Case discussion

A 40 y/o woman with diplopia for 1 week

報告人:PGY 林子揚
Supervisor: VS 楊毓錚
103.11.18

Patient profile

- Patient profile
  - Age: 40 y/o
  - Gender: Female
  - 就診時間: DAY1 18:15

主訴 & 檢傷

- 主訴
  - 最近覺得睡午覺睡太久，後腦會痛 / 看東西模糊
    - 已一星期
- 急診檢傷
  - GCS: E4V5M6
  - T/P/R: 36.1/77/15
  - BP: 132/62 mmHg
  - SpO2: 100%
  - Triage : IV
  - 急診眼科

Present illness

- Diplopia for 1 week
- Occipital pain
  - Intermittent
- No recent head trauma / neck manipulation
- No dizziness
- No fever
- No hyper/hypo-thyroidism

Past history

- Past history: 慢性肝炎
- CAD(-), HTN(-), DM(-)
- Allergy: NKDA
- Denied pregnancy

Physical examination

- HEENT:
  - Pupil: 3mm/3mm
  - No facial numbness
  - No tongue deviation
  - EOM limitation: right, lateral gaze

Physical examination

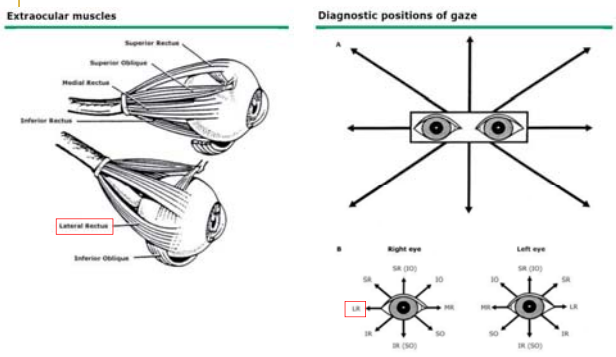
- Chest:
  - Clear breath sound
  - Regular heart beat
- Abdomen:
  - Soft
  - No tenderness
- Extremity:
  - No ataxia
  - No numbness
- NE:
  - F-N-F: no ataxia

Tentative diagnosis

- R/O right 6th cranial nerve palsy

中場Discussion

CN VI palsy: anatomy, causes & presentation

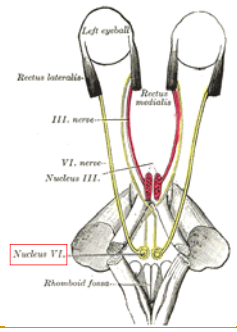


Actions of extraocular muscles

Nerve and muscle	Primary action	Secondary action	Tertiary action
Cranial nerve III			
Superior rectus	Elevation (maximal on lateral gaze)	Intorsion	Adduction
Inferior rectus	Depression (maximal on lateral gaze)	Extorsion	Adduction
Medial rectus	Adduction	None	None
Inferior oblique	Excyclotorsion	Elevation (maximal on medial gaze)	Abduction
Cranial nerve IV			
Superior oblique	Incyclotorsion	Depression (maximal on medial gaze)	Abduction
Cranial nerve VI			
Lateral rectus	Abduction	None	None

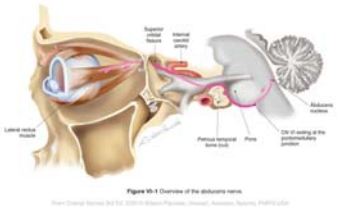
CN VI anatomy

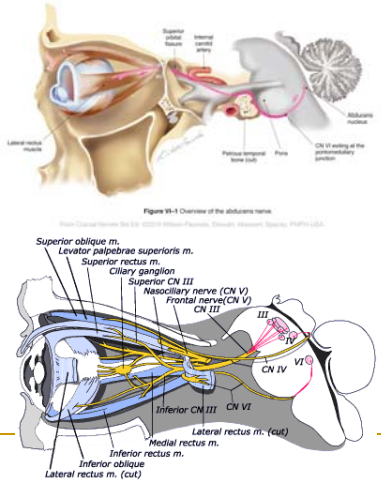
- Nucleus
  - Located in dorsal pons
    - Motor neurons:
      - Ipsilateral lateral rectus muscle
    - Inter-neurons:
      - Contralateral CN III medial rectus muscle subnucleus in midbrain



