2025

KARNATAKA RADIOLOGY EDUCATION PROGRAM

CASE PRESENTATION

CASE PRESENTATION - 1

- 77 year female

- Presenting complaints:

memory disturbance, gait disturbance & urinary incontinence x 3 months

- Past history:

DM x 10 years, HTN

- Surgical history:

Hysterectomy 30 years back

- o/e:

Vitals-stable

Systemic Examination-

CNS: magnetic, broad based & short stepping gait; 4+/5 power in all limbs, rest-WNL

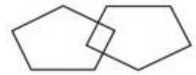
MMSE: 15/30

MMSE

- 11 questions to check for cognitive impairment
- Maximum score is 30.
- >/= 25 is normal.
- < 24 is possible cognitive impairment.

Patient's Name:_____ Date:_____

Instructions: Ask the questions in the order listed.
Score one point for each correct response within each question or activity.

Maximum Score	Patient's Score	Questions
5		"What is the year? Season? Date? Day of the week? Month?"
5		"Where are we now: State? County? Town/city? Hospital? Floor?"
3		The examiner names three unrelated objects clearly and slowly, then asks t to name all three of them. The patient's response is used for scoring. The ex repeats them until patient learns all of them, if possible. Number of trials:_
5		"I would like you to count backward from 100 by sevens." (93, 86, 79,72, 65, after five answers. Alternative: "Spell WORLD backwards." (D-L-R-O-W)
3		"Earlier I told you the names of three things. Can you tell me what those we
2		Show the patient two simple objects, such as a wristwatch and a pencil, an patient to name them.
1		"Repeat the phrase: 'No ifs, ands, or buts.'"
3		"Take the paper in your right hand, fold it in half, and put it on the floor." (The examiner gives the patient a piece of blank paper.)
1		"Please read this and do what it says." (Written instruction is "Close your ey
1		"Make up and write a sentence about anything." (This sentence must conta and a verb.)
1		"Please copy this picture." (The examiner gives the patient a blank piece of asks him/her to draw the symbol below. All 10 angles must be present and intersect.) 
30		**TOTAL**

CLINICAL DD

- Normal pressure hydrocephalus
- Normal ageing brain
- Alzeimer dementia
- Obstructive hydrocephalus

INVESTIGATIONS

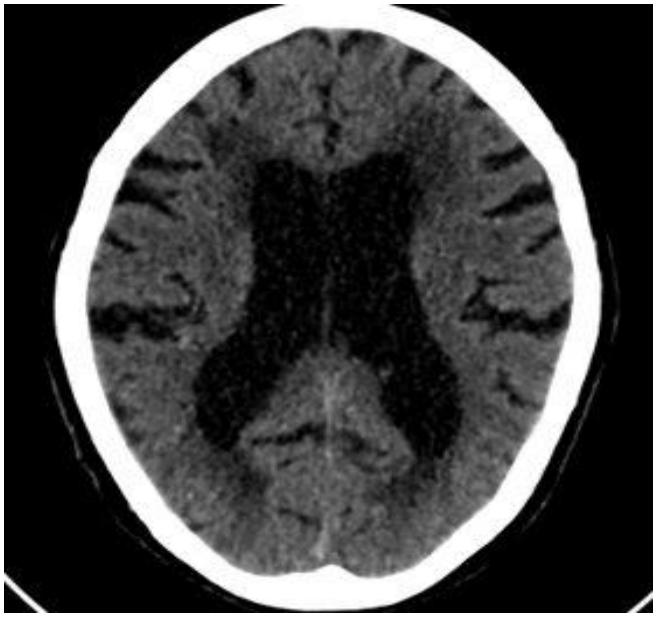
- Lumbar puncture drainage was done, 30 ml CSF drained
- Opening CSF pressure - 12 cm of H2O
- CSF analysis – WNL
- Patient was reassessed after 1 hour which showed an MMSE of 18/30 with improved gait.

