Evaluation of Facial Weakness

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Disclosures:
1. I got nothing ...©

Evaluation of Facial Weakness

• Learning objectives:
  • Understand the important anatomic landscape surrounding the facial nerve
  • Discuss the common pathologies of the facial nerve
  • Review the imaging characteristics of common pathologies of the facial nerve

Evaluation of Facial Weakness

• Anatomy
  • Pathology

Facial Nerve Anatomy

• Segments:
  • Cisternal
  • Canicular
  • Labyrinthine
  • Geniculate
  • Tympanic
  • Mastoid
  • Extracranial

Facial Nerve Anatomy

• Mixed nerve
  • Branchial motor
  • Visceral motor
  • Special sensory
Facial Nerve Anatomy

- Branchial motor
- Facial expression
- Buccinator
- Platysma
- Occipitalis
- Stylohyoid
- Stapedius
- Posterior belly of the digastric

Facial Nerve Anatomy

- Branchial motor
- Visceral motor
- Lacrimal
- Submandibular
- Sublingual
Evaluation of Facial Weakness

- Anatomy
- Pathology

Normal Enhancement

Pontine Cavernous Malformation

Pontine Multiple Sclerosis
Temporal Bone Fracture

Facial Nerve Pathology

- Herpetic palsy
- Facial nerve schwannoma
- Hemangioma
- Perineural spread

Facial Nerve Pathology

- Herpetic palsy
  - Idiopathic acute onset lower motor neuron facial paralysis
  - Imaging
    - CT – normal facial nerve canal
    - MR – asymmetric, diffuse, intense enhancement of facial nerve, without focal nodularity

Facial Nerve Pathology

- Facial nerve schwannoma
  - Clinically – depends on location
  - Imaging – CT – tubular mass with bony scalloping, enlarging facial nerve canal
  - MR – avidly enhancing tubular mass, enlarging facial nerve canal

Facial Nerve Pathology

- IAC Facial nerve schwannoma
  - Fusiform enlargement of IAC
  - Uniform enhancement
  - DDx:
    - Vestibular schwannoma
    - Look for "tail" of enhancing tissue along labyrinthine segment on all acoustic schwannoma cases
Facial Nerve Pathology

- Labyrinthine facial nerve schwannoma
  - "Classic" radiologic appearance
  - Enlarged canal, scalloped walls, well circumscribed tubular enhancing lesion
  - DDx:
    - Congenital cholesteatoma
    - Perineural tumor spread

- Geniculate fossa facial nerve schwannoma
  - Bulbous lesion
    - If location of GSPN not considered, this lesion will not be included in the differential of middle cranial fossa mass
  - DDx:
    - Primary CNS tumor
    - Meningioma
Facial Nerve Pathology

- **Tympanic facial nerve schwannoma**
  - Lacks bony boundaries of labyrinthine segment
  - Can present as a pedunculated middle ear or retrotypanic mass with dehiscence
- **DDx:**
  - Congenital cholesteatoma
  - Atypical glomus tympanicum

Facial Nerve Pathology

- **Mastoid segment facial nerve schwannoma**
  - Location, location, location
    - Surrounding fragile thin walled air cells - lesions loses tubular nature
    - Aggressive appearing margins
- **DDX:**
  - Facial nerve hemangioma
  - Malignant perineural disease
Facial Nerve Pathology

- Vascular malformation (hemangioma)
  - Clinically – chronic, progressive, peripheral facial nerve paralysis
  - Imaging – CT - avidly enhancing mass with bony flecks, spiculated appearance, along facial nerve
  - MR – invasive appearing

- Perineural spread
  - Minor salivary gland tumors
  - Spread from parotid gland superiorly through stylomastoid foramen
  - Look for fat density/intensity at the stylomastoid foramen
Facial Nerve Perineural Tumor Spread

Internal Auditory Canal Dural Metastatic Disease

Internal Auditory Canal Pial Metastatic Disease

Herpes Zoster Oticus
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