Approaches to the Sphenoid

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Grand Rounds Presentation
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Development

- Originate in 4\textsuperscript{th} fetal month from sphenoethmoidal recess
- Pneumatization begins at age 3
- Adult size at 18
Sphenoid Sinus

- *Congdon*
  - Conchal – 5%
  - Presellar – 23%
  - Sellar – 67%
Sphenoid Sinus

- Irregular walls
- Asymmetric
- Dehiscences
Sphenoid Sinus

- **Superior**
  - Hypophysis, olfactory tract, frontal lobe
- **Inferior**
  - Nasopharynx, vidian nerve
- **Lateral**
  - Cavernous sinus, carotid, cranial nerves 2/3/4/5/6
- **Posterior**
  - Pons, basilar artery
Sphenoid Sinus

Van Alyea

Elevations

- Carotid - 65%
- Optic nerve - 47%
- Vidian nerve - 48%
- Maxillary nerve - 42%
Sphenoid Sinus

- 7 cm to anterior face
- 9 cm to post wall
- 30 degrees from floor
Sphenoid sinus
Sphenoid Sinus
Sphenoid Sinus
Sphenoid Sinus - symptoms

- Headache
  - retroorbital
- Visual symptoms
- Paresthesias/Palsies
Sinusitis

- Dull headache
- Nasal discharge
- Visual symptoms

Management
- Decongestants
- Antibiotics
- Irrigation
- Surgery
Mucocele

- MC space occupying lesion
- Headaches
- Visual disturbances
- Radiographs
- Sinusotony
Polyps

- Usually associated with ethmoidal disease
- Can be confined to sphenoid

History
- Hx rhinosinusitis
- PND
- HA

Radiographs
Inverting Papilloma

- Primaries from sphenoid reported
- Recurrence likely
Malignant lesions

- SCCa
- Adenocarcinoma
- Lymphoepithelioma
- Melanoma
- Sarcoma
Pituitary tumors

- Basophilic, acidophilic, chromophobic
- Prolactin  40-50%
- GH  15-25%
- ACTH  5%
- TSH/GnRH  1%
- Multiple  15-20%
Pituitary tumors
Craniopharyngiomas

- Bimodal presentation
- Cystic or solid
- Compression
- Recurrence rate high
Other

- Dermoids
- Epidermoids
- Germ cell tumors
- Chordomas
- Osseous lesions
- Meningiomas
- Encephaloceles
Evaluation

- History & Physical
- Endoscopic exam
- Radiography
  - CT
  - MRI
  - Angiography
- Endocrine evaluation
Approaches

- Krause – 1905 – transfrontal
- Schloffer – 1907 – transnasal
- Cushing – 1910 – sublabial transseptal
- Cushing – 1920s – extracranial
- Hardy – 1960s – transseptal
Sublabial Transseptal

- Transfixion incision
- Mucoperiosteal tunnels elevated
- Cartilage separated from max crest
- Sublabial incision
- Anterior wall wall removed
Sublabial Transseptal
Sublabial Transseptal

- Fibrous Tissue Binds Mucosa To Osseo-Cartilaginous Joint
- Left Anterior-Posterior And Left Inferior Tunnels Joined
- Right And Left Inferior Tunnels
- Incision In Fibrous Tissue Binding Mucosa To Premaxilla
- Mucosa Not Shown To Highlight Dissection
- Horizontal Bone Cuts In Septum
Sublabial Transseptal

Sublabial Incision
Canine Fossa To
Canine Fossa

Reflected
Cartilage And
Mucosa

Pyriform
Aperture
Sublabial Transseptal

- Osteotome To Open Anterior Sphenoid Wall
- Mucosa Not Shown To Highlight Dissection
- Hypophysectomy Speculum In Space Between Septal Mucosal Flaps
- Osteotomy In Midportion Of Anterior Sphenoid Wall
- Anterior View Of Midline Path To Sphenoid Rostrum
Endoscopic Transseptal

- Lateralize middle turbinate
- Expose SER/ostium
- Posterior incision on vomer
- Mucoperiosteal flaps
- Remove anterior wall of sinus
External Rhinoplasty

- No sublabial dissection
- Inverted V incision
- Divide intercural ligaments
- Mucoperichondrial tunnels
- Remove posterior septum
- Anterior wall removed
External Rhinoplasty
External Rhinoplasty

- Peters and Zitsch
  - Incisions at base of columella and complete transfixion incision
Intranasal Transseptal

- Various septal incisions
- Lateral alotomy
Prior septal surgery

1) Avoid problem area
2) Dissection through problem area
3) Lateral displacement of septum
Lateral septal displacement

- Incision on nasal floor
- Complete transfixion incision
- Elevation of floor mucosa bilaterally
- Dissect septum from nasal spine/crest until intact bone reached
- Normal sequence
Lateral septal displacement
Transantral approach

- Caldwell-Luc
- Medial wall of antrum removed
- Ethmoidectomies
- Anterior wall reached
- No nasal complications
Transethmoidal approach

- External ethmoidectomy approach to anterior wall of sphenoid
- No nasal complications
Transethmoidal approach
Transethmoidal approach
Endoscopic sphenoid approach

- Middle turbinate medialized
- Ant & post inferior turb removed
- Posterior ethmoidectomy thru grand lamella
- Open ostium
Endoscopic sphenoid approach
Endoscopic sphenoid approach
Endoscopic sphenoid approach
Intranasal sphenoethmoidectomy

- Medialization of turbinate
- Anterior – posterior ethmoidectomies
- Lateralize turbinate
- Ostium post-sup of post attachment of middle turbinate
- Anterior wall removed
Transantral sphenoethmoidectomy

- Caldwell-Luc
- Medial wall of antrum removed
- Ethmoidectomies
- Sphenoidectomy
Transpalatal approach

- Mouth gag
- Palatal incision
  - Midline split
  - U or S incisions
- Hard palate removed
- Closed in several layers
- Complications
  - Palatal contracture, VPI, fistulae
Transpalatal approach
Infratemporal approach

- Sphenoid sinus neoplasms
  - Cavernous sinus
  - Pterygomaxillary space
  - Infratemporal fossa
  - Nasopharynx

+-/- craniotomy
Infratemporal approach
Infratemporal approach
Anterior approach

- Facial incision
  - Lateral rhinotomy
  - Weber-Fergusson incision
- +/- orbital exenteration
- Ant/med maxillary walls removed
- Ethmoidectomies
- Sphenoidectomy
- Drill sphenoid sinus walls
Anterior approach
Neurovascular complications

- Carotid artery
  - Laceration, spasm
- Cavernous sinus
- Nerve palsies
- Blindness
- Optic chiasm
  - Prolapse into sella
  - Chiasmal compression
- CSF leaks
  - Meningitis
Rhinologic complications

- 50%?
- Septal perforations
- Epistaxis
- Synechiae
- Anosmia
- Cosmetic deformity
  - Columellar incision visibility
  - Saddle nose
  - Loss of tip projection/decreased nasolabial angle