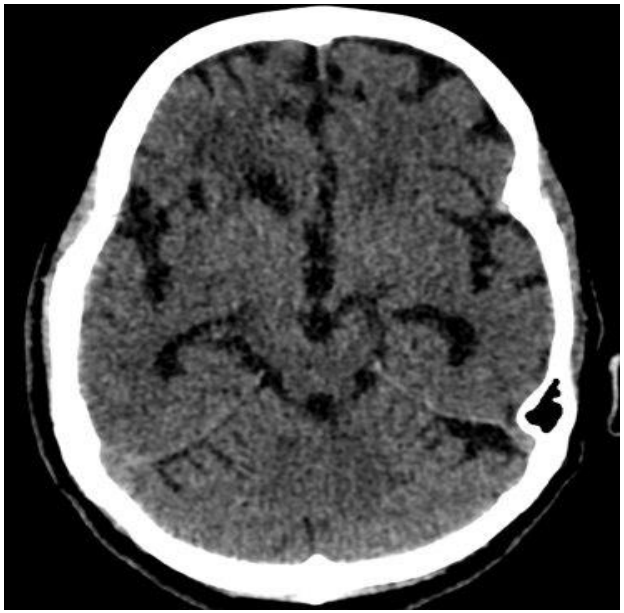
- CT Brain

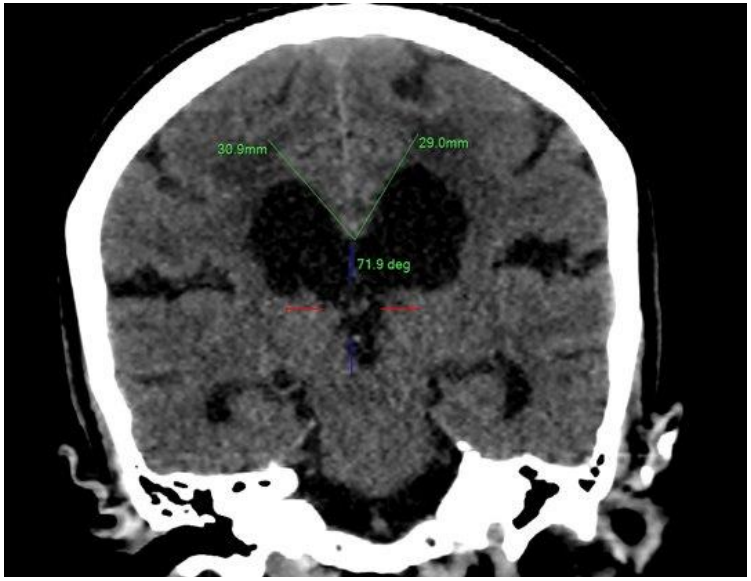
FINDINGS

1. Dilated ventricles which is disproportionate to the extent of cerebral atrophy
2. Acute callosal angle- 72 degrees
3. Upward bowing of corpus callosum with relative crowding of sulci at vertex
4. Widening sylvian fissure and insular cistern

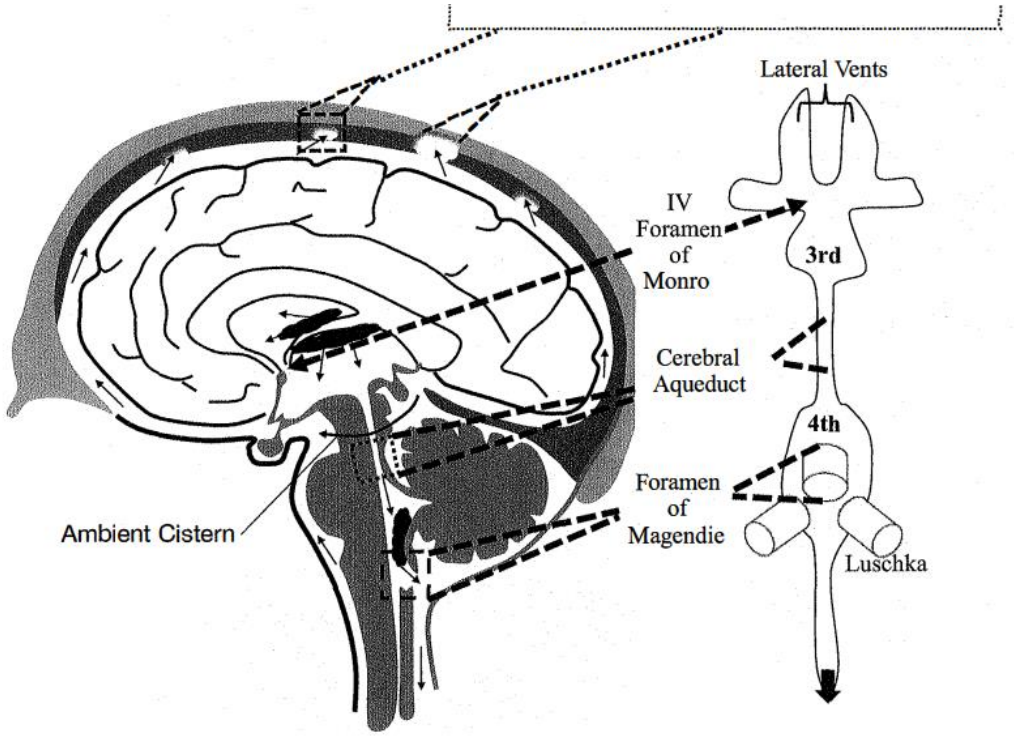
→***Findings are consistent with clininal diagnosis of NPH***






30.9mm
29.0mm
71.9 deg

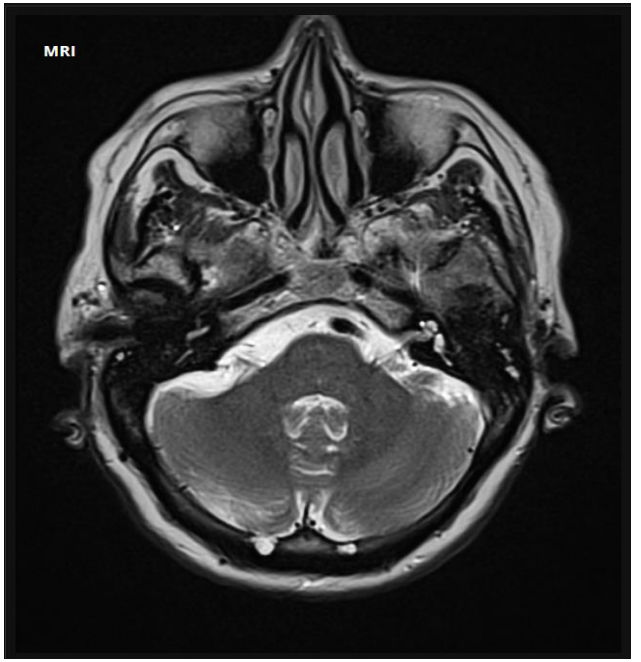
VENTRICULAR ANATOMY



ARACHNOID GRANULATIONS

- Regions where arachnoid projects into venous system allowing CSF to be reabsorbed
- Round or oval in shape
- CT-

