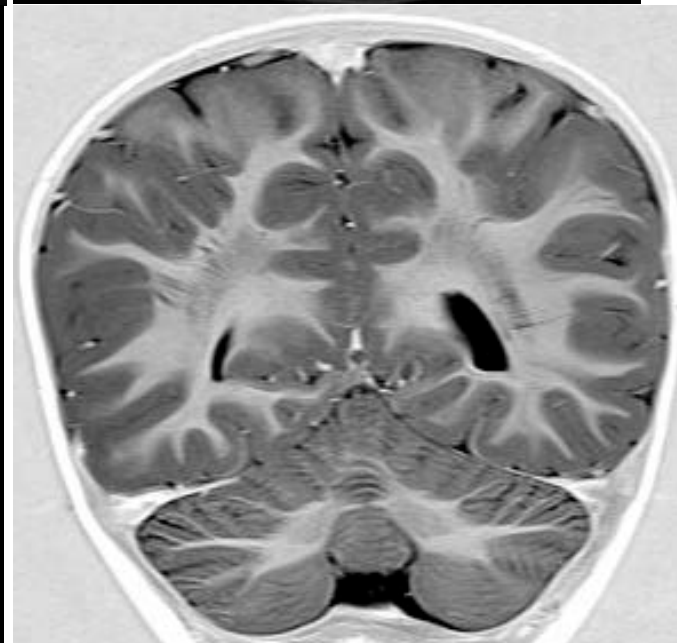
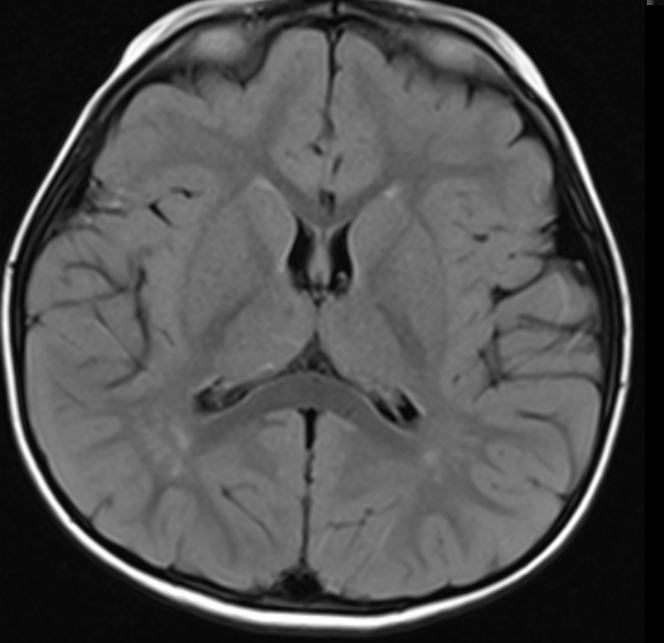
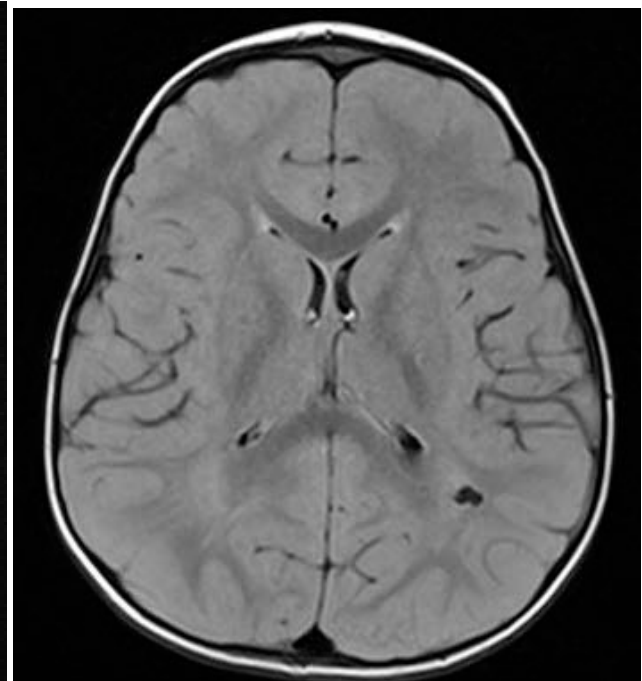
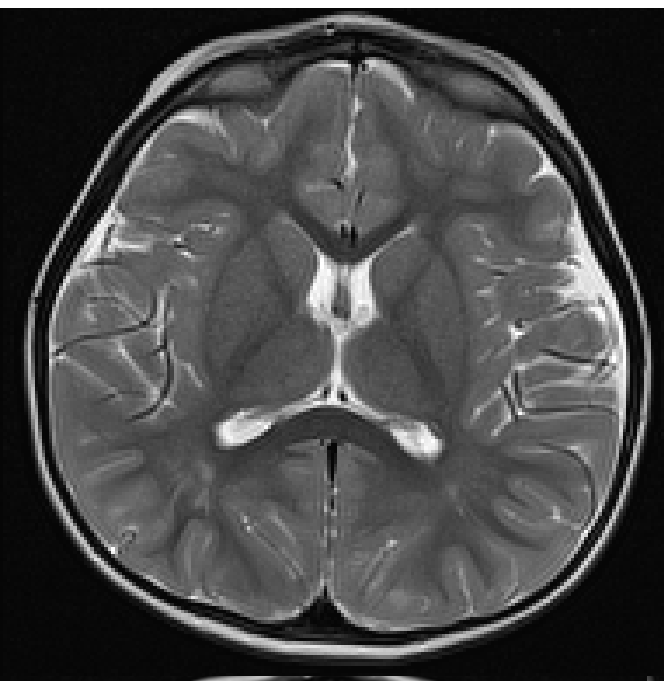
Subdural hemorrhage in pediatric patients with enlargement of the subarachnoid spaces.
McKeag H et al, J Neurosurg Ped 2013.

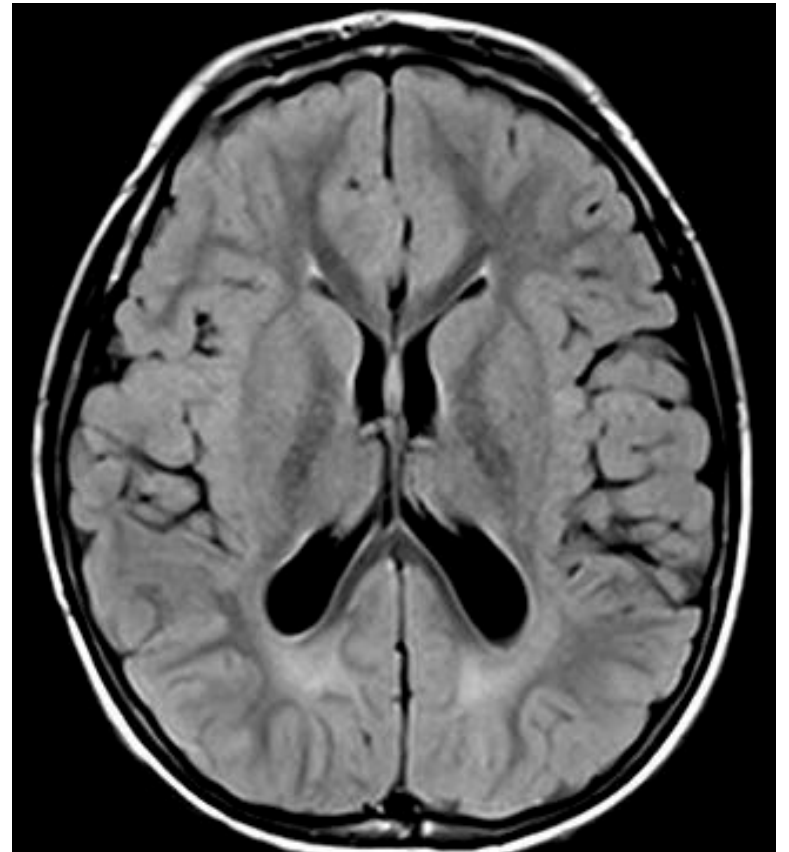
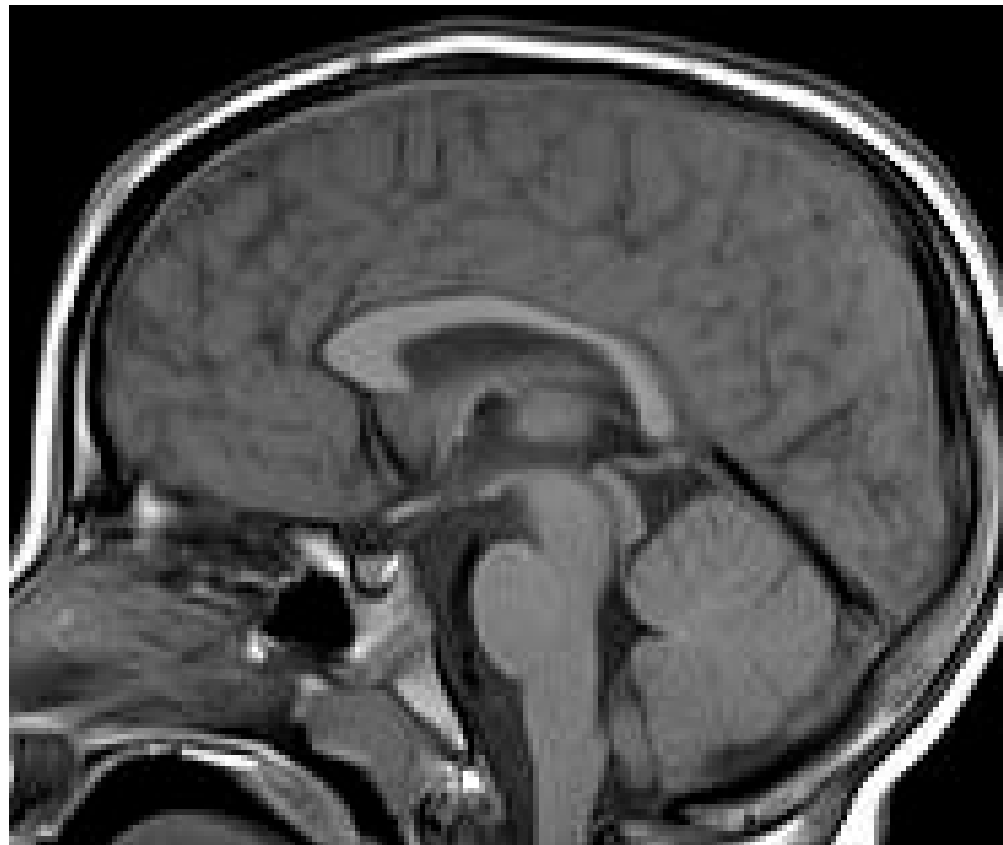


