

PBL 4

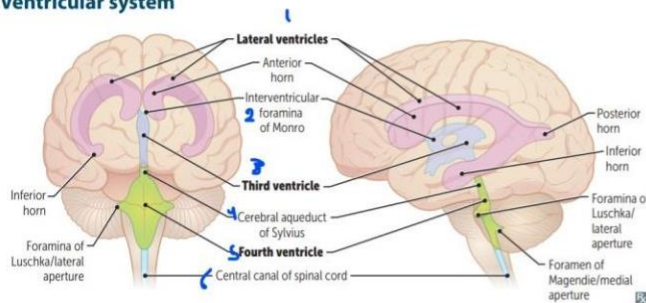
This lecture mainly contains clinical cases.

➤ Case 1: a neonate with a big head, expanding more and more every day.

- The diagnosis to be on the top of your list should be hydrocephalus = accumulation of CSF intracranially
- Hydrocephalus, in general, is caused by either:
 1. **obstruction** in CSF flow or
 2. excessive **production** of CSF such as in the case of Choroid plexus papilloma
- Regarding the early age of the patient, we will exclude space-occupying lesion causes to a great extent, focusing on the **congenital** causes.
- Signs “noticed by the doctor” will be:
 1. large head (cranial cavity expands due to the fact that the sutures and the fontanelles haven't closed yet)
 2. shiny skin with underlying extended dilated veins
 3. sunset eyes (caused by tectum obstruction)
- Mx: MRI to check the ventricular system “dilated ventricles vs normal”
- Recall the flow and the general anatomy of the ventricular system:



Ventricular system



Lateral ventricles → 3rd ventricle via right and left interventricular foramina of Monro.

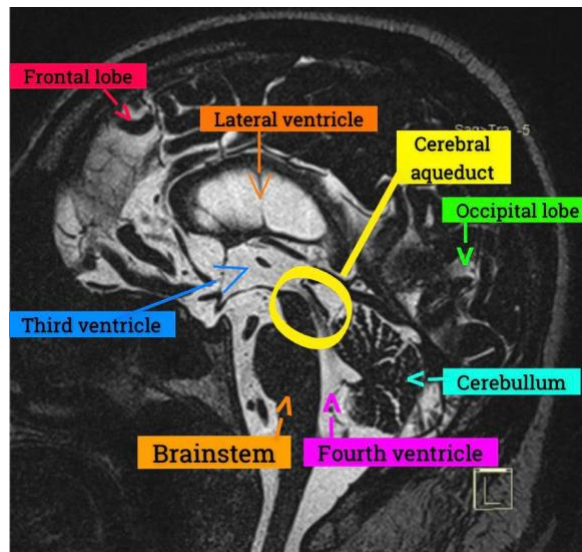
3rd ventricle → 4th ventricle via cerebral aqueduct of Sylvius.

4th ventricle → subarachnoid space via:

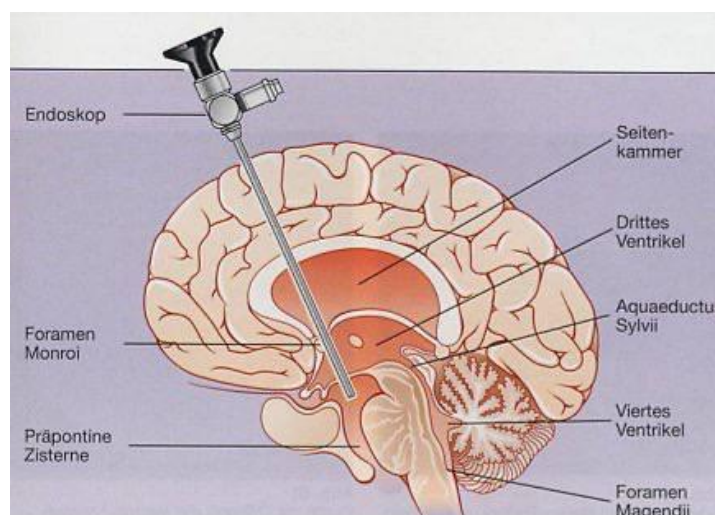
- Foramina of Luschka = lateral.
- Foramen of Magendie = medial.

CSF made by choroid plexuses located in the lateral, third, and fourth ventricles. Travels to subarachnoid space via foramina of Luschka and Magendie, is reabsorbed by arachnoid granulations, and then drains into dural venous sinuses.