MRI-

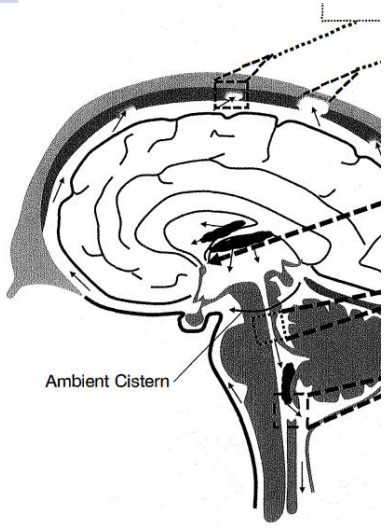


HYDROCEPHALUS

- **Hydrocephalus** denotes an increase in the volume of CSF, causing the distension of ventricles due to insufficient passage of the CSF from its point of production in the ventricles into the systemic circulation
- **2 types**:

1. Communicating Hydrocephalus
2. Non communicating / obstructive hydrocephalus

COMMUNICATING HYDROCEPHALUS	NON COMMUNICATING HYDROCEPHALUS
l ventricles are big. 25% cases-4th ntricle is normal	Upstream ventricles are big
vel of obstruction-b/w basal cisterns d arachnoid granulations	Level of obstruction- within the ventricle system
F can exit all ventricles	CSF cannot exit all ventricles



COMMUNICATING HYDROCEHALUS

- **True obstruction-**

  Anything that plugs into villi:

1. Blood- SAH
2. Pus- Meningitis (TB / Bacterial)
3. Cancer- Carcinomatous meningitis

- **Without obstruction-**

1. Brain atrophy (ex-vacuo)
2. NPH
3. Choroid plexus papilloma

Choroid plexus papilloma:

Well defined lobulated masses

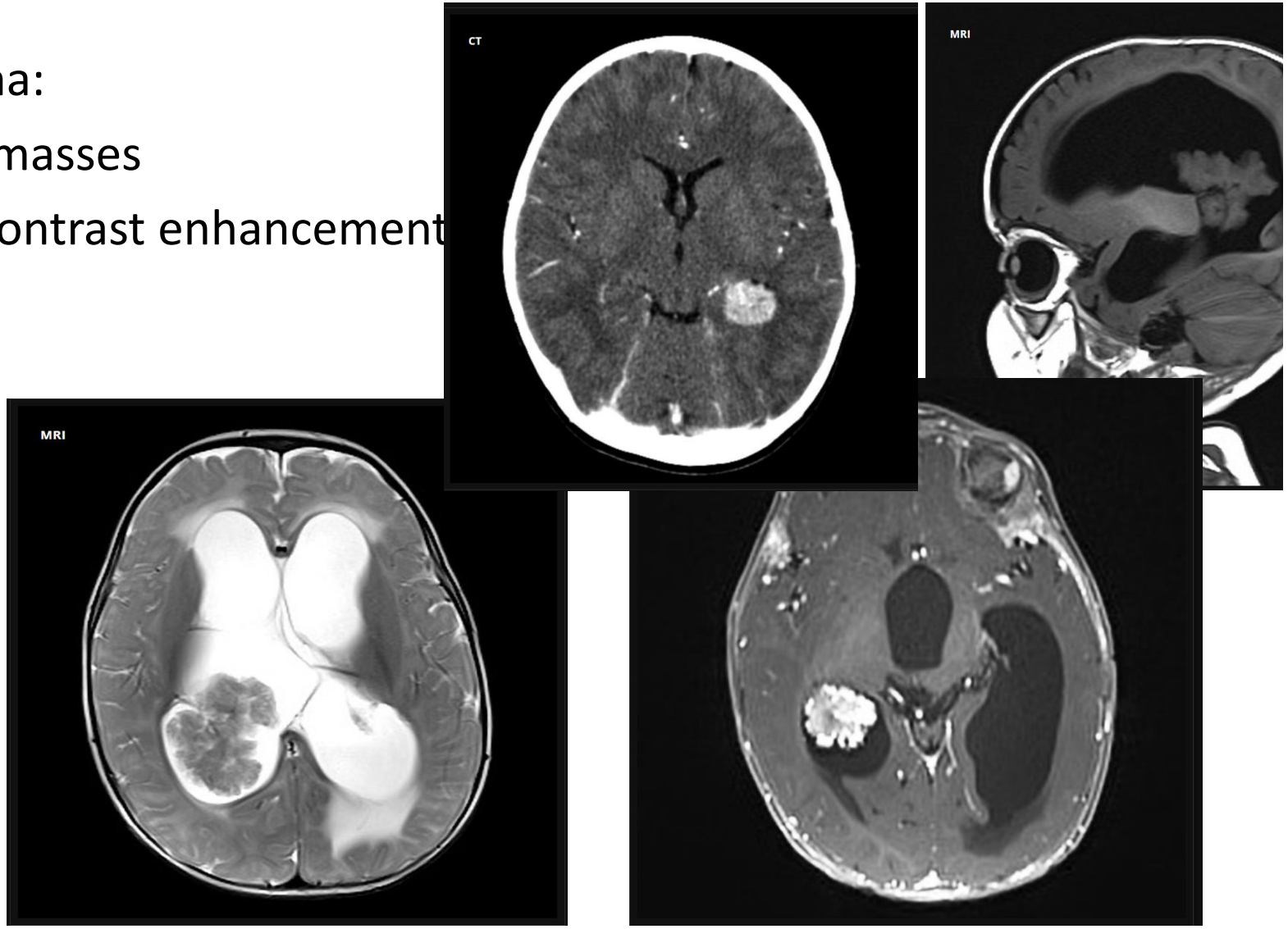
CT: iso to hyperdense, contrast enhancement

MRI:

