Atrophic Rhinitis

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Atrophic Rhinitis

- Common Terms
  - Ozena
  - Dry Rhinitis
  - Rhinitis Sicca
Atrophic Rhinitis

  - 1) Accidental or Simple Ozoena
    - “due to the retention of mucous.”
    - “easily dealt with by the frequent employment of the nasal douche ...”
  - 2) Idiopathic or constitutional
    - “commences in early childhood ... And remains during the early years or throughout the whole adult life.”
    - “The patient is generally anosmic ... and he is, therefore, unaware of the offensive odor of his breath.”
    - “The nature of the inflammatory process is very probably allied to that of lupus erythematous of the face.”
  - 3) Syphilitic Ozoena
    - “the most common form”
    - “These ulcers may be preceded or followed by caries or necrosis of the bones, and the stench is then more horribly sickening than in any other form of this disgusting malady.”
Atrophic Rhinitis

- Described in 1876 by Dr. Bernhard Fraenkel as a triad of:
  - Fetor
  - Crusting
  - Atrophy of nasal structures

  - “the breath is often so penetrating as to render the near presence of the sufferer not only unpleasant but almost unendurable.”
Atrophic Rhinitis

- **Clinical Features**
  - Anosmia
  - Ozena, i.e. foul odor
  - Extensive nasal crusting
  - Subjective nasal congestion
  - Enlargement of the nasal cavity
  - Resorption or absence of turbinates
  - Squamous metaplasia of nasal mucosa
  - Depression
Atrophic rhinitis

- **Primary**
  - History of prior sinus surgery, radiation, granulomatous disease, or nasal trauma are exclusions.
  - Primary AR is rare in the US
  - Most cases are reported in China, Egypt, and India
  - Microbiology of primary AR is almost uniformly *Klebsiella ozenae*.
  - Radiographic and clinical features similar to secondary AR.
Atrophic rhinitis

- Secondary
  - Complication of sinus surgery (89%)
  - Complication of radiation (2.5%)
  - Following nasal trauma (1%)
  - Sequela of granulomatous diseases (1%)
    - Sarcoid
    - Leprosy
    - Rhinoscleroma
  - Sequelae of other infectious processes
    - Tuberculosis
    - Syphilis

Surgical causes

- Based on review of 242 cases from Mayo Clinic.
  - Procedures per patient
    - 2.3
  - Partial middle or inferior turbinectomy
    - 56%
  - Total middle and inferior turbinectomy
    - 24%
  - No turbinectomy
    - 10%
  - Partial maxillectomy
    - 6%

Other suggested causes

- Infectious (Ssali)
  - Case report of AR developed in 7 children of one family after contact with another known AR child.

- Dietary
  - (Bernat) Iron therapy found to benefit 50% of patients treated
  - (Han-Sen) Hypocholesterolemia present in 50% of patients.
  - (Han-Sen) Vitamin A therapy showed symptomatic improvement in 84%.

- Hereditary (Barton, Sibert)
  - Proposed autosomal dominant disease due to father and 8 of 15 children contracting the disease.

- Hormonal
  - Symptoms known to worsen with menstruation or pregnancy.

- Developmental (Haggrass)
  - Radiologic evidence of poor maxillary antrum pneumatization and short nasal lengths

- Vascular (Ruskin)
  - Postulated overactivation of sympathetic activity.

- Environmental (Mickiewicz)
  - Chronic exposure to phosphorite and apatide dust

- Autoimmune (Ricci)
Physical findings

- Crusting
  - 100% Present

- Inferior Turbinates
  - 62% Partial absence
  - 37% Total absence

- Middle Turbinates
  - 57% Absent

- Discharge
  - 52% Present

- Septum
  - 10% Perforations

Radiographic Findings

1. Mucoperiosteal thickening of the paranasal sinuses.

2. Loss of definition of the OMC secondary to resorption of the ethmoid bulla and uncinate process.

3. Hypoplasia of the maxillary sinuses.

4. Enlargement of the nasal cavities with erosion and bowing of the lateral nasal wall.

5. Bony resorption and mucosal atrophy of the inferior and middle turbinates.

Biopsy Findings

- Normal Mucosa
  - Pseudostratified Columnar
  - Presence of serous and mucous glands

- Atrophic Rhinitis
  - Squamous metaplasia
  - Atrophy of mucous glands
  - Scarce or absent cilia
  - Endarteritis obliterans
Microbiology

- **Klebsiella ozenae**
  - May be found in almost 100% of primary AR
  - No predominance in secondary AR
- *Staphylococcus aureus*
- *Proteus mirabilis*
- *Escherichia coli*
- *Corynebacterium diphtheriae*
Current Therapies