PARENCHYME

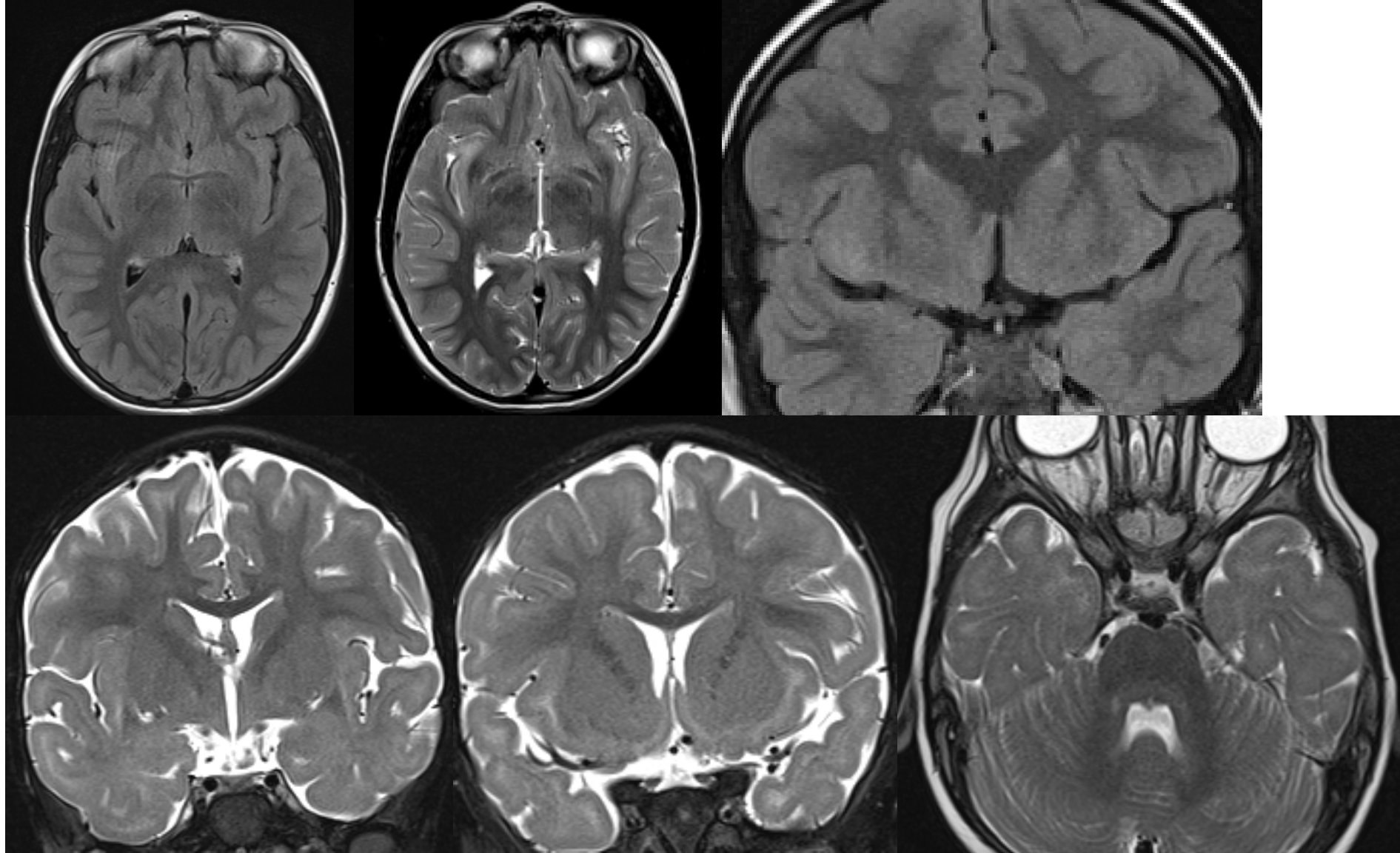
Virchow-Robin

- 80% des IRM cérébrales pédiatriques (Groeschel 2006)
- Normal, même si dilaté (1%).
- Coro TIR, moins visibles en FLAIR
- Pas de corrélation nombre/âge.
- Partie inf des NGC autour des vx lenticulostrés, SB profonde, mésencéphale, thalamus, cervelet, cortex subinsulaire, capsule extrême, voies optiques, noyaux dentelés, CC.

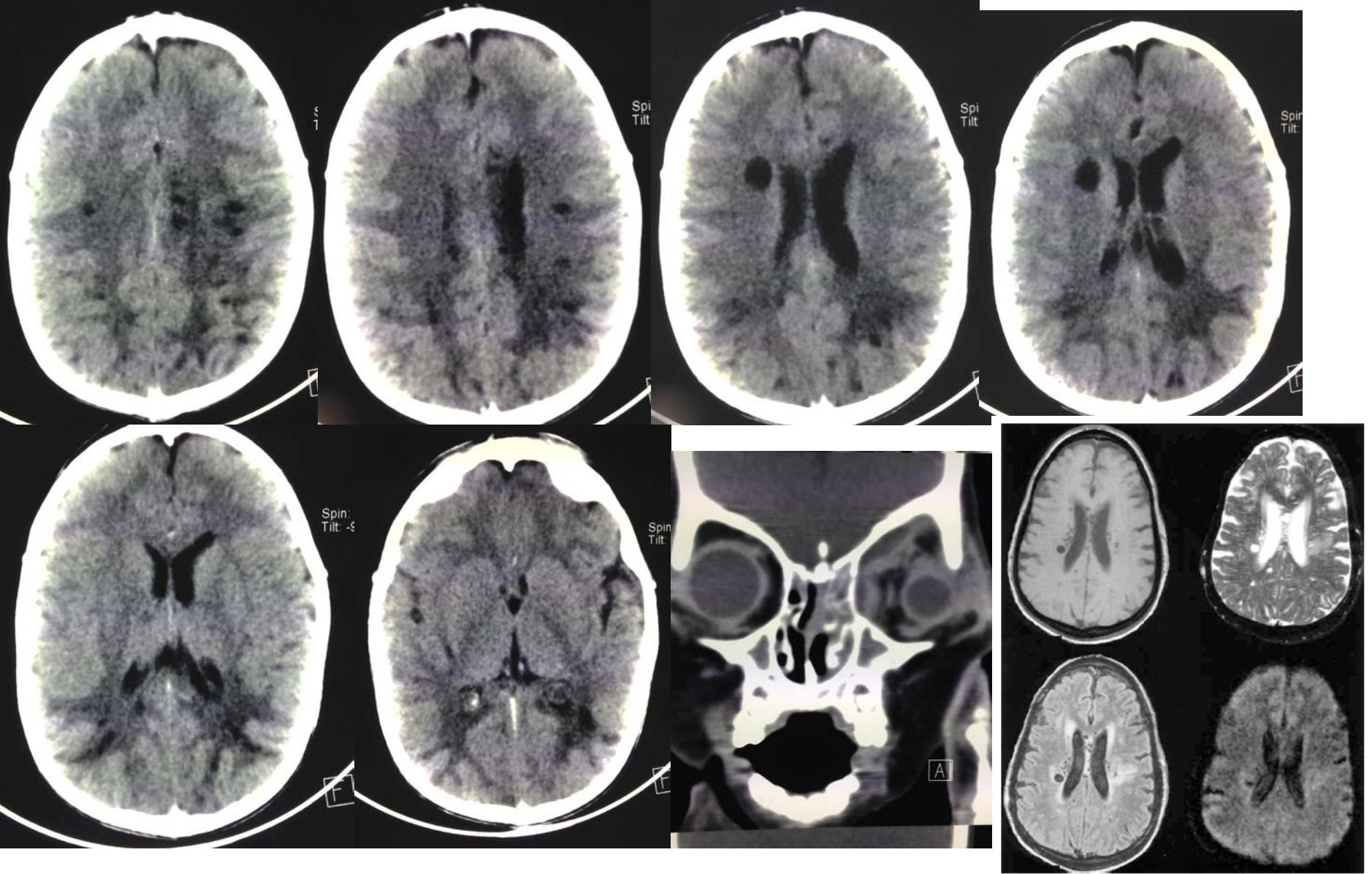




Ischémie



June Song- Radiology 2000-*MR Imaging and histologic features of subinsular bright spots on T2-weighted MR images: Virchow-Robin spaces of the extreme capsule and insular cortex.*



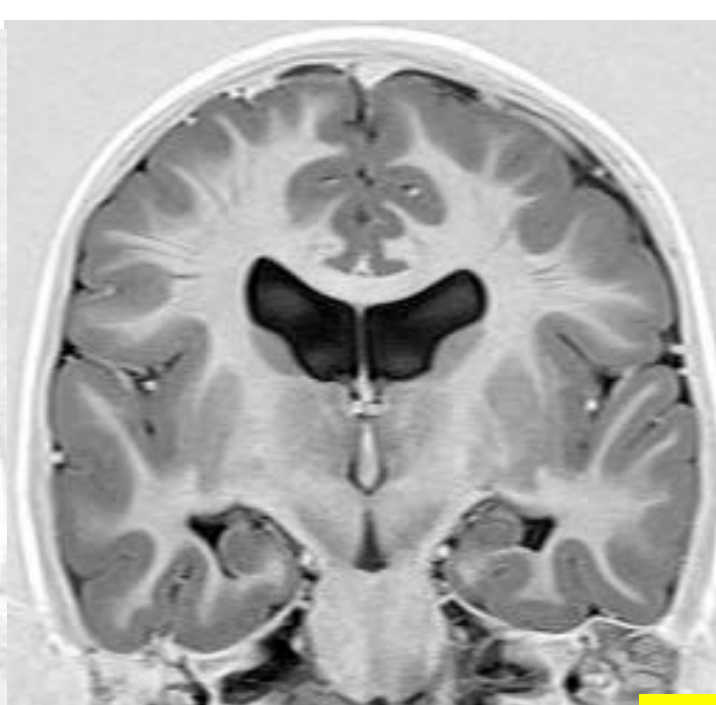
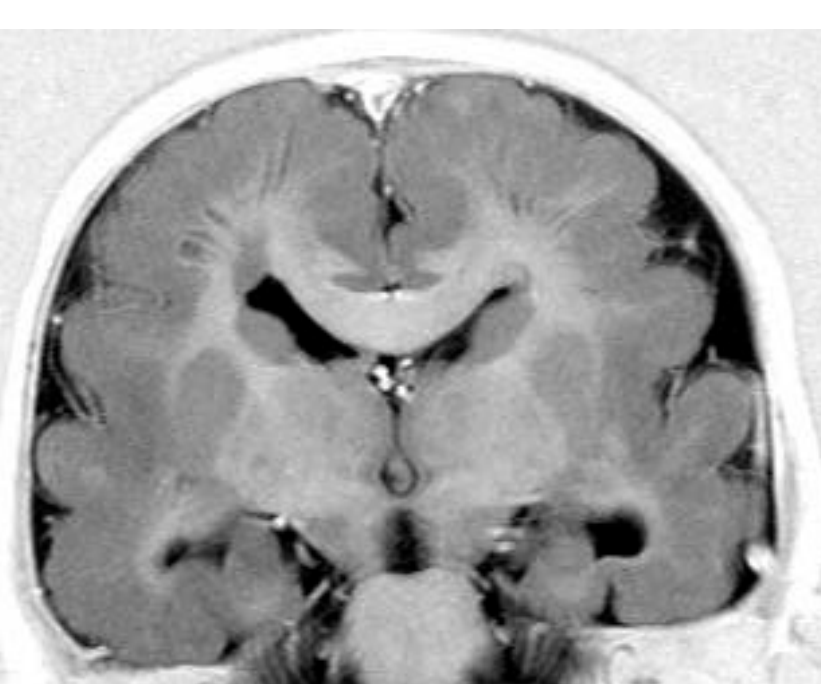
MPS type II-Mie de Hunter-3 ans