T1- iso to hypointense

T2- iso to hyperintense

T1+C- contrast enhance



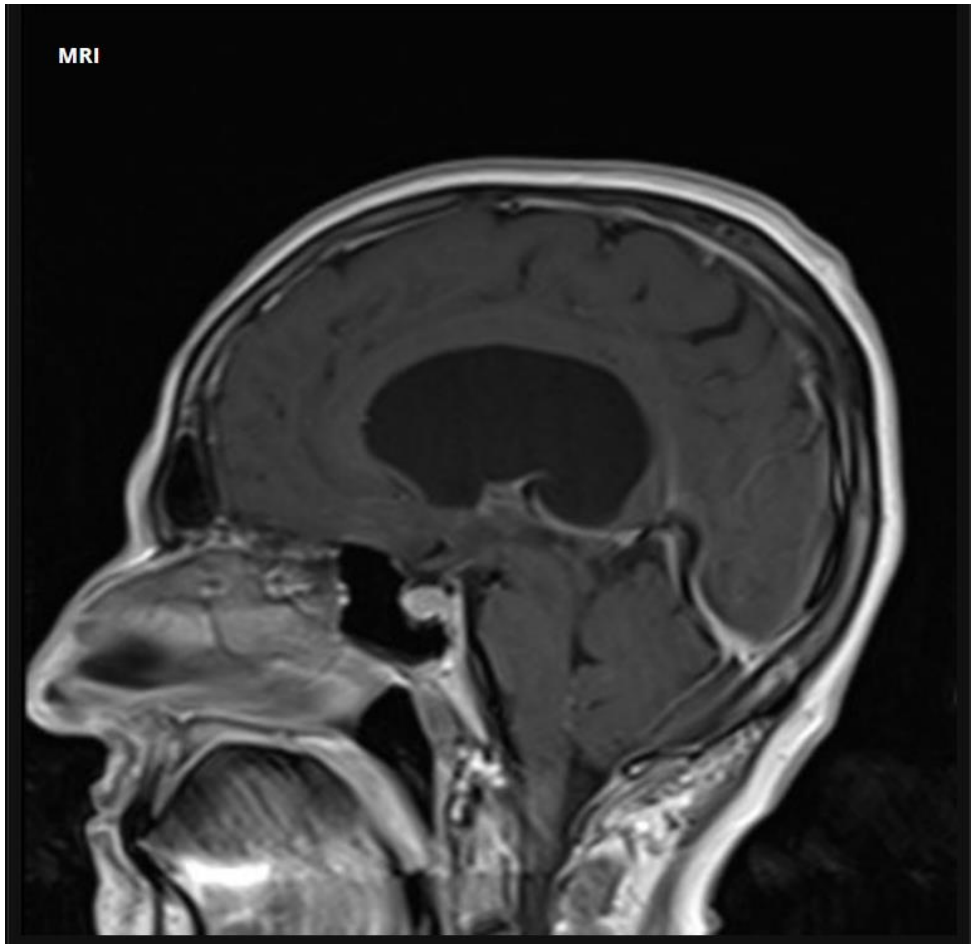
NON COMMUNICATING HYDROCEHALUS

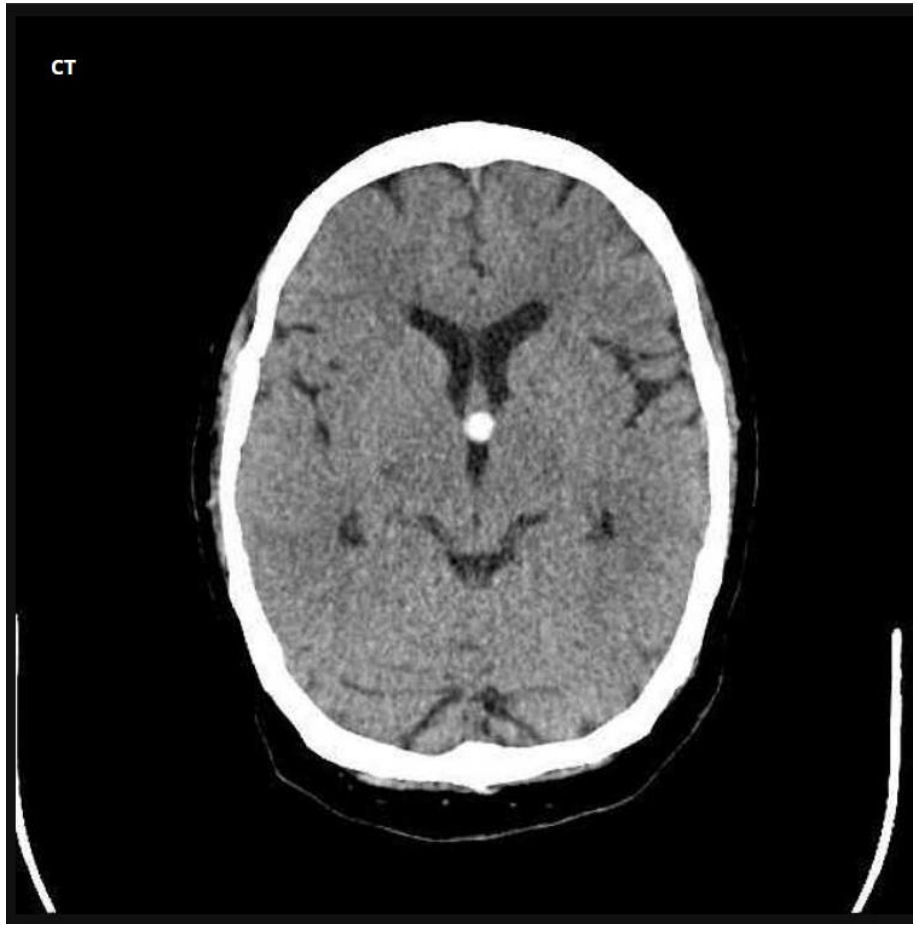
- Level of Obstruction-

1. **Foramen of Monro**
   - Colloid cyst
   - Stenosis

2. **Aqueduct**
   - Aqueductal stenosis
   - Tectal glioma