- **Goals of therapy**
  - Restore nasal hydration
  - Minimize crusting and debris

- **Therapy options**
  - Topical therapy
  - Saline irrigations
  - Antibiotic irrigations
  - Systemic antibiotics
  - Implants to fill nasal volume
  - Closure of the nostrils
Local therapy

- **Irrigations**
  - Saline
  - Mixtures
    - Sodium bicarbonate
    - Shehata: Sodium Carbonate 25g, Sodium Biborate 25g, and Sodium Chloride 50g in 250ml water.
  - Antibiotic solution
    - Moore: Gentamycin solution 80mg/L

- **Anti-drying agents**
  - Glycerine
  - Mineral Oil
  - Paraffin with 2% Menthol

- **Other**
  - Acetylcholine
  - Pilocarpine
Systemic therapy

- Oral antibiotics
  - Tetracycline
  - Ciprofloxacin
  - Aminoglycosides
  - Streptomycin injections

- Medication avoidance
  - Vasoconstrictors
  - Topical steroids *

- Other
  - Vitamin A (12,500 to 15,000 Units daily)
  - Potassium Iodide (Increases nasal secretions)
  - Vasodilators
  - Iron therapy
  - Estrogen
  - Corticosteroids *

- Vaccines
  - Antibacterial (Pasturella, Bordetella)
  - Autogenous
Surgical therapies

- Young procedure
- Modified Young procedure
- Turbinate reconstruction
- Volume reduction procedures
- Denervating operations
Nasal Closure

- Young’s procedure
  - Circumferential flap elevation 1 cm cephalic to the alar rim.
  - Sutures placed in center of elevated flap to close the nostril
  - Staged second side in 3 months

- Advantages
  - Often provided relief of symptoms

- Disadvantages
  - Difficult to elevate circumferential flap
  - Breakdown of central suture area common
  - Does not allow for cleaning
  - Did not allow for periodic examination
  - Recurrence after flap takedown

Nasal Closure

- Modified Young’s
  - Elevation of extended perichondrial flap through contralateral hemitransfixion incision.
  - Short skin flap elevated from the intercartilaginous line on the ipsilateral side.
  - Suture lateral and medial flaps with vicryl.
  - Staged second side with first side takedown in 6 mon.

- Advantages
  - Technically easier than Young procedure
  - No suture line breakdown
  - No vestibular stenosis on takedown

- Disadvantages
  - Not possible with large septal defects
  - Does not allow for cleaning
  - Does not allow for periodic examination
  - Recurrence after flap takedown

Volume reduction

- **Plastipore implantation**
  - Porus material allows tissue ingrowth.
  - Implants shaped then fenestrated for ingrowth.
  - Implants placed submucosally along the septum and nasal floor.

- **Advantages**
  - Easier than other surgical options (Young’s)
  - Plastipore has low extrusion/complication rate
  - May be done under local anesthesia

- **Disadvantages**
  - Possibility of extrusion (occurred in 1/8 pts)
  - Requires septal mucosa (not discussed)

Plastipore
Volume Reduction (cont)

- **Triosite and Fibrin**
  - Triosite (60% hydroxyapatite, 40% calcium triphosphate) mixed with Fibrin 1:1.
  - Deglove the labial vestibule
  - Elevate periosteum of the floor posteriorly to the end of the hard palate, extend medially onto the septum.
  - Insert Triosite & Fibrin mixture (~3.3g per side)

- **Advantages**
  - Good to excellent result (7/9 patients)
  - Material can be molded easily

- **Disadvantages**
  - Leakage of material (4/9 patients)
  - Infection of material (3/9 patients)
  - Potential damage to lacrimal system

Triosite and Fibrin

Triosite and Fibrin
Other Therapies

Non-surgical nasal closure
- Nasal vestibule impressions taken similar to hearing aid moulds.
- Impressions are used to create a silastic obturator.

- Advantages
  - Reversible
  - Easily removed
  - Allows for irrigations
  - Allows for serial clinical exams
  - Avoids surgical morbidity

- Disadvantages
  - May be uncomfortable
  - May cause sore throat due to obligate mouth breathing.

Nasal Obturator
Other Therapies

- **Other Implants**
  - Acrylic
  - Silicone
  - Teflon
  - Silastic
  - Boplant

- **Denervation**
  - Cervical sympathectomy (Bertein)
  - Stellate ganglion block (Bahl)
  - Sphenopalatine ganglion block (Girgis)
  - Parasympathectomy, i.e. GSPN section (Krmptotic)

- **Salivary Irrigation**
  - Involves reimplantation of parotid duct into the maxillary sinus

- **Accupuncture**

- **Time**
  - Disease often resolves spontaneously after age 40