Neuroradiology (2004) 46: 666-672
 DOI 10.1007/s00234-004-1215-1

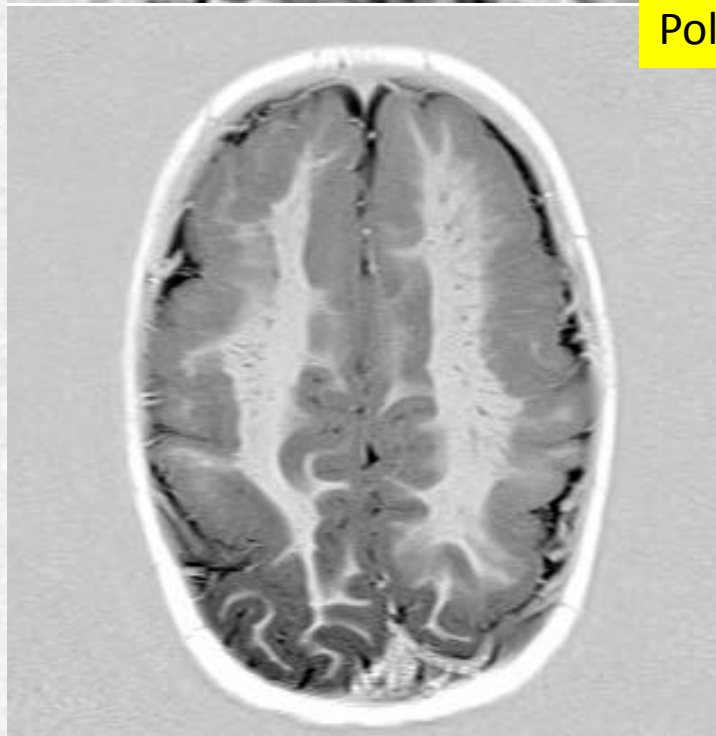
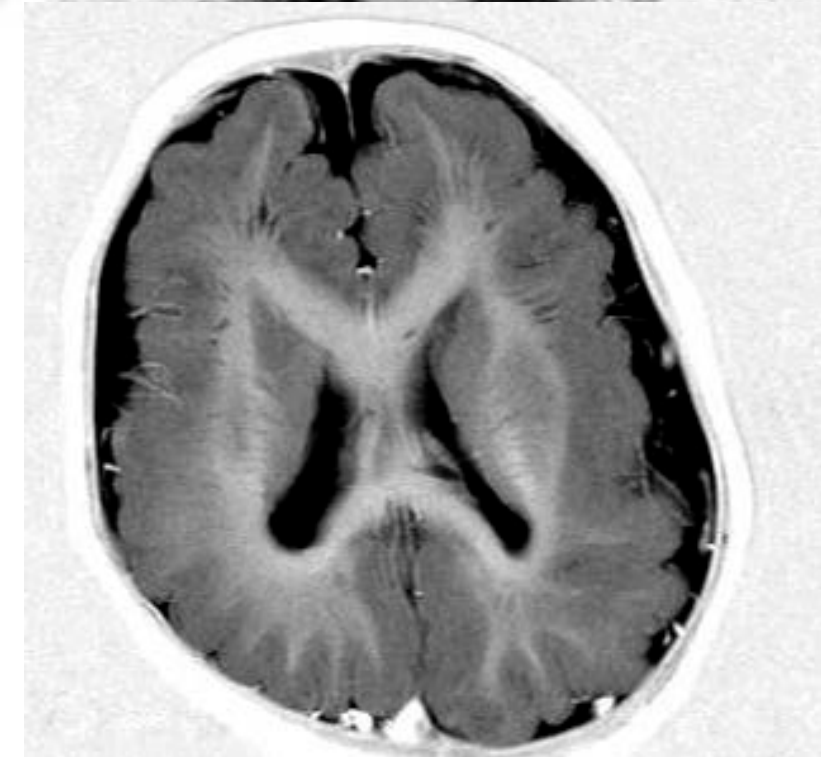
DIAGNOSTIC NEURORADIOLOGY

M. Gisele Mathews
 Mauricio Castillo
 J. Keith Smith
 Diane Armas
 Diane Towle
 Joseph Muenzer

Brain MRI findings in patients with mucopolysaccharidosis types I and II and mild clinical presentation

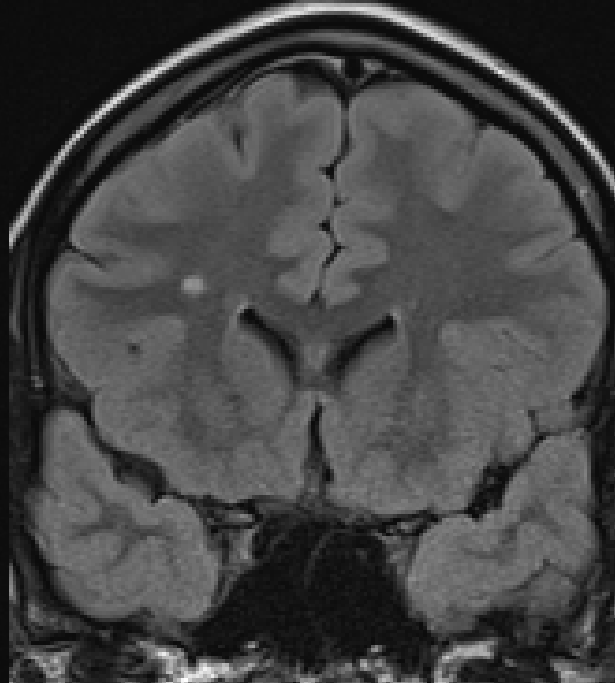
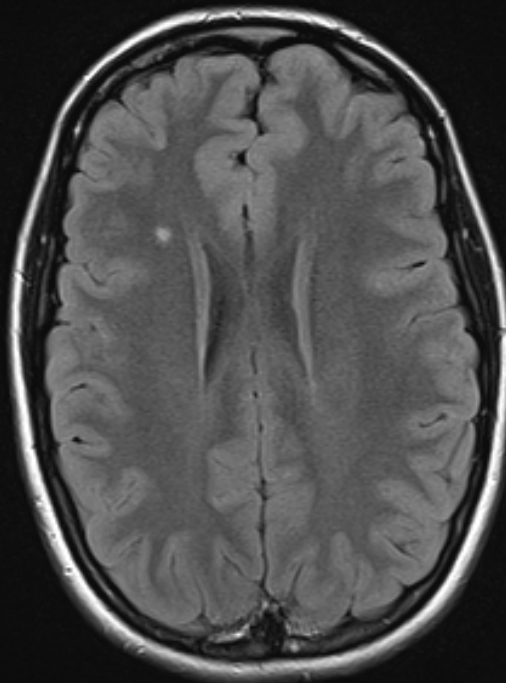
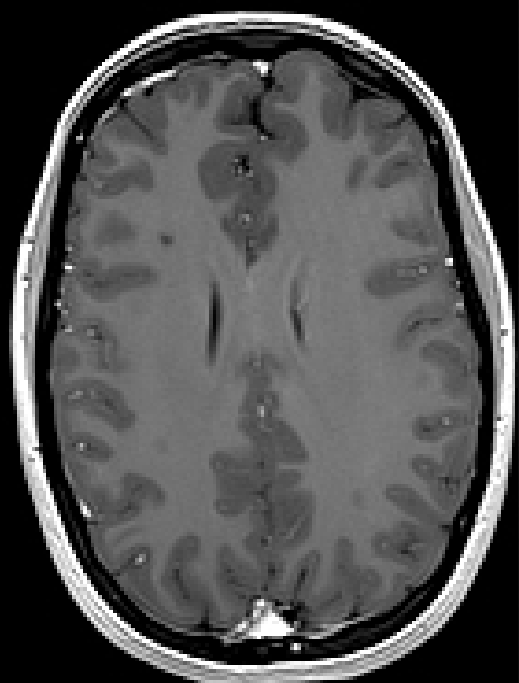
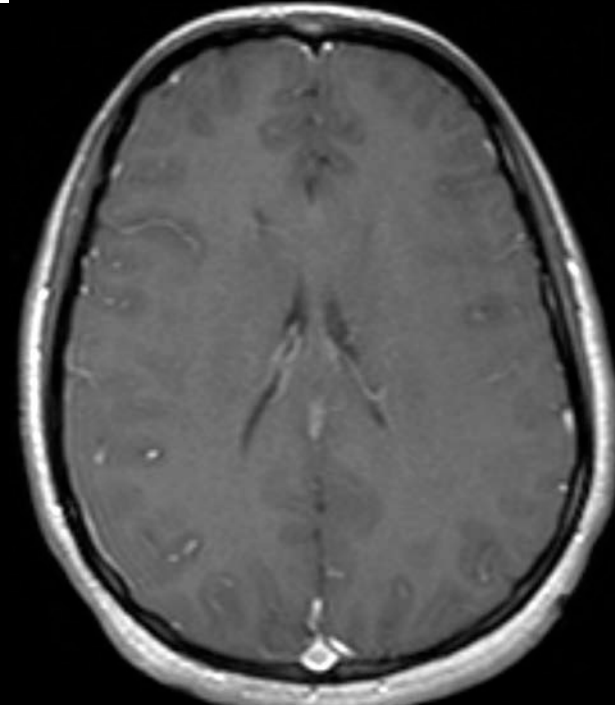
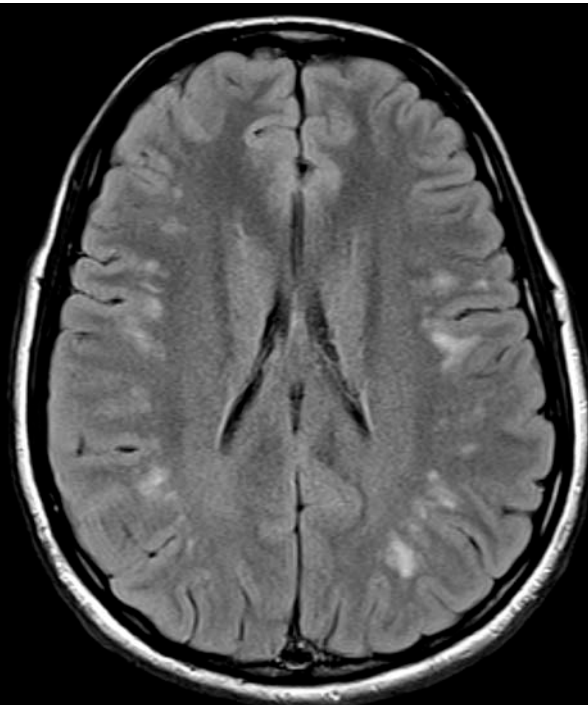
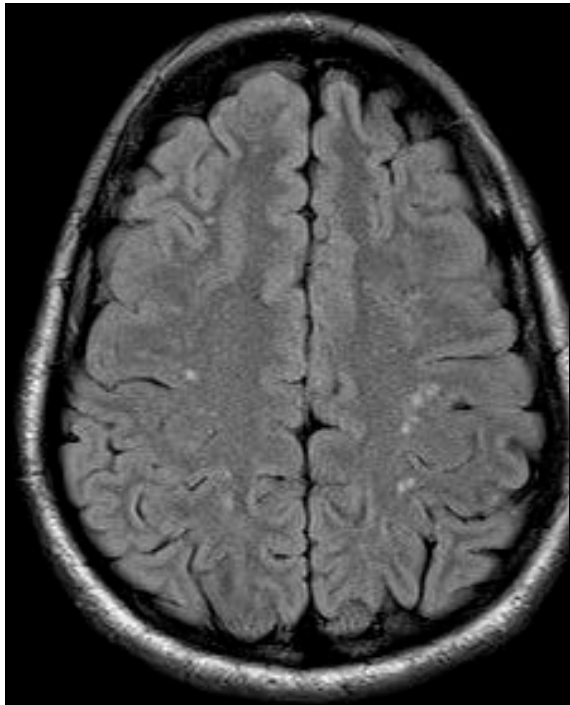