3. **4th ventricle**
   - Posterior fossa tumour
   - Cerebellar edema

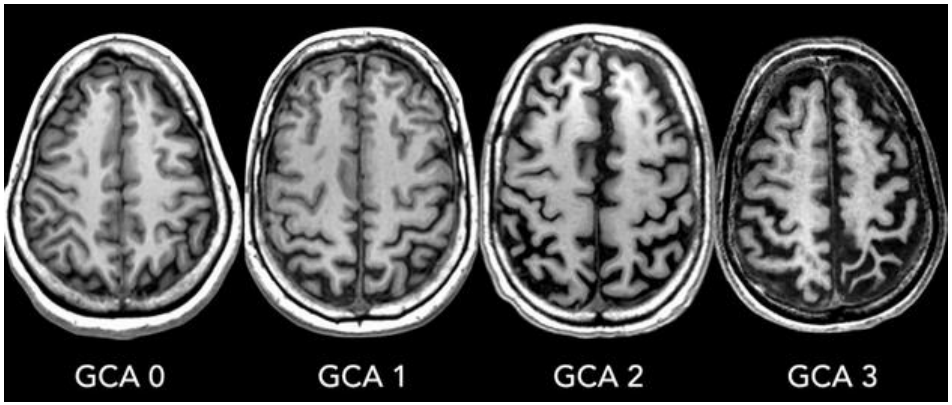



CT


MRI

Other Clinical DD

1. Normal ageing brain:

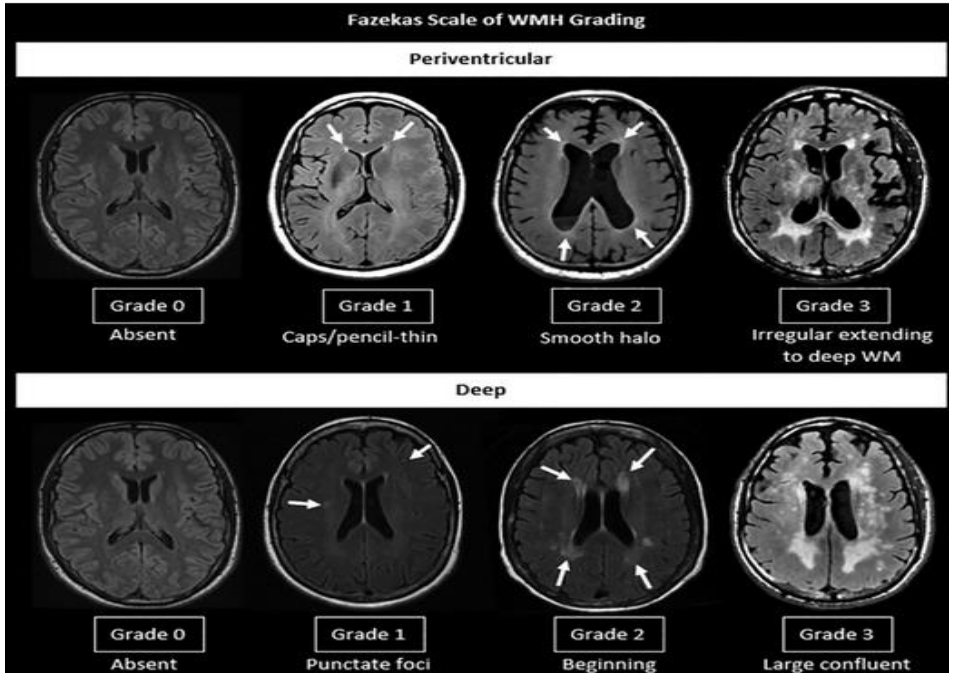


- Cerebral volume loss-

Mild – opening of sulci
Moderate – volume loss of gyri
Severe – knife blade appearance of gyri

