

# ALL ABOUT PAPILLEDEMA

1 hour

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## Description

This course reviews the clinical presentation of papilledema, and why it should be considered a medical emergency, even in subtle cases. This case-based presentation will demonstrate various etiologies of papilledema and discuss treatment of the underlying cause in both adults and children.

## Learning Objectives

- Recognize the clinical features of papilledema.
- Understand the causes of papilledema in adults.
- Identify the causes of papilledema in children.
- Apply steps for the appropriate work-up for papilledema.
- Recognize the emergent nature of a papilledema diagnosis.
- Understand the appropriate diagnosis and treatment for idiopathic intracranial hypertension.

## OUTLINE

### I. BACKGROUND

- A. Symptoms of Increased Intracranial Pressure
- B. Features of Papilledema
  - a. Axoplasmic stasis
  - b. Obscuration of retinal vessels coursing over the optic disc margin
  - c. Paton's lines (temporally)
    - i. Seen well with OCY en face view of vitreoretinal interface
  - d. Extruded axoplasm
  - e. Possible hemorrhages
- C. Pattern of Edema
  - a. Corresponds with RNFL thickness
    - i. Superior and Inferior fibers swell first
    - ii. Temporal fibers are the last to swell
- D. Modified Frisen Scale
  - a. Grade 0 -Grade 5

- E. Causes of Papilledema
  - a. Brain Tumor or Spinal Cord Tumor
  - b. Venous Sinus Thrombosis
    - i. Septic thrombosis
    - ii. Aseptic thrombosis
  - c. Arteriovenous Malformation / Dural A-V Fistula
  - d. Subdural or Subarachnoid Hemorrhage
  - e. Meningitis
  - f. Other Infectious / Inflammatory Etiology
  - g. Idiopathic Intracranial Hypertension (aka Pseudotumor Cerebri) - *dx of exclusion*
  - h. Dural AV fistula
  - i. Craniosynostosis (in children)
  
- F. Papilledema Work-Up
  - a. Neuro-Imaging
  - b. MRI of brain with contrast and MRV
  - c. (less often MRA)
  - d. Lumbar Puncture (only after imaging)
  - e. Opening pressure
  - f. Analysis of CSF (r/o infection, meningitis, etc)

## II. CASE PRESENTATIONS USED TO DEMONSTRATE THE FOLLOWING

### MEDICAL EMERGENCIES

- A. Hemorrhages in Papilledema
  - g. Severe papilledema
  - h. Acute rise in pressure
  - i. Trauma
  - j. Terson Syndrome (intracranial heme + intraocular heme)
  
- B. Causes of Venous Sinus Thrombosis
  - k. Septic
    - i. Chronic otitis media
    - ii. Scalp infections
    - iii. Pharyngeal infections
    - iv. Infection involving sinuses, mastoids, leptomeninges
    - v. Malignancies
  - l. Aseptic

- i. Acute dehydration
- ii. Congenital heart disease
- iii. Hypercoagulable states / coagulopathies
- iv. Malnutrition
- v. Trauma
- vi. Pregnancy / oral contraceptives
  - 1. Factors that increase clot risk
    - a. Birth control
    - b. Tobacco use
    - c. Age > 35
    - d. History of migraine
    - e. Hypercoagulable states

### **IDIOPATHIC INTRACRANIAL HYPERTENSION**

#### A. Idiopathic Intracranial Hypertension

##### m. Modified Dandy's Diagnostic Criteria

##### i. **ALL of these criteria must be met in order to diagnose IIH**

1. Patient Must Be Awake & Alert
2. Signs & Symptoms Of Increased Intracranial Pressure
3. No Neurologic Signs Except CN VI Paresis
4. Normal Neuro-Imaging (MRI, MRV)
5. MUST be done PRIOR to lumbar puncture ((LP)
6. CSF Opening Pressure > 200mm to 250 mm H<sub>2</sub>O & Normal Composition of CSF

##### n. LP considerations

- i. Positioning makes a difference
- ii. Fluoroscopic LP
- iii. Possibility of spinal headache
  1. May need blood patch

##### o. IIH Treatment

- i. WEIGHT LOSS (at least 6-10% of body weight)
  1. Diet / healthy eating habits, exercise
- ii. CARBONIC ANHYDRASE INHIBITORS
  1. acetazolamide (Diamox); usual starting dose of 1000 mg
  2. reduces CSF by 50% but may be unsustainable!
  3. Contraindicated in renal disease
- iii. Ventriculoperitoneal Shunt
- iv. Optic Nerve Sheath Fenestration

### **PAPILLEDEMA IN CHILDREN**

- A. OCT in papilledema
  - p. En face view of vitreoretinal interface to look for Paton's lines
  - q. Elevated average RNFL
    - i. Mean average RNFL in children is 107.6um
  - r. Deflection of Bruch's membrane
  
- B. Neurologic Testing can help localize mass
  - s. Cranial nerve testing
  - t. Sensory exam
  - u. Motor exam
  - v. Coordination
  
- C. Craniosynostosis – a cause of papilledema in kids
  - w. Early closure of skull sutures
  - x. Treatment: skull vault expansion surgery
  
- D. Pseudotumor Cerebri in kids
  - y. Does not follow the Modified Dandy criteria
  - z. In young kids, not associated with weight
  
- E. Idiopathic Intracranial Hypertension is ALWAYS a diagnosis of exclusion
  
- F. Papilledema is ALWAYS a medical emergency

## **Q&A / DISCUSSION**