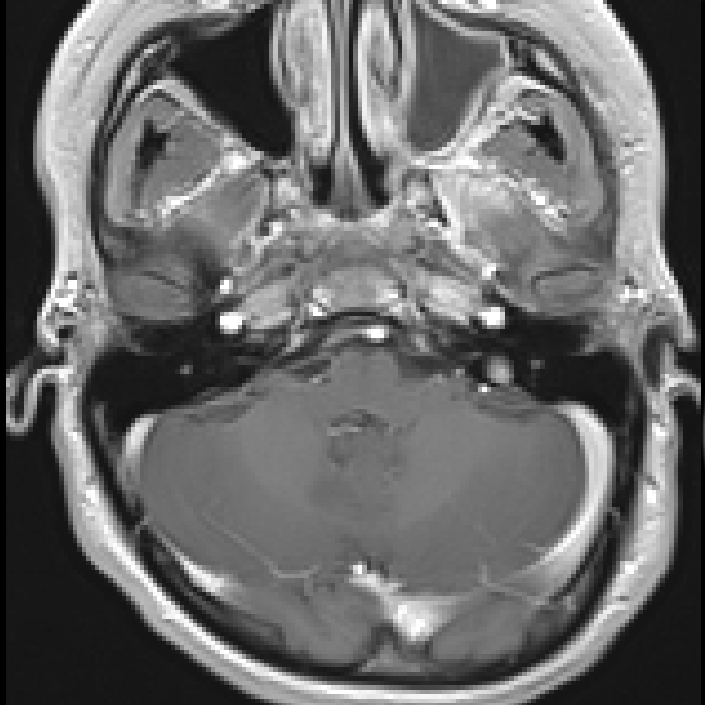
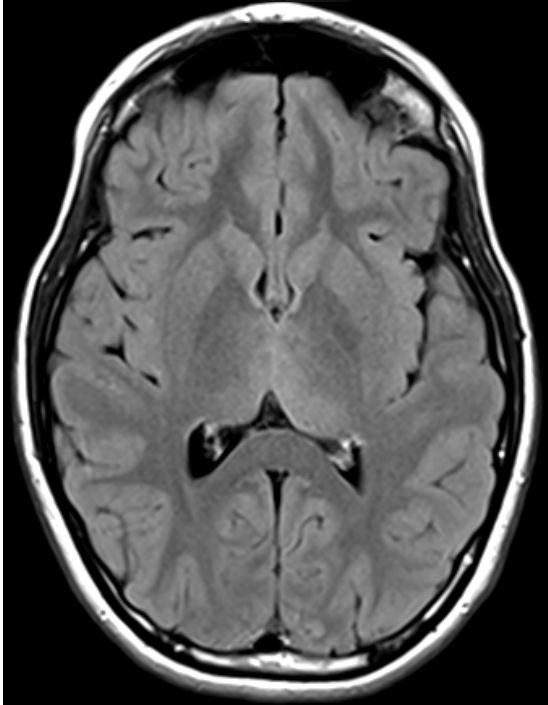
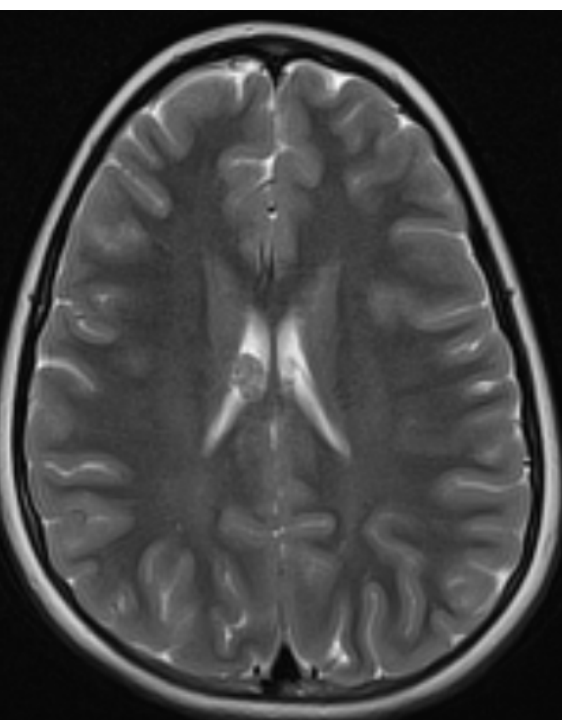
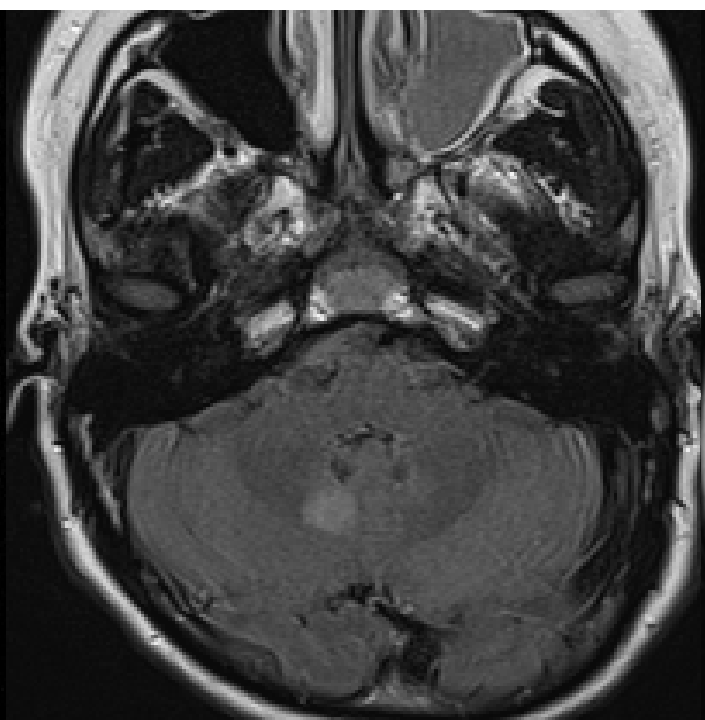
Polymicrogyrie