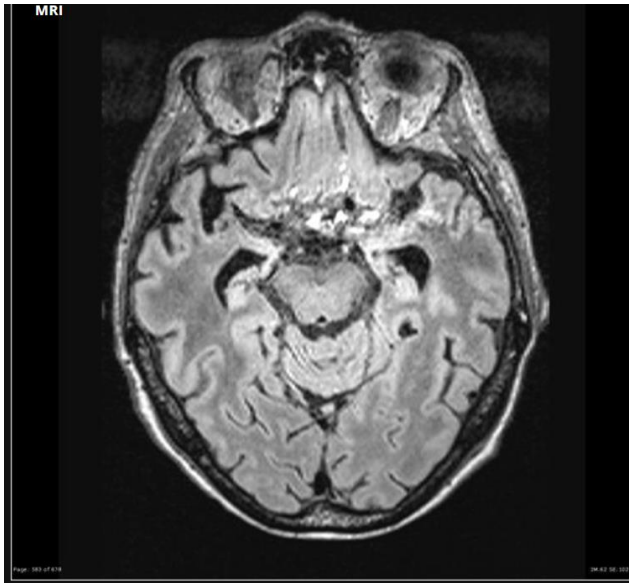
- Small vessel ischemic changes-

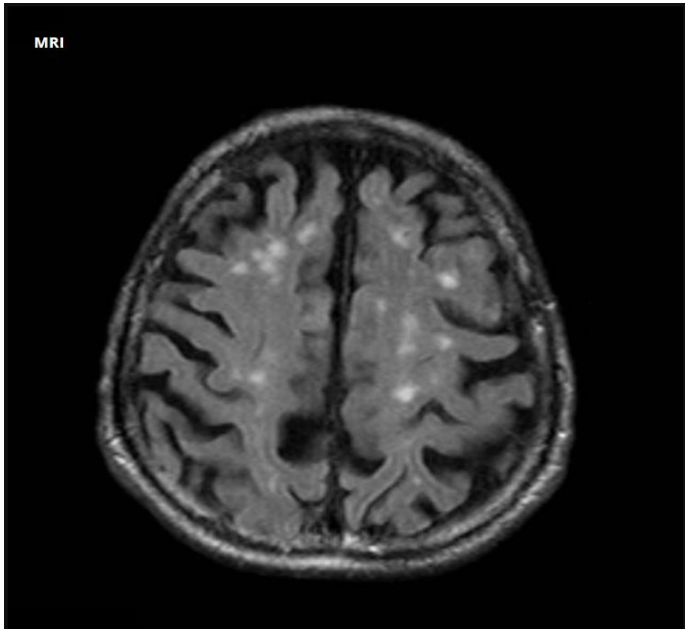
Periventricular and deep white mater hypodensity / T2 LFAIR hyperintensity

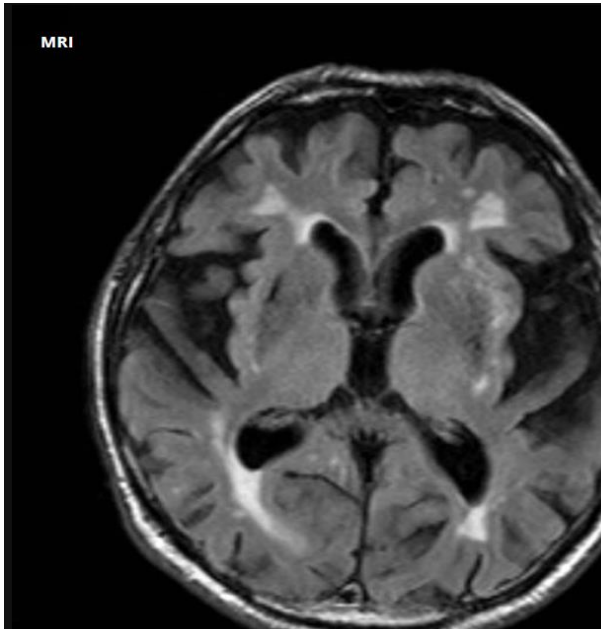


2. Alzeimers dementia

- Mesial temporal lobe atrophy
- Temporo parietal lobe atrophy







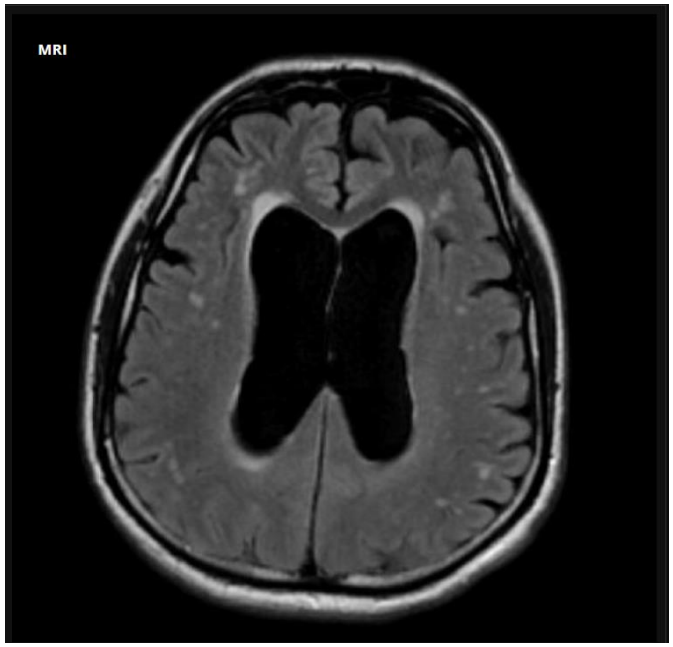
NORMAL PRESSURE HYDROCEPHALUS

- Idiopathic
- Elderly (60s)
- Clinical triad of urinary incontinence, confusion & ataxia
- Ataxia is most pronounced
- As the name suggests, opening CSF pressure is within the normal range (10-25 cmH_2O)
- Communicating hydrocephalus + Elderly + Ataxia = NPH
- Communicating hydrocephalus + Young/Middle aged + Headache=Syndrome of Hydrocephalus in Young and Middle aged

CT & MRI

1. Dilated ventricles which is disproportionate to the extent of cerebral atrophy
2. Acute callosal angle
3. Upward bowing of corpus callosum with relative crowding of sulci at vertex
4. Widening sylvian fissure and insular cistern
5. Transependymal seepage of CSF and prominent flow void in 3rd ventricle and aqeduct

1. **Dilated ventricles which is disproportionate to the extent of cerebral atrophy**:

