Reading a Sinus CT: A Step by Step Guide

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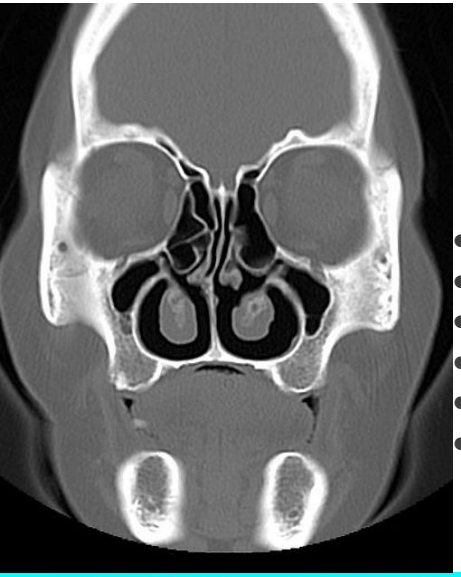
Disclosure

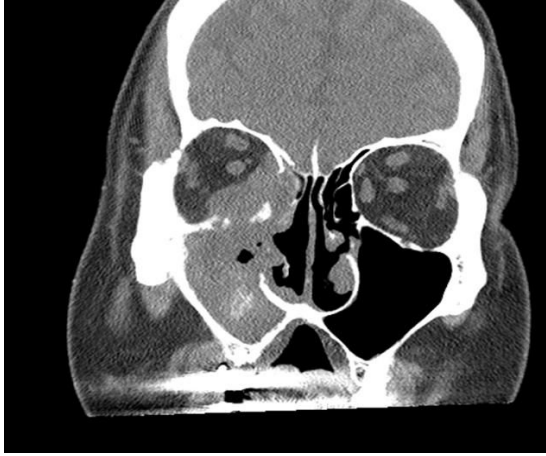
I have NO financial disclosure or conflicts of interest with the presentation material in this presentation.

Objectives

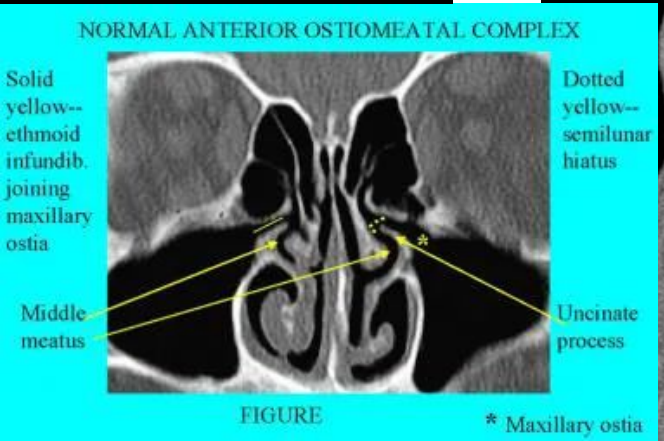
1. Review nasal and sinus anatomy
2. Review anatomy variants
3. Discuss most common pathology
4. Discuss alarming sinus CT scans
5. Discuss in office procedures that would help with common nasal/sinus pathologies found on sinus CT scans