- **MRI image shows:**
 1. stenosis of the aqueduct of Sylvius and
 2. dilation of the lateral ventricles scalloping the corpus callosum:

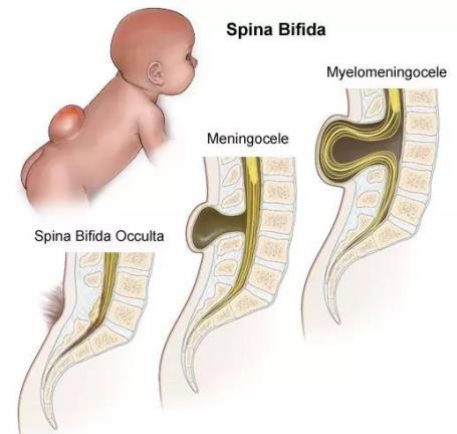


- The **treatment** will be either by
 1. CSF shunt or
 2. 3rd ventricle floor cisternostomy
- CSF shunt can be a **ventriculoperitoneal** shunt (most used and preferable shunt), **ventriculopleural** shunt or **ventriculoatrial** shunt.
- **Cisternostomy** is done using the endoscope by entry to lateral ventricle and then third ventricle to introduce an opening in the floor of the third ventricle facilitating CSF drainage.
- Stents are **unapplicable** due to the risk of patency of the stenosis by continuous and recurrent gliosis



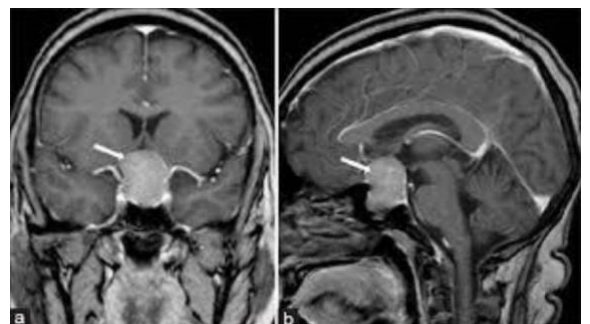
➤ Case 2: Spina bifida:

- Sometimes, a baby is born having a cyst on his lower back due to failure of closure of the neural tube, which could happen in cases of **follic acid deficiency** – which occur mostly due to pregnant mothers ignoring medical advice-.
- For patients with higher risk, like patients taking antiepileptic drugs-, folic acid should be recommended for three months prior to conception, also, it should be recommended for pregnant ladies in general prophylactically.
- This cyst is actually a continuation between the skin and the spinal canal.
- If the cyst is obvious, it is called **Spina Bifida Aperta**, which can be divided according to the cyst's contents to:
 - Meningocele: only CSF, the patient's neurological functions are still intact.
 - Myelomeningocele: CSF and neuronal tissue, usually the patient presents with neurological deficits, mostly weakness.
- If the cyst is not obvious, it is called **Spina Bifida Occulta**: (when a baby's backbone (spine) does not fully form during pregnancy. The baby is born with a small gap in the bones of the spine, google).
- Treatment: repair this cyst by **closure**.



➤ Case 3: Brain tumors:

- One of which is **pituitary adenoma**.
- can be **functioning or non-functioning** - hormone secreting or not-.
- Symptoms of the functioning tumors can vary depending on the type of the secreted hormone:



1. **ACTH**: Cushing syndrome which includes moon face, buffalo hump, abdominal striae (stretch marks), hypertension and hyperglycemia.
2. **Growth hormone**: in the case of a child, he will present with gigantism. If he was an adult, it would cause acromegaly (heart failure due to cardiomegaly, colon cancer and enlarged tongue, nose, forehead, hands and toes).

3. **Prolactin** “prolactinoma”: in **males** it causes gynecomastia, infertility and loss of libido. In **females** it causes galactorrhea and amenorrhea.
4. **TSH**: which causes hyperthyroidism (heat intolerance, tremors, etc...).
5. **FSH and LH**: rare, causing infertility.

- The first line of treatment for pituitary adenomas is surgery – **except for prolactinoma-**, by transsphenoidal hypophysectomy: by entering through the nose → sphenoid sinus → Sella turcica then removing the tumor.
- First line of treatment for prolactinoma is dopamine agonists - Bromocriptine-.
- But why do we remove the non – functioning tumors? because tumors tend to grow **increasing the intracranial pressure**, compressing certain areas in the brain, mainly the optic chiasm, causing bitemporal hemianopsia, so it should be resected.

- Other more common tumors could arise from the brain parenchyma itself (glioma) or its coverings (meningioma), however, symptoms **depend on their location**.
- If a tumor is in the left frontal lobe, it would cause frontal lobe syndrome (cognition, movement on the contralateral side if it was compressing the motor cortex, speech problem or motor “expressive” aphasia if Broca’s area is affected and the patient is right-handed).
- Tumors also cause Seizures, increased intracranial pressure, which would cause headaches, nausea, **projectile** vomiting, and cranial nerves palsy.
- Treatment: if it is resectable, we resect the tumor, study its histology, and determine the best course of therapy.