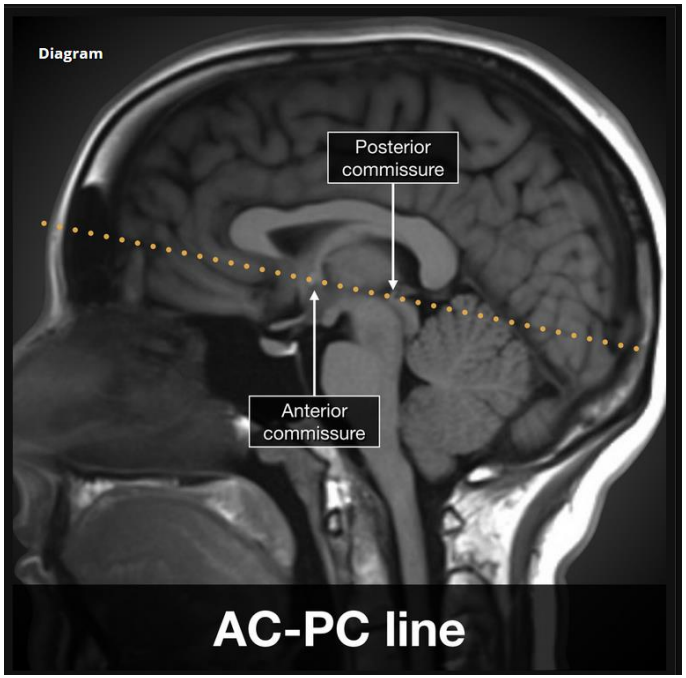


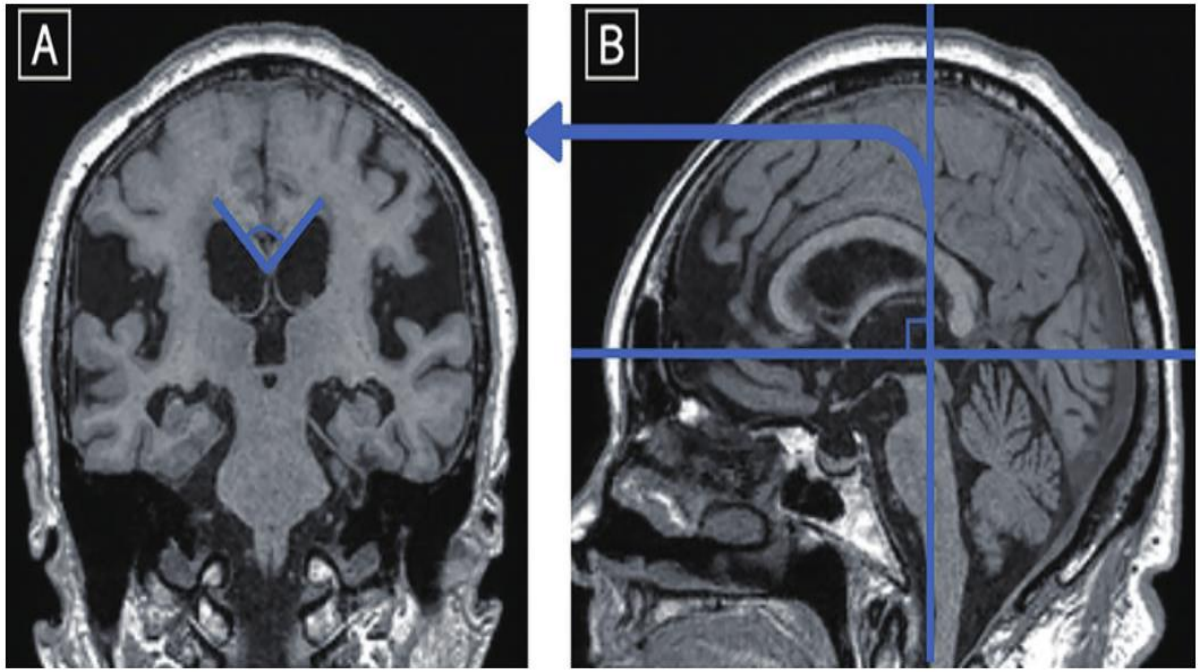
2. **Acute callosal angle**:

Measured on a coronal image perpendicular to anterior commissure-posterior commissure plane at the level of posterior commissure

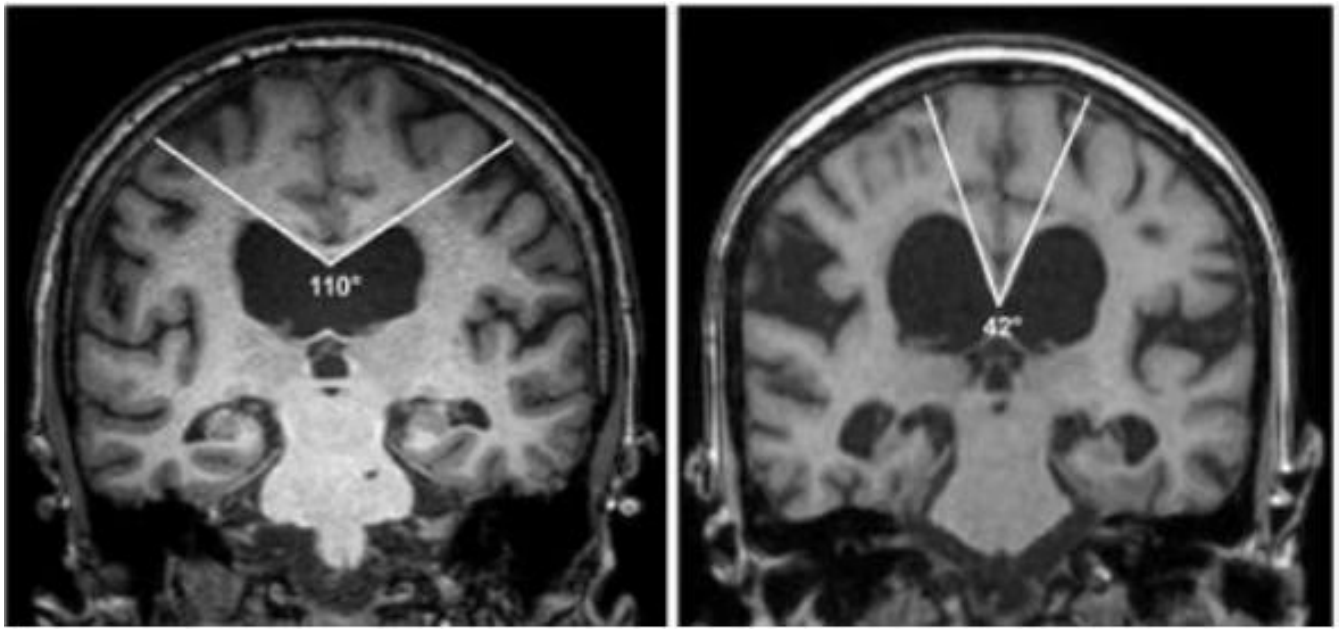
normal : 100-120°.