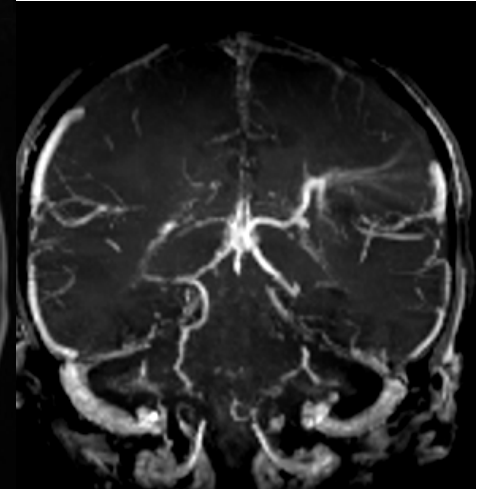
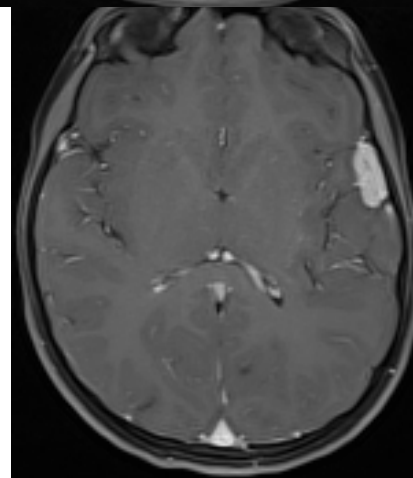
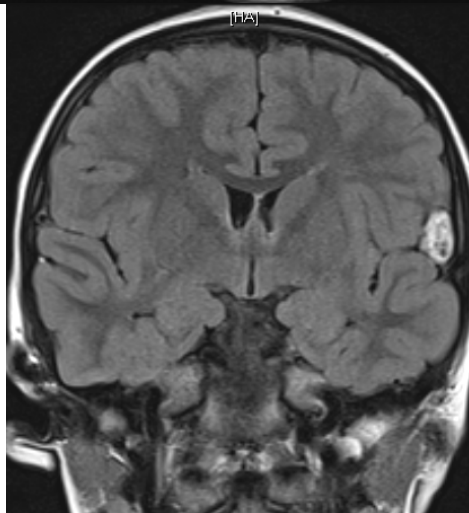
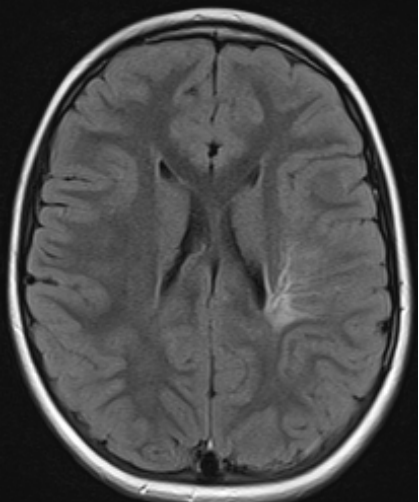
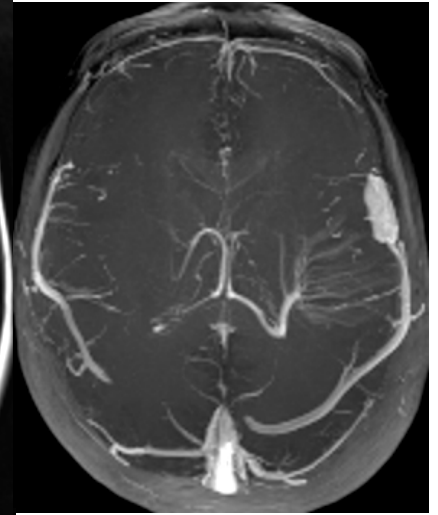
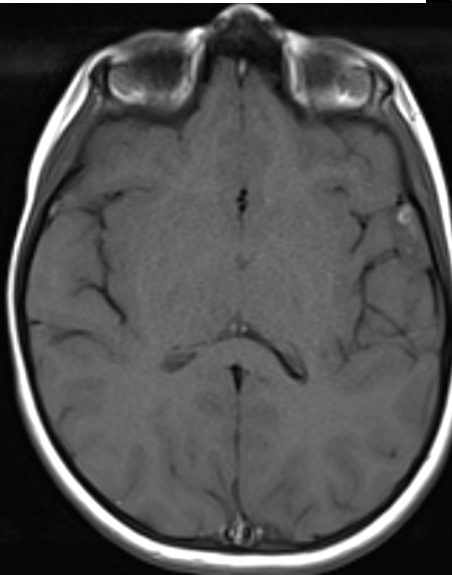
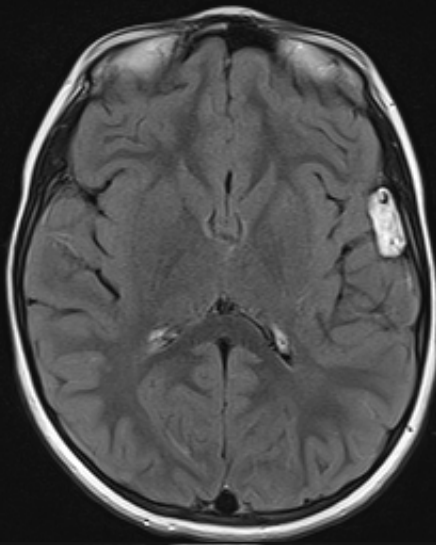
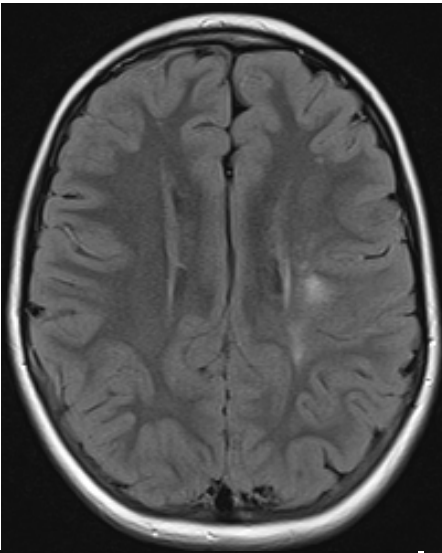
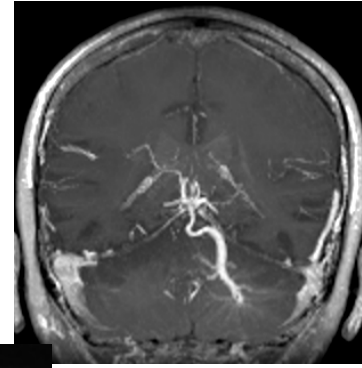
Autres lésions de la SB

- Lésions non spécifiques
- Hétérotopies de SG
- Tumeurs
- Lésions vasculaires

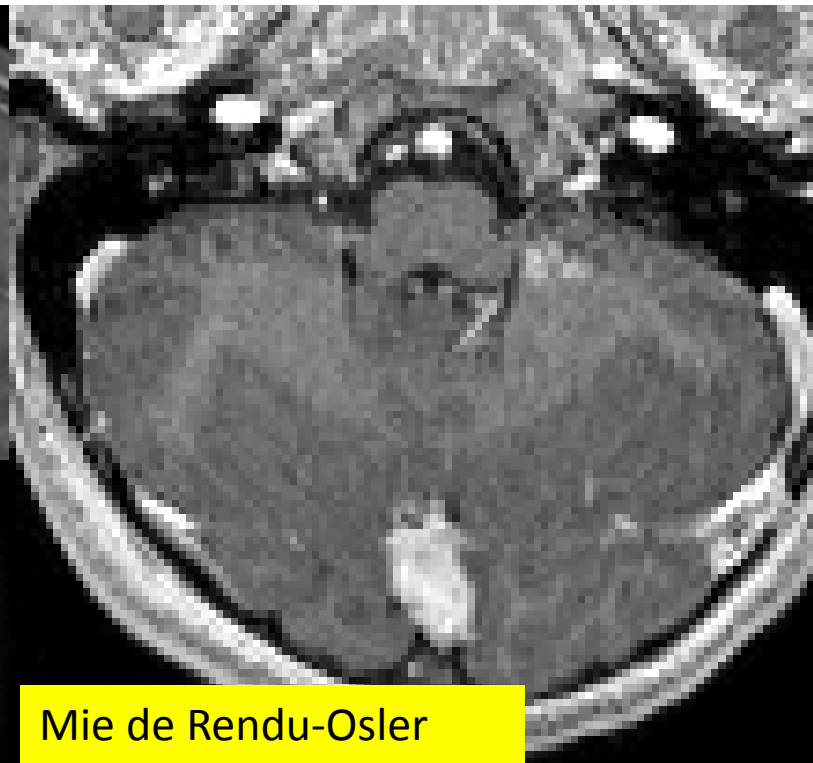
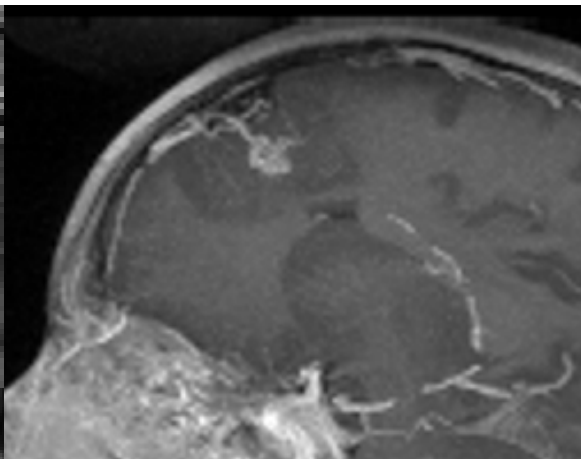
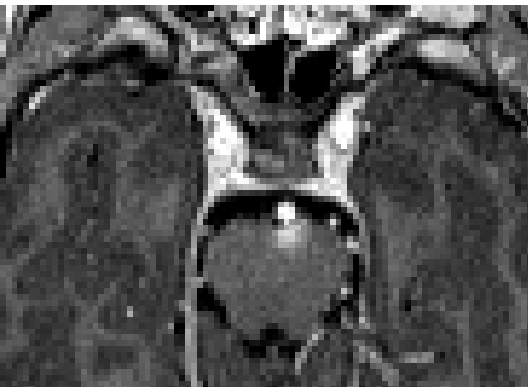
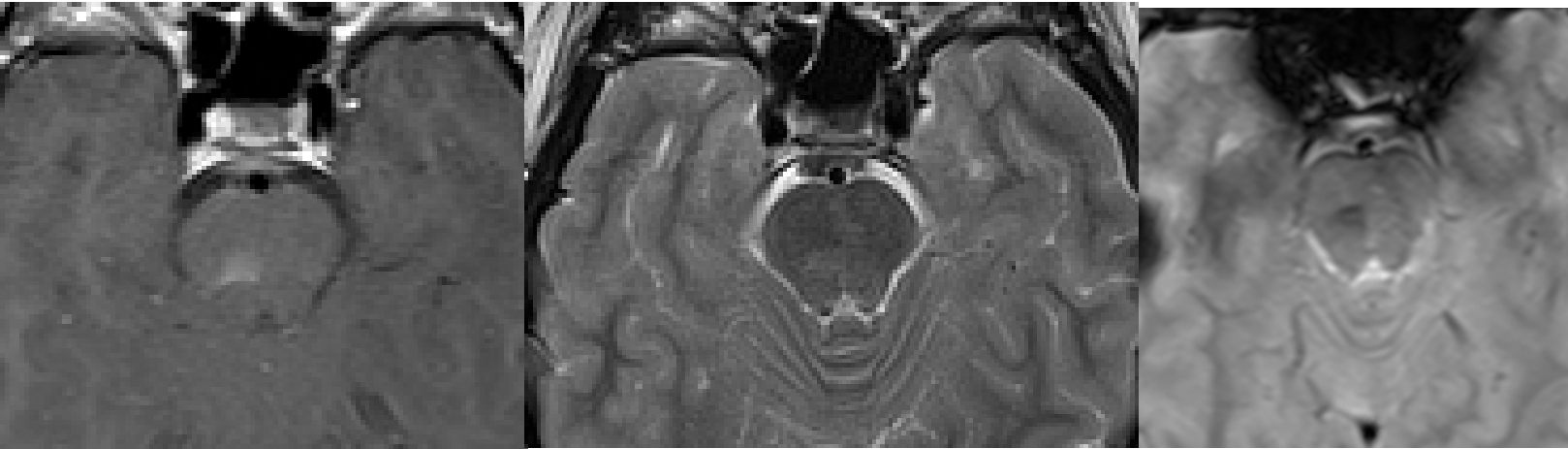




