Controversies in Otolaryngology: Evaluation and Management of Bell’s Palsy

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Grand Rounds Presentation
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Introduction

- Medical management controversial
  - Steroids
  - Antivirals
- Surgical management controversial
  - Decompression
- Clinical confusion
Bell’s Palsy

- Facial paralysis
  - Acute onset, limited duration, minimal symptoms, spontaneous recovery
  - Idiopathic in past
  - Diagnosis of exclusion
  - Most common diagnosis of acute facial paralysis
Etiology

- Past theories: vascular vs. viral
- McCormick (1972) – herpes simplex virus
- Murakami (1996)
  - 11/14 patients with HSV-1 in neural fluid
  - None in controls or Ramsay-Hunt syndrome
- Temporal bone section at autopsy
- Animal model inoculated with HSV-1
Natural History

- Peiterson (1982): 1011 patients
  - Every decade of life, mean between 40-44
  - 6-9% recurrent Bell’s palsy, M=W
  - Facial paresis (31%) -- 95% recover
  - Facial paralysis (69%)
    - 71% House-Brackmann grade I
    - 13% House-Brackmann grade II
    - 16% House-Brackmann grades III-V (fair-poor)
Natural History

- Delayed recovery over 3 months – all patients with sequelae
- No permanent House-Brackmann grade VI
- Overall, 85% recover to normal within one year without treatment
Evaluation

- Careful history – timing
  - Associated symptoms (pain, dysgeusia)
  - SNHL, vesicles, severe pain
  - Trauma, acute or chronic OM, recurrent
  - Exposures

- Physical exam
- Audiometry
- CT/MRI/other
- Topographic
- Electrophysiology
Anatomy

- Intracranial
- Meatal
- Labyrinthine (2-4 mm)
- Tympanic (11 mm)
- Mastoid (13 mm)
- Extracranial
Anatomy
Pathophysiology

- HSV viral reactivation leading to damage of facial nerve
  - Neuropraxia– no axonal discontinuity
  - Axonotmesis
    - Wallerian degeneration (distal to lesion)
    - Axoplasmic disruption, endoneural sheaths intact
  - Neurotmesis
    - Wallerian degeneration (distal to lesion)
    - Axon disrupted, loss of tubules, support cells destroyed
Electrophysiology

- Treatment plan based on 16% of patients who do not fully recover
- Several tests used for prognosis
  - Measure amounts of neural degeneration occurred distal to injury by measuring muscle response to electrical stimulus
  - NET, MST, ENoG, EMG
  - Able to differentiate nerve fibers undergoing Wallerian degeneration
Electrophysiology

- **NET (nerve excitability test)**
  - Hilger first described in 1964
  - Compares current thresholds to elicit minimal muscle contraction
  - 3.5 mA difference significant

- **MST (maximum stimulation test)**
  - Compares responses generated with maximal electrical stimulation judged as difference in facial movement
  - Absent or markedly decreased significant
Electrophysiology

- ENoG (electroneuronography)
  - Most accurate, objective
  - Records summation potential (CAP)
  - Degree of degeneration is directly proportional to amplitudes of measured potentials
  - Done after Wallerian degeneration starts (3-4 days)
  - Compare each day
Electrophysiology
Electrophysiology

- ENoG
  - Esslen (1977) – over 90% degeneration on ENoG prognosis worsens
    - 90-97%: 30% recover fully
    - 98-99%: 14% recovery fully
    - 100%: none recovered fully
  - Fisch (1981)
    - 50% with 95-100% degeneration by 14 days have poor recovery
    - High likelihood of further degeneration if reaches 90%
    - Thus, if ENoG reaches 90% within 2 weeks: 50-50 recovery
Electrophysiology

- EMG (electromyography)
  - Not useful in acute phase except as complementary test
  - Will be flat with neuropraxia, 100% degeneration, and early regeneration
  - Key in long-term evaluation (over 3 weeks)
    - Fibrillation potentials—degeneration
    - Polyphasic motor units—regenerating nerve
Medical Management

- Eye protection
- Steroids
  - Stankiewitz (1987) – no efficacy
  - Austin (1993) – randomized, double blind, placebo controlled study
    - Improvement in grade with prednisone
    - All with prednisone (House 1-2)
    - 17% without House 3 (statistically significant)
    - Trend towards denervation protection
Medical Management

- Antivirals
  - Adour (1996)– double blind
    - Only 20% progressed to complete paralysis
    - Acyclovir had less degrees of facial weakness
    - Acyclovir had lower incidence of House 3-5

- Conclusions
Surgical Management

- Spirited debate over years
  - No surgery
  - Immediate decompression when complete
- Balance and Duel (1932)– first surgery
- McNeill (1970)– no benefit (geniculate to stylomastoid foramen)– after 14 days
Surgical Management

- Fisch and Esslen (1972)– 12 patients
  - Total facial nerve decompression via middle cranial fossa and transmastoid
  - Found conduction block at meatal foramen (94% patients)
- Fisch (1981)
  - Decompression within 14 days for 90% degeneration for maximum benefit
- May (1979)
  - Transmastoid decompression beneficial (decreased SF, Schirmer’s, MST reduced)
- May (1984)
  - No patients benefited from surgery within 14 days
Surgical Management

- Gantz (1999) – multi-institutional review
  - Assess if patients with degeneration over 90% within 14 days would benefit
  - Middle cranial fossa (meatal foramen to tympanic segment)
  - If conductive block not identified (6%) – transmastoid added
  - 92% with surgery recovered to House 1-2
  - 45% without surgery to House 1-2
Case Study

- 50 yo male presents with one day history of “my face isn’t moving”
Case Study

- 50 yo male presents with one day history of “my face isn’t moving”
  - Occurred overnight
  - No ear pain, previous viral illness
  - No hearing loss
  - No prior history, no family history
  - No other associated symptoms
Case Study

- PMH: HTN
- PSH: appendectomy
- Meds: HTN meds
- SH: no tobacco or Etoh
- FH: no family history of similar events
- ROS: N/C
Case Study

- Physical examination
  - Ears normal, ?hyperemia of chorda on R
  - Face with complete paralysis on right, uniform
  - Remainder of exam normal
Case Study

Physical examination

- Ears normal, ?hyperemia of chorda on R
- Face with complete paralysis on right, uniform
- Remainder of exam normal
- Audiogram normal
Case Study
Case Study
Case Study
Case Study

RESULTS ARE AND SUGGESTIONS DELAYED OR REACTING INCOMPLETELY VARYING RECOVERY

LATENCY 4.00 ms/div

A1 62.5µV
A2 62.5µV
A3 62.5µV
A4 62.5µV
A5 62.5µV
A6 62.5µV
Case Study
Case Study