Evaluation and Management of Drooling

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Drooling

- Drooling - serious medical and social problem
  - maceration, infection, soiling of clothes and belongings, effects on caregiver
- Sialorrhea - increase in salivary flow
- Drooling - ineffective saliva management
Anatomy and Physiology of Drooling

- Three pairs of major salivary glands - parotid, submandibular, and lingual
- 70% of saliva comes from the submandibular glands at the resting state
- Ingestion of food causes parotid gland to secrete a higher percentage of saliva
Submandibular and Sublingual gland innervation

- Superior salivatory nucleus - nervus intermedius - facial nerve - chorda tympani - lingual nerve - submandibular ganglion - submandibular/lingual glands
Parotid innervation

- Inferior salivatory nucleus - glossopharyngeal nerve - Jacobsen’s nerve - lesser superficial petrosal nerve - otic ganglion - auriculotemporal nerve
Salivary gland innervation

- Parasympathetic system stimulation causes an increase in saliva flow from all glands.
- Sympathetic system stimulation causes increase in saliva flow from submandibular gland but has no effect on parotid flow.
Functions of saliva

- Protective
- Swallowing
- Digestion
- Speaking
**Etiology of Drooling**

- **Acute vs. Chronic**
  - acute - epiglottitis, neoplasm, abscess
  - chronic - neurological (cerebral palsy) most common; usually related to head control

- **Direct vs. Indirect**
  - direct - directly interferes with muscle tone or gland stimulation (anticholinesterase)
  - indirect - macroglossia
Pathophysiology of Drooling

- Multifactorial
- Primarily a defect in the oral phase of swallowing caused by:
  - poor head control, inability to close the mouth, abnormal tongue mobility, reduced intra-oral sensation
- Sialorrhea can lead to drooling caused by:
  - medications and poor fitting dentures
Diagnosis of Drooling

- **History** - severity, peak time, influencing factors, associated conditions, parental expectations, age and mental status of the patient
- **Physical** - Head posture, dental abnormalities, nasal and oral cavities, decreased intraoral sensitivity
- **Other** - lateral neck x-ray, audio, barium sw.
Treatment Options

- Pharmacological therapy
- Speech therapy
- Behavioral therapy
- Radiation therapy
- Surgery
- Initial approach is usually nonsurgical and reversible
Pharmacological therapy

- Anticholinergic - Robinul
  - side effects - restlessness, sedation, constipation, urinary retention, blurred vision, xerostomia

- Antihistamine

- Antireflux
Speech therapy

- Goal is to improve jaw stability and closure, increase tongue mobility, improve lip closure, decrease nasal regurgitation
- Usually not a significant impact as sole tx.
- Begin early (infancy)
- Limited results in severely retarded
- Prosthetic devices - chin cup
Behavioral therapy

- Cueing, overcorrection, positive and negative feedback
- Three phases: cognitive, fixation, and autonomous
- Not used widely because time intensive and requires certain intelligence level
- Regression can occur after cessation of tx
Radiotherapy

- 6000 rad
- Side effects: xerostomia, mucositis, caries, osteoradionecrosis, development of radiation induced malignancy
- Relapse rate - 5/32 patients relapsed within 6 months
Surgical options

- Submandibular duct rerouting
- Submandibular duct excision
- Parotid duct ligation
- Transtymppanic neurectomy
Surgical indications

- Age 5-6
- Assess ability to interact with peers
- Failed nonsurgical management
- Stable neurological status
Rerouting of submandibular duct

- Success rate of 80-100%
- Cuff of mucosa dissected around duct and marked medially and laterally
- Duct dissected 3-4 cm or until gland reached
- Tonsil used to create a tunnel just posterior to anterior tonsillar pillar and sutures passed with duct
Rerouting of submandibular duct (cont’d)

- Tonsillectomy performed if obstructive tonsils
- Sublingual adenectomy (Crysdale) versus ligating sublingual ductules (Cotton)
- Advantages: Decreased xerostomia, problems with taste and dysphagia
- Disadv: Ranula, FOM swelling, sialoadenitis, sialolithiasis, aspiration
Studies on submandibular duct rerouting

- Crysdale - 8% ranula rate
- O’Dywer - 15 year follow-up study, 94% of parents stated their child benefited, 50% had complete cessation of drooling
Submandibular Gland Excision

- Performed if rerouting fails or high risk for aspiration
- Done in the standard fashion through neck incision
- Can be done with or without parotid duct ligation
- High success rate (approx. 85%)
Parotid duct ligation

- If combined with submandibular gland excision can lead to significant xerostomia
- Elliptical incision made around the parotid duct. Duct dissected for 1 cm, suture ligated and resected. The buccal mucosa is then repaired.
- Can lead to parotitis, sialolithiasis
Transtympanic neurectomies

- 80% success rate quoted
- Must take both chorda and tympanic plexus
- Hypotympanic branch in 50% of patients
- Low speed drill
- Loss of taste in anterior 2/3 of tongue and xerostomia
- Contraindicated in unilateral SNHL
Summary

- Goal: decrease drooling and provide healthy oral cavity
- Order of management controversial
  - Nonsurgical management first
  - Submandibular duct rerouting
  - Submandibular gland excision +/- parotid duct ligation
  - Tympanic neurectomy