Anomalie veineuse de développement



Télangiectasie capillaire

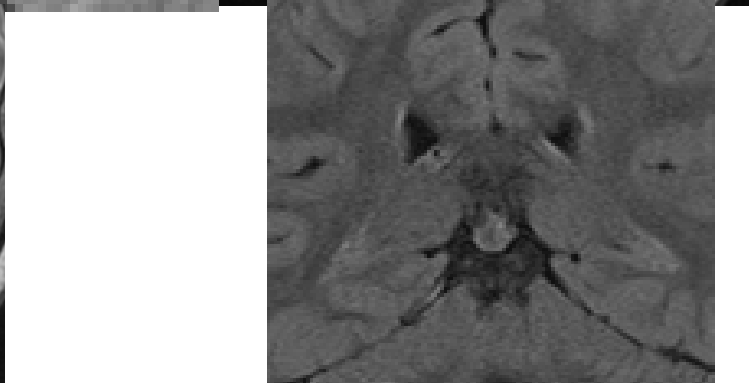
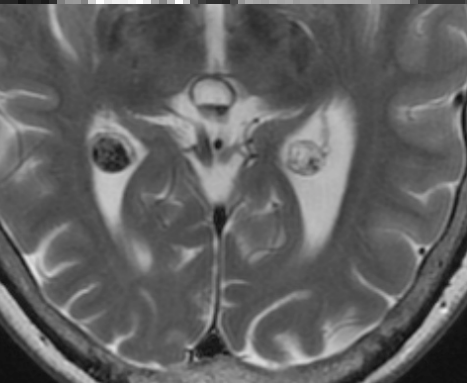
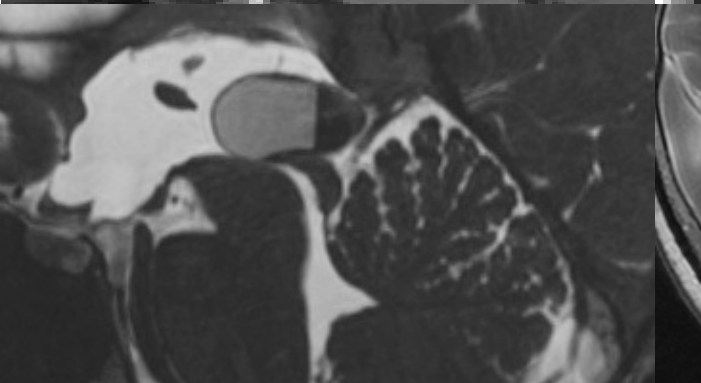
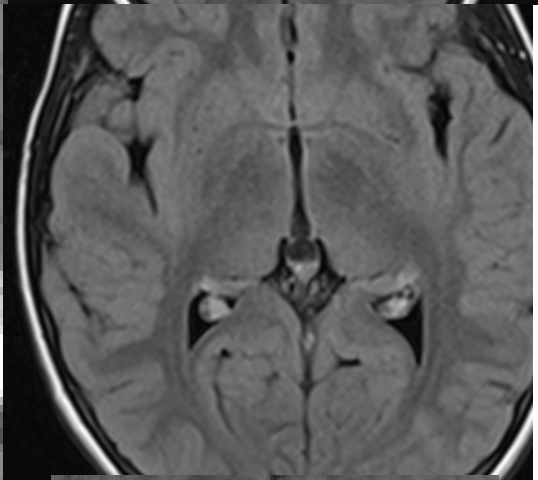
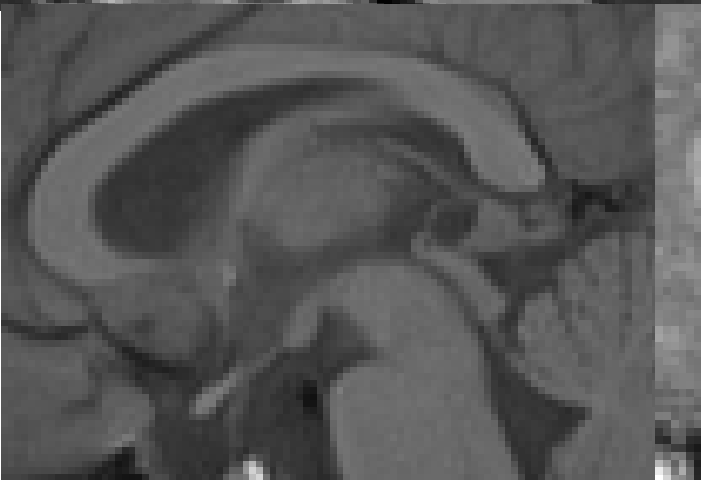
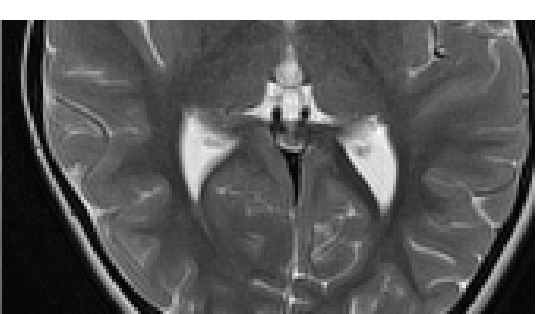
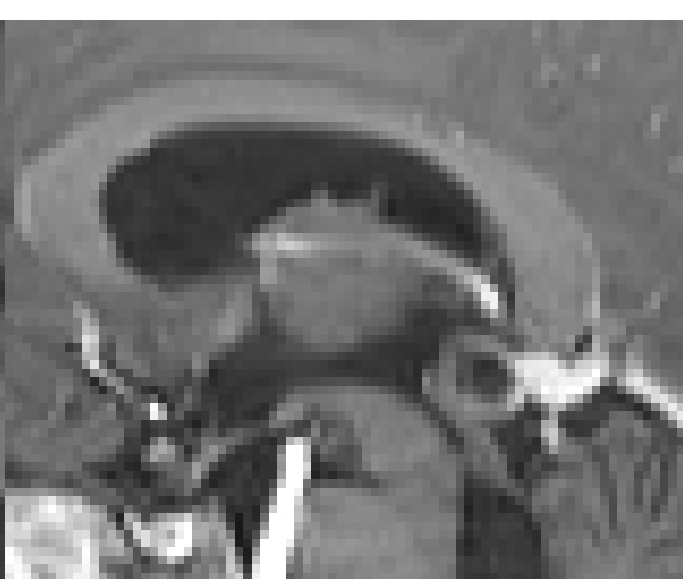
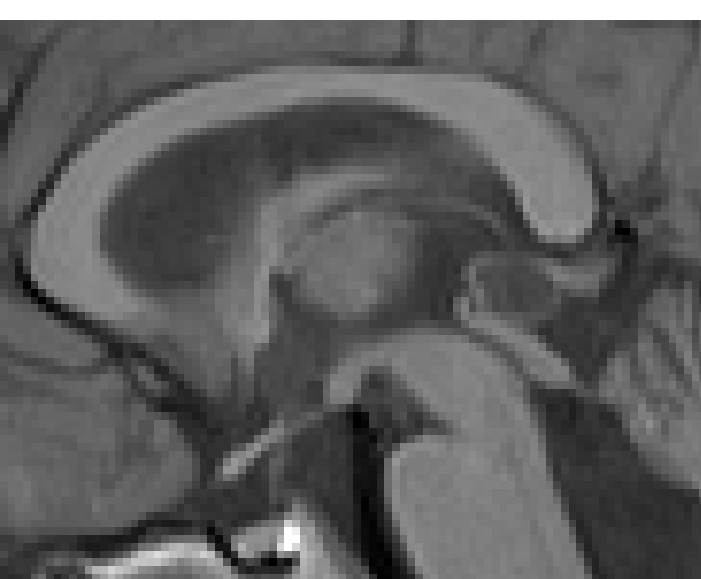


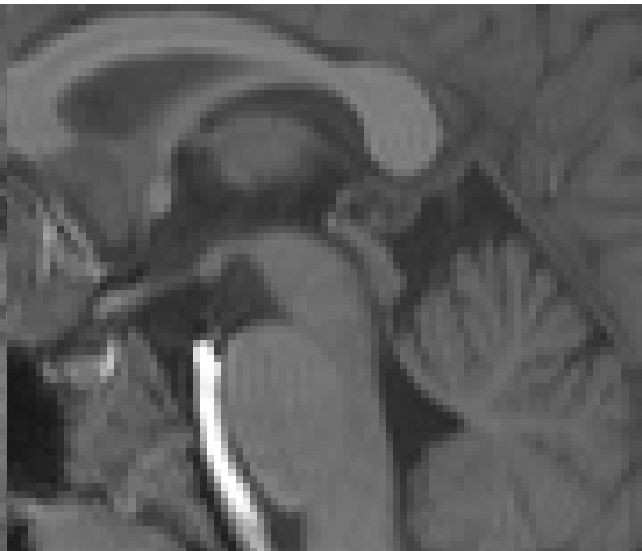
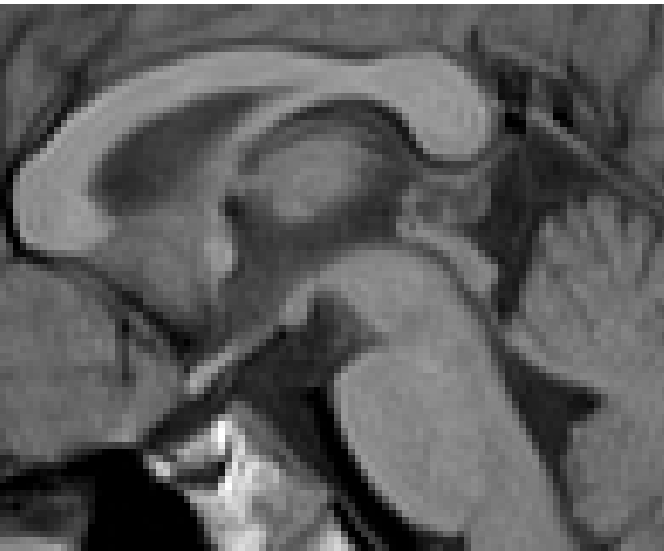
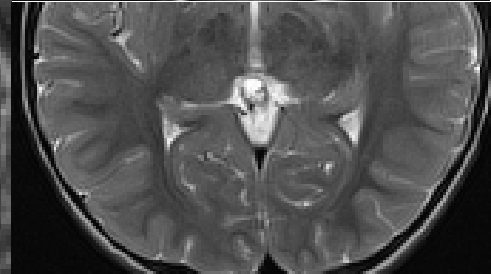
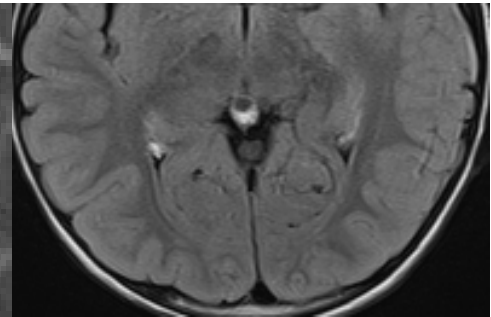
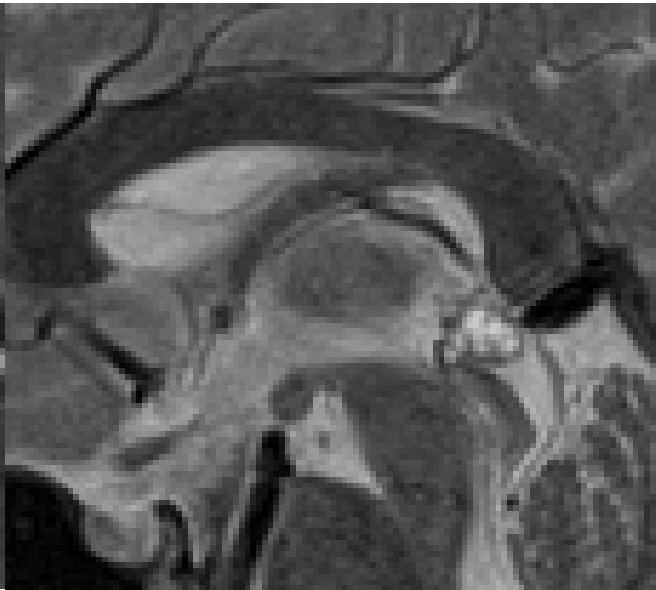
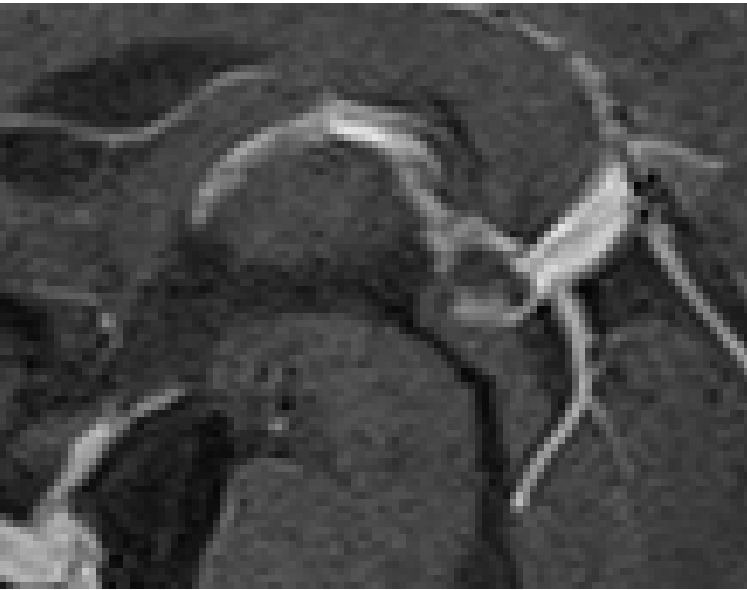
Mie de Rendu-Osler

