5.4.12. Patient With Decreased Vision: Classification & Management (XII): Chiasmal Lesions

Introduction

- optic disc appearance
  - optic discs appear normal initially
  - even with significant visual field loss!
  - with progressive damage, optic discs show typical atrophy
  - often temporal
  - ± increased disc cupping
  - chiasmal compression almost never produces optic disc edema
- perimetry
  - gradually progressive, bilateral vision loss
  - often asymmetric!
  - peripheral (temporal) visual fields usually are involved first
  - in any case of bilateral visual field loss, evaluate perimetry results for respect of the vertical midline
- RAPD
  - only with markedly asymmetric visual field loss
- optic nerve disorders produce more central loss, with impaired visual acuity, dyschromatopsia, and an RAPD

Visual Field Loss Patterns

- junctional scotoma
  - lesions that injure an optic nerve at its junction with the optic chiasm
  - ipsilateral eye
  - central visual field loss
  - diminished visual acuity
  - opposite eye
  - temporal hemianopia

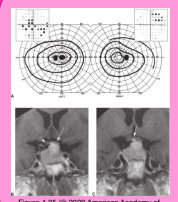
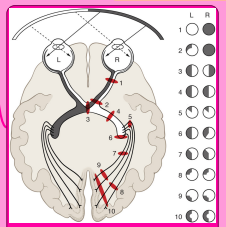


Figure 4-25 (© 2020 American Academy of Ophthalmology)

- unilateral temporal hemianopia
  - the mass compresses only the crossing nasal fibers from 1 eye
  - no involvement of the visual field in the opposite eye
  - respects the vertical midline!
- bitemporal hemianopia
  - most common visual field defect of chiasmal compression
  - relative or complete
  - may involve the paracentral temporal field alone
  - visual acuity is often unaffected until late



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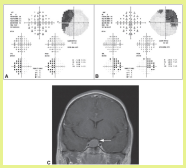
Extrinsic lesions affecting the chiasm

pituitary adenoma

- most common cause of chiasmal compression
- rare in childhood
- any adult age
- may enlarge during pregnancy



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- types
  - present with vision loss
  - nonsecreting tumors
  - present with systemic symptoms
  - hormonally active tumors

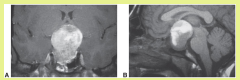


Figure 4-28 (© 2020 American Academy of Ophthalmology)

- acute hemorrhage or infarction of the pituitary tumor

pituitary apoplexy

- clinical presentation
  - severe headache
  - nausea
  - decreased level of consciousness
  - extravasation of blood into the subarachnoid space
  - vasospasm with secondary stroke
  - adrenal crisis
  - acute endocrine abnormalities
  - diplopia
  - central visual loss to no light perception vision
  - neuro-ophthalmic findings
  - visual field loss
  - CN III the most commonly affected
  - dysfunction of CNs III, IV, V, and VI
  - sudden expansion of the tumor into the adjacent cavernous sinuses
- treatment
  - potentially life-threatening!
  - recognition of pituitary apoplexy is crucial
  - immediate administration of corticosteroids
  - conservative management when neuro-ophthalmic signs are absent or mild
  - surgical decompression of the sella
  - appropriate supportive measures

etiology

- parasellar meningioma
  - middle-aged women
  - arise most frequently from the tuberculum sella, planum sphenoidale, or anterior clinoid
  - asymmetric bitemporal vision loss
  - may enlarge and produce chiasmal compression during pregnancy
- craniopharyngioma
  - common in children
  - may present at any age
  - second incidence peak in adulthood
  - unlike pituitary tumors
  - produce inferior bitemporal visual field loss
  - arise superiorly
- parasellar internal carotid artery aneurysm
  - markedly asymmetric chiasmal syndrome
  - optic nerve compression on the side of the aneurysm
- other CNS mass lesions
  - secondary posterior chiasmal compression
  - third-ventricle dilation

diagnostic workup

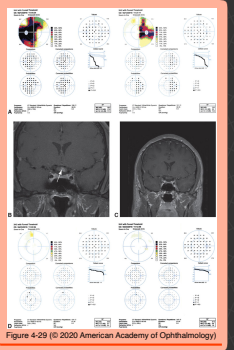
- 2–3 months after treatment (baseline)
  - visual field and visual acuity testing
  - repeat at intervals of 6–12 months
- periodic neuroimaging

treatment

- methods
  - if visual fields are normal
  - observation only
  - surgery (transfrontal or transsphenoidal)
    - within 24 hours
    - vision recovery is usually rapid
    - mean retinal nerve fiber layer thickness <75 µm is associated with poor visual prognosis
    - vision recovery may be dramatic, even with severe vision loss
  - medical therapy
    - bromocriptine or cabergoline for prolactin-secreting pituitary tumors
    - days to weeks
    - has a slower effect
    - produces tumor shrinkage and improved visual function in responsive cases
  - radiation therapy
    - primary or as adjunctive therapy for incompletely resectable tumors
- delayed vision loss after therapy for parasellar lesions
  - the first sign of recurrence may be vision loss
  - tumor recurrence
  - delayed radionecrosis of the chiasm or optic nerves
  - chiasmal distortion due to adhesions or secondary empty sella syndrome, with descent and traction on the chiasm
  - chiasmal compression from expansion of intraoperative overpacking of the sella with fat

Intrinsic lesions affecting the chiasm

- infectious (eg, tuberculosis, Lyme disease)
- inflammatory (eg, sarcoidosis, multiple sclerosis)



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- neoplasms can be either primary (eg, glioma) or secondary (eg, metastasis)
- significant closed-head trauma
- parasellar aneurysm rupture

Ophthalmology Mind Maps/Arman Mashayekhi, MD