NPH : 50-80°

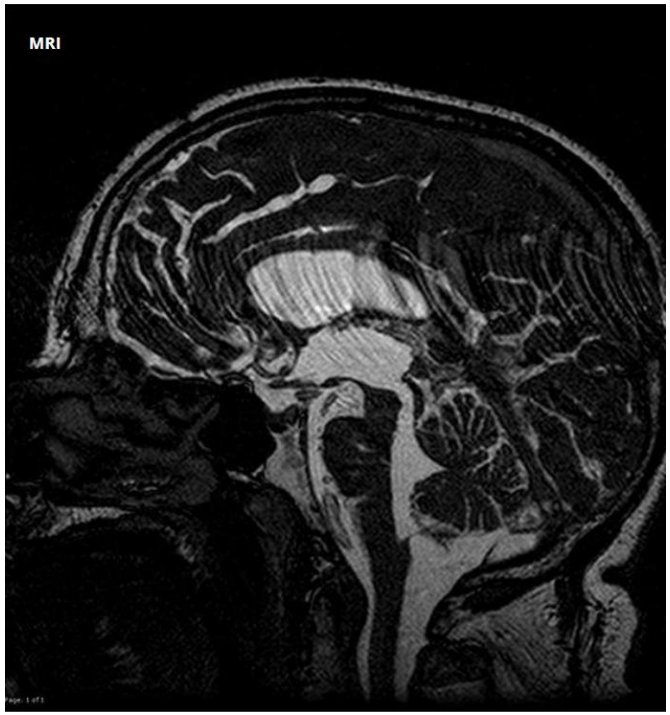




- Acute callosal angle

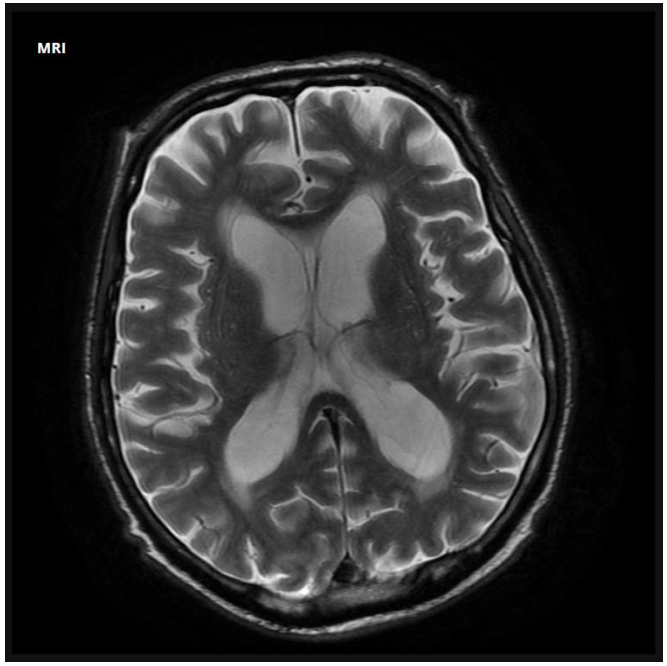


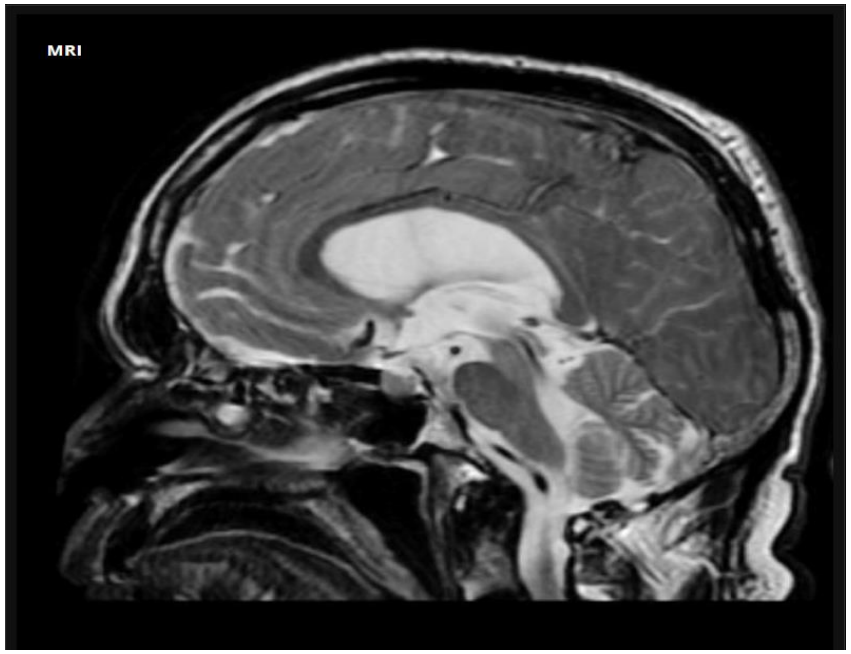
3.**Upward bowing of corpus callosum with relative crowding of sulci at vertex**.



4. **Widening sylvian fissure and insular cistern**

4. **Transependymal seepage of CSF and prominent flow void in 3rd ventricle and aqeduct - indicates rapid flow.**





Rx

- CSF shunting, usually VP shunt.
- 80% respond favourably to CSF diversion
- Right Fraziers point programmable ventriculoperitoneal shunt (Codman) insertion with antisiphon device