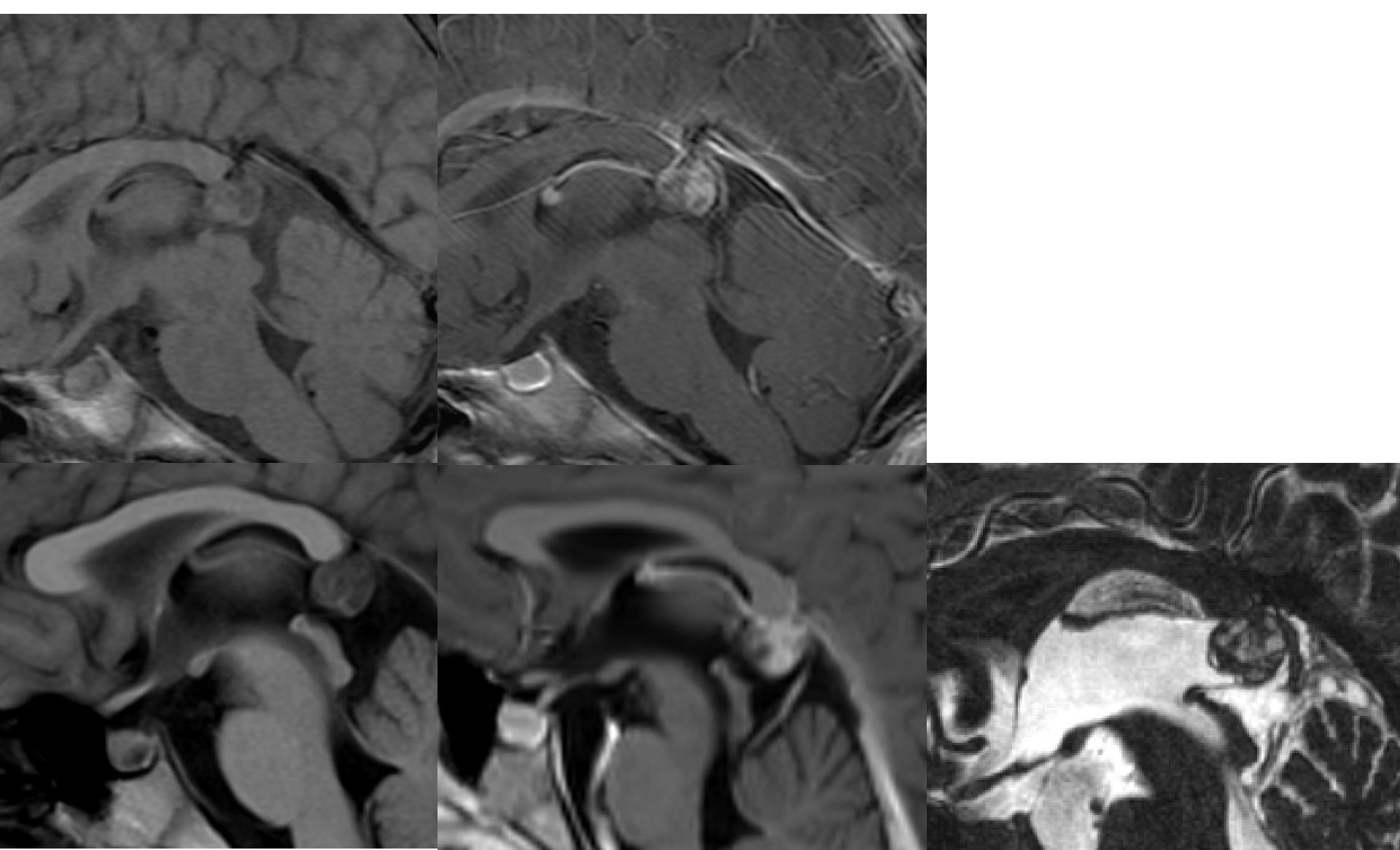
Région pinéale

Kystes de la glande pinéale

- 20-40% en autopsie
- 11%, dès 3 ans; 74% septations (Lacroix-Boudhrioua 2011)
- 57%, fille 67%, dès 1 mois, 4,2 mm (1,5-16mm), 24,6% septations (Whitehead 2013- 3T).
- Kyste simple (> 5 mm, bien limité, contours réguliers, épaisseur <2mm, pas de nodule), complexe (septations, niveaux, pas totalement liquidien).
- Taille stable.
- Diagnostic différentiel : germinome kystique et pinéocytome, rarement purement kystiques.
- Contrôle IRM : kyste atypique (nodule, paroi>2 mm); symptômes progressifs, pot liés à glde pinéale, kyste >10 mm (Smith 2010).
- Pas de suivi pour kyste asymptomatique.
- Ciss : structure interne.





