

Neurosurgery Core Content

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❖ Normal Pressure Hydrocephalus

- **Memory loss, ataxia, urinary incontinence: check CT**

❖ Pseudotumor Cerebri

- **^ ICP, pregnancy, papilledema**

❖ Hematomas:

- **Subdural**
- **Epidural**
- **(SAH)**
- **Intracerebral Bleed**
 - **Hypertensive**
 - **AVM**
 - **Hemorrhagic CVA**
 - **Bleed into tumor**

❖ Subarachnoid Hemorrhage

- **30-50% mortality (still); only half of survivors have a good outcome**
- **frequently missed; 10% of all CVAs are from SAH**
- **mostly in young people, mostly from berry aneurysm (less likely AVM)**
- **more common with**
 - **sub-Saharan African ancestry**
 - **women (more common during menses)**
 - **certain risk factors: menopause, smoking, hypertension, EtOH, pregnancy**

- polycystic kidneys, Marfan syndrome, Ehlers-Danlos syndrome, fibromuscular dysplasia
- family history
- **Presentation**
 - Thunderclap, worst HA of life, exploding, nausea and vomiting, stiff neck (10-15' after), during sex
 - "sentinel headache": small bleed?
 - Syncope or seizure
 - Subhyaloid (small round) retinal hemorrhages are pathognomonic
 - Arrhythmias and ST or T changes classic
- **Diagnosis:**
 - CT (80-90% sensitive if done right away); MRI not as good
 - Check CT for intracerebral bleed or AVM that could be source, or for hydrocephalus
 - If CT negative, and high suspicion, do LP for blood or xanthochromia; have to wait 4 hours. Xanthochromia pathognomonic; 100% sensitive @ 12 hours; may last up to 3 weeks (3/4 of cases). Despite textbooks, _visual_ analysis is standard of care for xanthochromia.
- **Complications:**
 - Rebleed (sedate mildly, control BP)

- Vasospasm (nimodipine PO or NG, nicardipine=Cardene IV)
- Hydrocephalus (check for this on CT, indication for immediate neurosurgical intervention)
- No Amicar, no steroids.
- Ratings
 - Hunt & Hess (I-V), Cooperative Aneurysm Scale (I-IV), World Federation of Neurological Surgeons (I-V)
- Clip anything bigger than 5 mm (like fix any AAA more than 5 cm)
- ❖ **Brain Tumors**
 - Why important in ED?
 - Kids: 75% tentorium, adults opposite
 - Types
 - Mets
 - ◆ 1/3 of all brain tumors
 - ◆ Lung, Breast, melanoma, hypernephroma, colon
 - ◆ 10% of CA diagnosed by brain mets
 - Malignant Gliomas (1/2 of primary brain tumors)
 - ◆ Glioblastoma multiforme (very malignant)
 - ◆ Astrocytoma (not so malignant)
 - Meningiomas
 - ◆ “benign”

- ◆ 1/4 of **primary** brain tumors
- ◆ hormone sensitive
- **Pituitary Adenomas**
 - ◆ 1/10 of **primary** brain tumors
 - ◆ bitemporal hemianopsia (in 1/3)
 - ◆ Amenorrhea-galactorrhea
 - ◆ Impotence
 - ◆ Cushing Syndrome
- **Acoustic Neuroma**
 - ◆ 1/10 of **primary** brain tumors
 - ◆ Benign Schwannoma of 8th CN
 - ◆ Unilateral hearing loss in >95%
 - ◆ Tinnitus, vertigo, dysequilibrium, facial paresthesia, dysphagia, hoarseness
- **Familial tumors** (“neurophakomatoses”)
 - ◆ Von Recklinghausen neurofibromatosis, von Hippel-Landau hemangioblastoma, tuberous sclerosis.
- **Brain Tumor presentation**
 - **Headache:**
 - steady, nonthrobbing, dull, aching; relieved by analgesics.
 - **Morning prominence**
 - **Worse with Valsava**
 - **Vomiting without nausea**
 - **Seizures:**

- ◆ negligible cause of seizures of those 20 years old
- ◆ Seizure with focal signs -> tumor in 50%
- Headache + papilledema + vomiting = classic tumor ^ICP presentation
- Migraine-Tumor differences:
 - Vomiting **without** nausea suggests tumor
 - Dull non throbbing headache suggests tumor
- Brain Tumor workup:
 - “neurology is what you do until the patient gets back from CT”
 - LP? “risk of herniation”? “meningeal carcinomatosis”? (if CT negative)
- Treatment of herniation or “crumping”
 - ◆ hyperventilation (? Ischemia of “watershed” areas),
 - ◆ mannitol 25-50-75 g,
 - ◆ Dilantin 1 g IV load,
 - ◆ Decadron 10 mg then 4 Q6for 48 hours.
 - ◆ Neuro induction if intubating
 - ◆ Decompression or change to supportive care only.
- ❖ **Brain Abscess**

- From sinusitis, otitis, tooth abscess in 10-30 year olds (1/3)
- Hematogenous from other infection, IVDA (1/3)
- From surgical sites or unknown in other 1/3
- Will see fine on regular non-con head CT
- ❖ **VP shunts (and similar)**
 - Infection: tenderness along site
 - Malfunction: CT for hydrocephalus
- ❖ **Spinal Column Problems**
 - Back Pain
 - Kids: x-rays for spondylolysis or spondylolisthesis
 - Spondylolisthesis
 - ◆ More common at L5 (70%) and then L4 (25%) and then L3 (4%)
 - ◆ classification:
 - I - (isthmic) 0-15% listhesis; associated with a pars defect
 - II - (congenital) 25-50% listhesis; inadequate posterior elements
 - III - (degenerative) 50-75% listhesis; degeneration of posterior longitudinal ligament
 - IV - (pedicle 75% listhesis; due to elongated neural arch abnormality)

V - (destructive) from metastatic or infectious diseases

- **Epidural hematoma? Sudden very severe spinal pain, no prodrome; confused with aortic dissection**
 - ◆ **May be after straining, may be vascular risk factors, may be idiopathic**
 - ◆ **May develop focal spinal syndrome after a few hours**
 - ◆ **MRI**
 - **Epidural abscess? (drug abuser, immunosuppressed with DM, steroids, cancer, renal failure, fever, ^ ESR): MRI**
 - **With Sciatica:**
 - ◆ **? piriformis syndrome**
 - ◆ **? L4-5 or L5-S1 disk**
 - ◆ **Check for Cauda Equina Syndrome: saddle anaesthesia? Problems with bowel or bladder? Consider rectal/perirectal sensation testing.**
 - ◆ **Sensory only: analgesia and rest and outpatient follow-up**
 - ◆ **Reflex loss: follow-up soon.**
 - ◆ **Motor: consult spine surgeon by phone**
- **Spinal Stenosis**

- ? Cord Compression (central disk, DJD, tumor, listhesis)
 - MRI entire spine
- Tumors
 - Emergency: “spot-welding”
- ❖ **Extra Credit**
 - Pseudoclaudication
 - ◆ from spinal stenosis
 - ◆ vertebral arch narrowingcauses effort-dependent ischemia of the neuronal vascular supply or vasa vasorum simulating the symptoms of claudication or aortoiliac occlusions.
 - Lhermitte's sign (Barber Chair phenomenon); Jacques Jean Lhermitte
 - Flexing of the neck produces electric shock-like sensations that extend down the spine and shoot into the limbs during. Caused by trauma to the cervical portion of the spinal cord, multiple sclerosis, cervical cord tumour, cervical spondylosis, or even vitamin B12 deficiency.