CN VI anatomy

- Nerve fascicle
  - Leave nucleus, travel within potine tegmentum
  - Leave brainstem at ponto-medullary junction
  - Enters the subarachnoid space (prepontine cistern)
  - Courses nearly vertically along the clivus
  - Travels over the petrous apex of the temporal bone
  - Enters the substance of the cavernous sinus
    - Lateral to the internal carotid artery
    - Medial to the ophthalmic division of the trigeminal nerve
  - Enters the orbit via the superior orbital fissure to innervate the lateral rectus muscle





The localization of abducens nerve lesions

Structure involved	Clinical presentation
Nuclear lesions	
Abducens nucleus	Horizontal gaze palsy
	Möbius syndrome (gaze palsy with facial diplegia)
	Duane retraction syndrome (gaze palsy with globe retraction and narrowing of palpebral fissure with adduction)
Dorsolateral pons	Foville syndrome (ipsilateral gaze palsy, facial paresis, dysmetria occasionally with contralateral hemiparesis)
Lesions of the abducens fascicle	
Abducens fascicle	Isolated CN VI palsy
Anterior paramedial pons	Ipsilateral CN VI palsy, ipsilateral CN VII palsy, contralateral hemiparesis (Millard-Gubler)
Prepontine cistern	May have contralateral hemiparesis
Lesion of abducens nerve (subarachnoid, petrous)	
Petrous apex (Dorello canal)	CN VI palsy, deafness, facial (especially retroorbital) pain (Gradenigo)
Cavernous sinus	Isolated CN VI palsy; CN VI palsy plus Horner syndrome; also may affect CN III, IV, V1
Superior orbital fissure syndrome	CN VI palsy with varible affection of CN III, IV, V1; proptosis
Orbit	CN VI palsy; visual loss; variable proptosis, chemosis, lid swelling

Causes of sixth nerve palsy

Nuclear lesions	Petrous apex lesions
Congenital (eg, Möbius syndrome)	Neoplasm
Demyelinating	Nasopharyngeal carcinoma
Ischemic	Infection or inflammatory
Neoplastic	Complicated otitis media or mastoiditis
Traumatic	Thrombosis of inferior petrosal sinus
Metabolic (Wernicke's disease)	Traumatic
Fascicular lesions	Basilar skull fracture
Demyelination	**Cavernous sinus lesions**
Infarction	Cavernous sinus thrombosis
Neoplasm	Cavernous sinus fistula
Traumatic	Neoplasm
Subarachnoid space lesions	Nasopharyngeal cancer
Aneurysm or other vascular abnormalities	Pituitary adenoma
Carcinomatous meningitis	Pharyngocele
Damage following procedures	Schiff nerve neuroma
Cervical traction	Skull base tumors
Shunting for hydrocephalus	Sphenoid sinus tumors
Spinal or epidural anesthesia	Squamous cell cancer of the pterygopalatine fossa
Lumbar puncture	Ischemic lesions
Myelography, radiculography	Inflammatory or infectious
Inflammatory lesions	Internal carotid artery aneurysm or dissection
Vasculitis	**Orbital lesions**
Sarcoidosis	Neoplastic
Systemic lupus erythematosus	Inflammatory
Infectious	Infectious
Lyme disease	Traumatic
Syphilis	
Tuberculosis	
Cryptococcal and other meningitis	
Cysticercosis	
HIV-CMV encephalitis	
Neoplastic	
Abducens nerve tumor	
Leukemia	
Metastatic	
Trigeminal nerve tumor	

CN VI palsy: common presentation

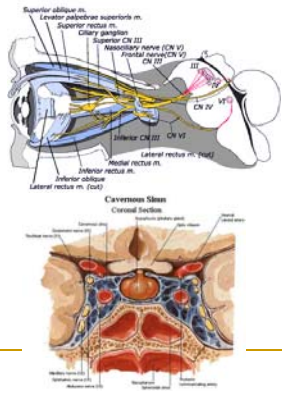
- Horizontal diplopia
- Esotropia (inward deviation)
  - Worsened with gaze into the field of the weak lateral rectus muscle
- Compensatory face turn
  - In the direction of the paralyzed muscle

CN VI palsy: common presentation

- Sudden onset of horizontal diplopia
  - Better at near and worse at a distance
- Minor pain over the affected eyebrow
  - At the onset of the double vision
  - No disturbing pain distributed over the forehead or face
- Other neurologic examination is normal
- Poorly controlled diabetes
  - 1 of the predisposing factors