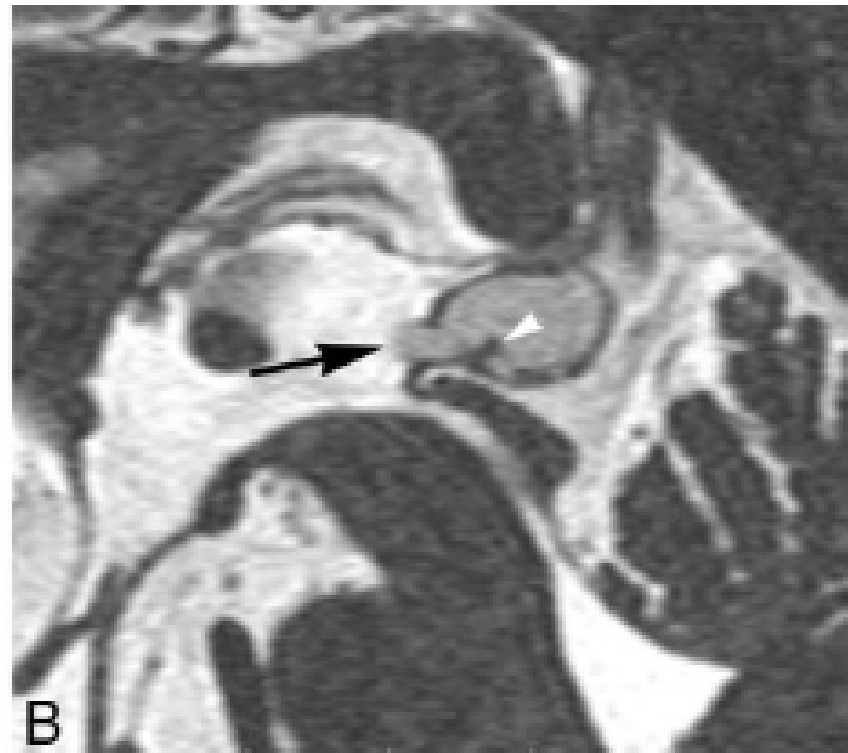


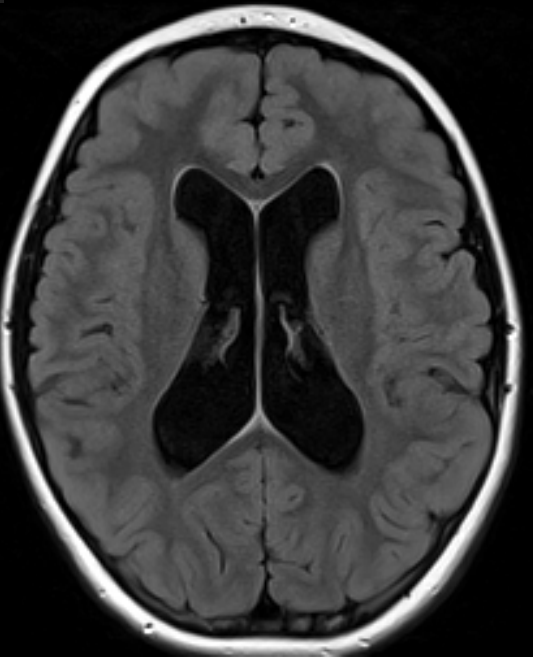
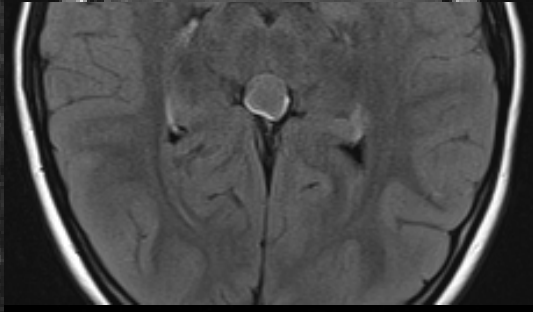
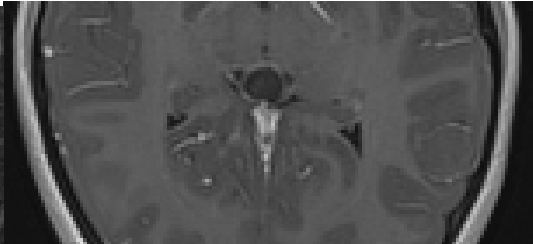
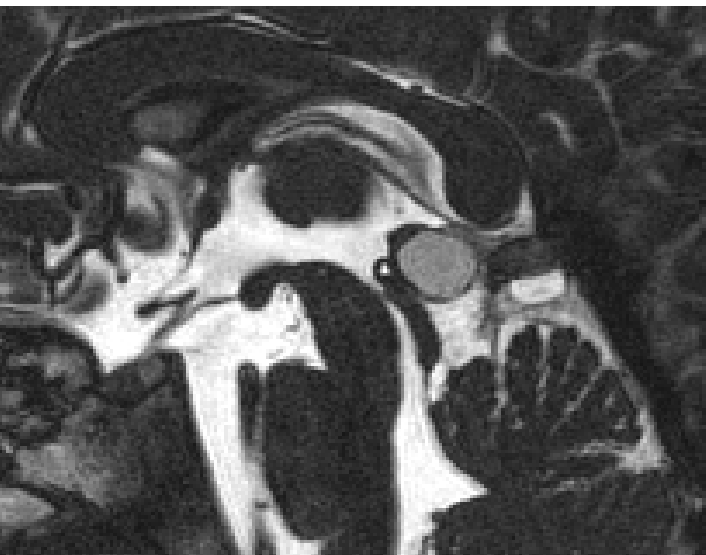
Kyste atypique, à surveiller

Case Report

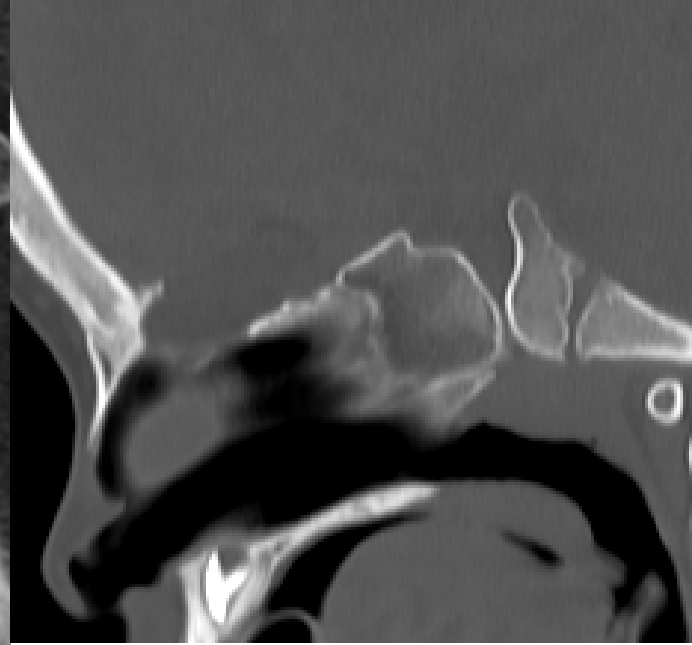
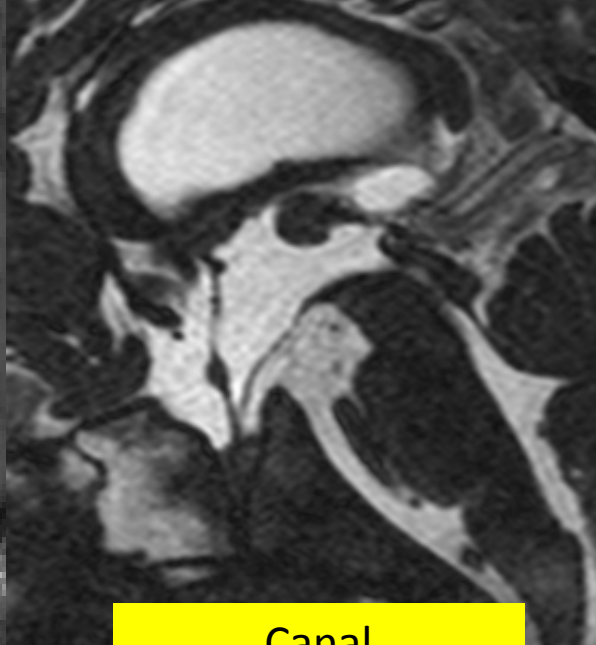
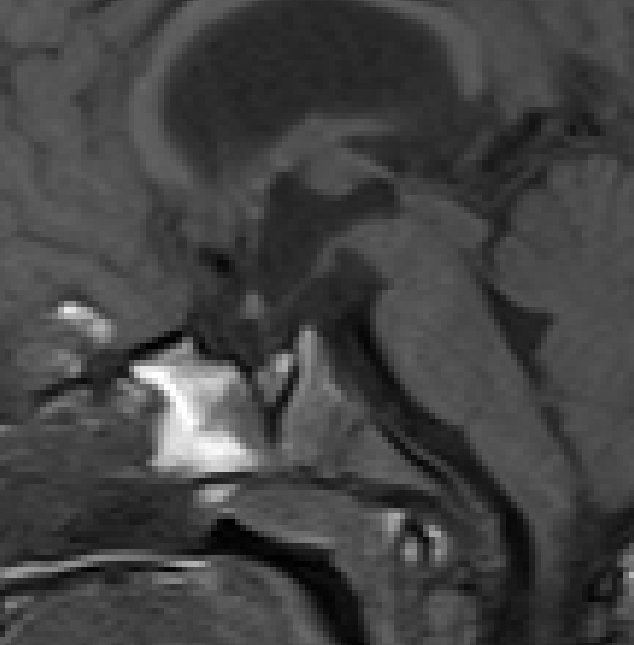
**Pineal Cystic Germinoma with
Syncytiotrophoblastic Giant Cells Mimicking MR
Imaging Findings of a Pineal Cyst**

Yoshiko Hayashida, Toshinori Hirai, Yukunori Korogi, Masato Kochi, Noriko Maruyama, Masayuki Yamura,

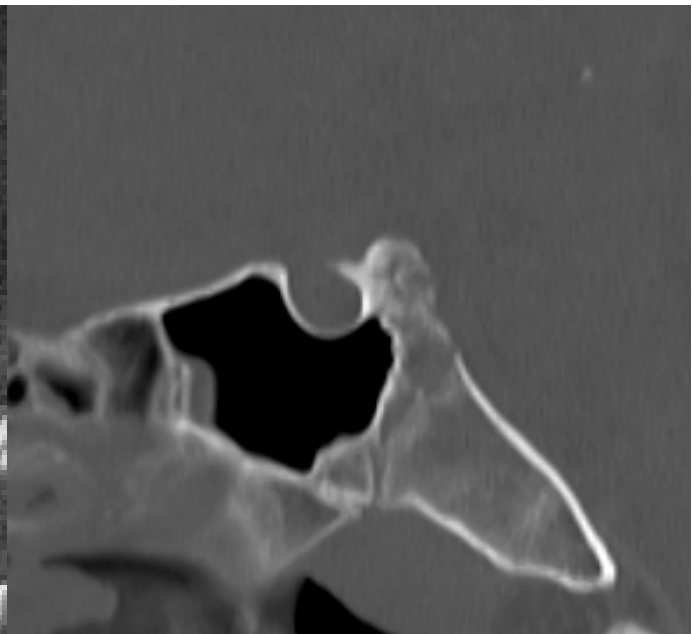
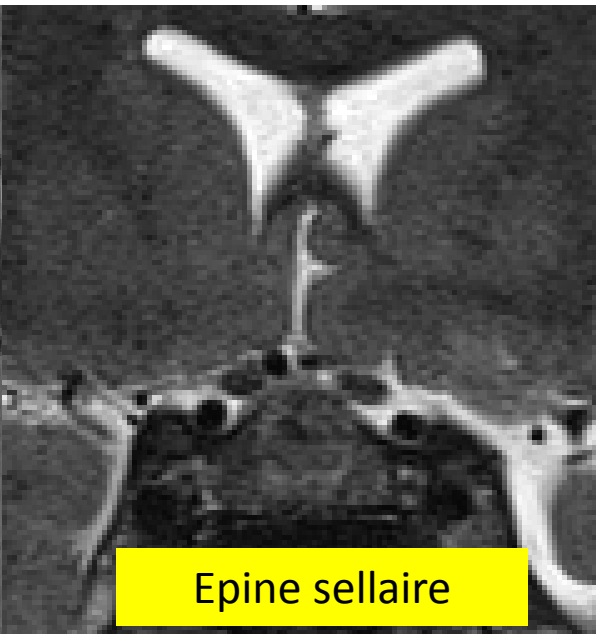
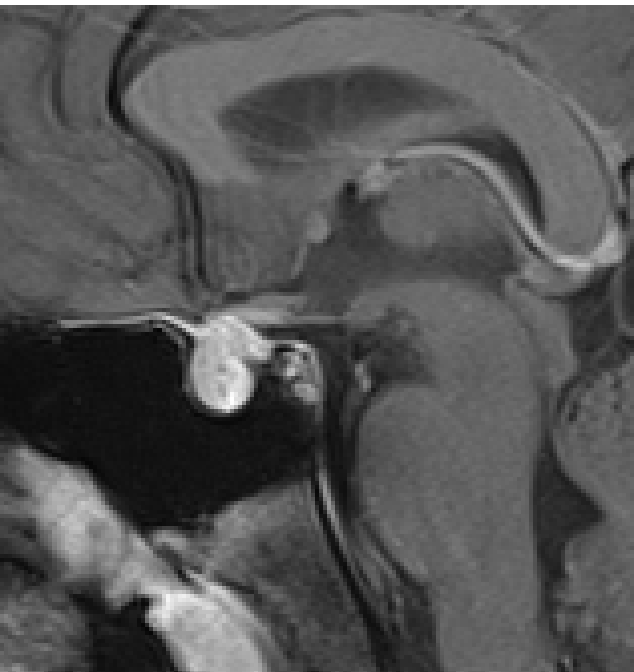








Canal
craniopharyngien



Epine sellaire

Conclusion

- Incidentalomes :
 - fréquents
 - bénins
 - peu d'impact clinique
- Signaler et surveiller à bon escient