CN VI palsy: special consideration

- Possibility of bilateral CN VI palsy before any other parts of brain was affected
  - Relative long, isolated course after CN VI exits brainstem
- CN V involvement
  - In the cavernous sinus
    - Reduced facial sensation
      - Upper face and cornea



CN VI palsy: prognosis

- King AJ et al (Spontaneous recovery rates for unilateral sixth nerve palsies. Eye (Lond) 1995; 9 (Pt 4):476.)
  - 213 patients with unilateral isolated CN VI palsy (trauma was excluded)
    - 78% spontaneous recovery
      - 37% by 8 weeks
      - 74% by 24 weeks
    - 16% failed to recover
      - 40% serious underlying pathology accounting for palsy

Diplopia: history taking - vision

- Binocular / Monocular diplopia?
  - Binocular:
    - Ocular misalignment
  - Monocular:
    - Local eye disease / Refractive error
- Relationship between field of gaze & diplopia
  - Double vision get worst
  - Double vision get closest together

Diplopia: history taking - vision

- Direction of separated images
  - Horizontal / Vertical / Oblique
- Any corrective head position?
- Double vision worse at distance / at near?
  - At distance:
    - Favor CN VI palsy
  - At near:
    - Favor medial rectus palsy

Diplopia: history taking - pain

- Location:
  - Generalized headache:
    - Ex: Diffuse intracranial pathology
  - Ipsilateral pain above the eyebrow:
    - Ex: Isolated CN lesion
  - Localized directly to the eye
    - Ex: Intraorbital lesion

Diplopia: history taking - pain

- Warning sign:
  - Sudden onset, worst ever
    - Ex: SAH
  - Severe pain, distributed at CN V1, V2 area, with sensory loss
    - Ex: Tumor pressing on CN V & CNs for EOM

Diplopia: history taking - tempo

- Good signs: (typical of idiopathic or ischemic etiologies)
  - Sudden onset, now plateaued
  - Gradual with steady worsening
  - Pain precede the palsy and resolve shortly after the palsy started
- Dynamic change: (typical of MG)
  - Motility problem change as the day goes on

Diplopia: physical examination

- Pupils
  - Warning sign: (aneurysm / tumor)
    - Dilated pupil + other dysfunction of CN III
- Other CNs?
  - Mono-neuropathy
    - Often idiopathic
  - Poly-neuropathy
    - Often need extensive workup
- Globe
  - Forward protrusion of eye? (Ex: Grave's disease)
- Ocular motility

Back to the patient

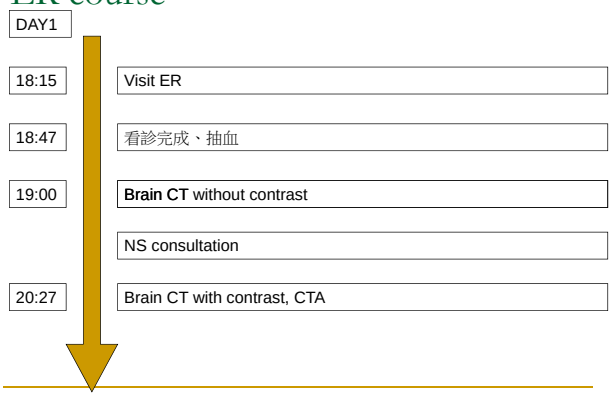
Image study

- CT without contrast
  - Isodense mass like lesion
    - ~2cm
    - At right prepontine cistern
    - With brain stem compression
  - R/I meningioma, DDx: neurogenic tumor
- CT with contrast
  - Homogenous enhancement of the lesion
  - Hemangioma is likely, r/o neurogenic tumor

Lab data

- CBC/DC/Plt
  - WBC: 6.0 k/uL, seg: 64.8%
  - Hb: 12.1
  - Plt: 250 k/uL
- BCS
  - Glucose: 85 mg/dL
  - AST: 13 U/L, Cre: 0.58 mg/dL, Na: 137 mmol/L, K: 3.5 mmol/L, iCa: 4.26 mg/dL
- PT/aPTT
  - PT: 11.3 sec, INR: 1.08
  - aPTT: 28.8 sec

ER course



ER course

DAY1

22:00 MBD, Compesolon 1# TID, NS OPD f/u

Loss of f/u…