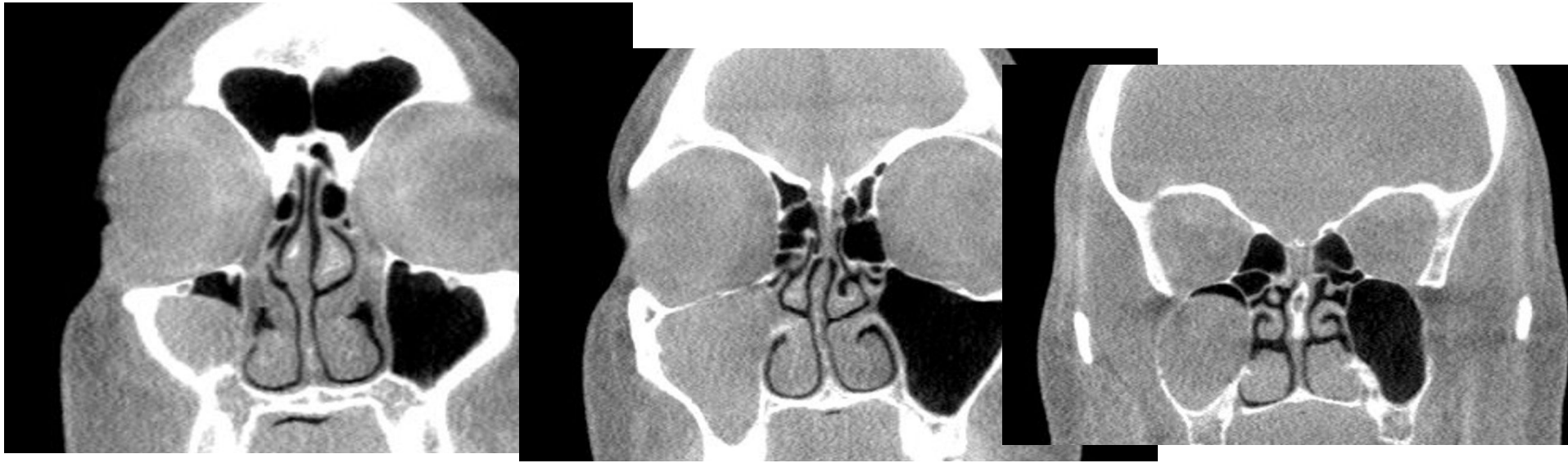
Maxillary Sinus



- Aeration
- Wall thickening or thinning or destruction
- Ostiomeatal complex
- Retromaxillary fat/PPF
- Variant: Hypoplasia
- Pathology on the slide related to maxillary sinuses: nasal polyps, ostiomeatal complex obstruction, chronic sinusitis, acute invasive fungal sinusitis

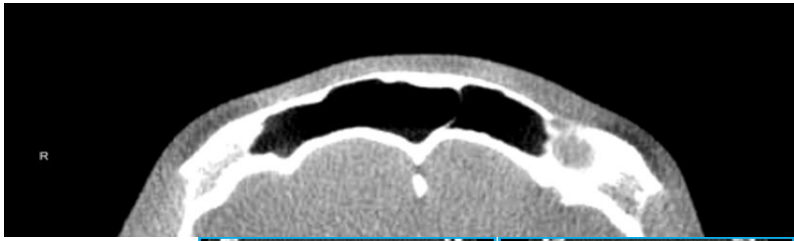


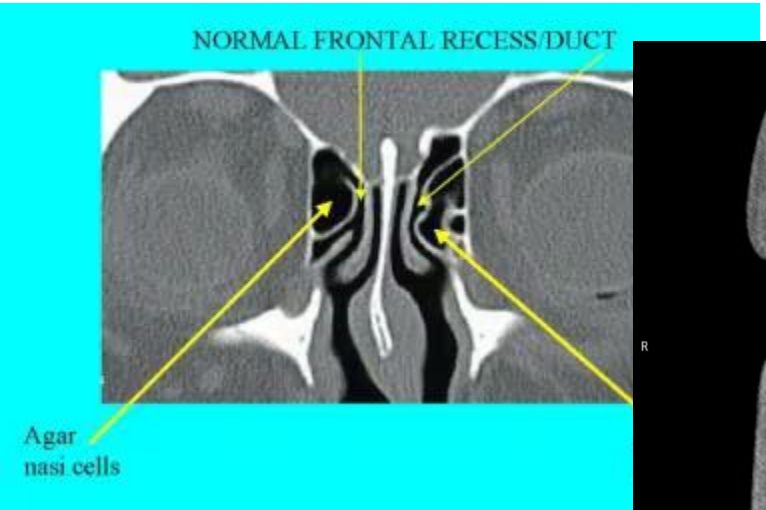
Maxillary Sinus Cyst

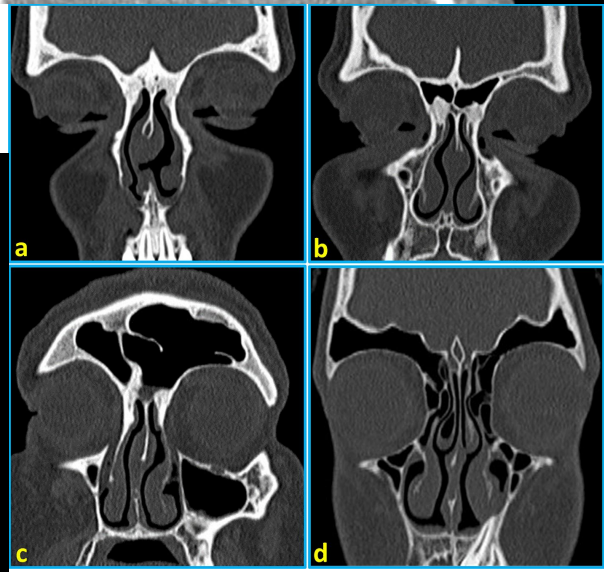


Frontal Sinus

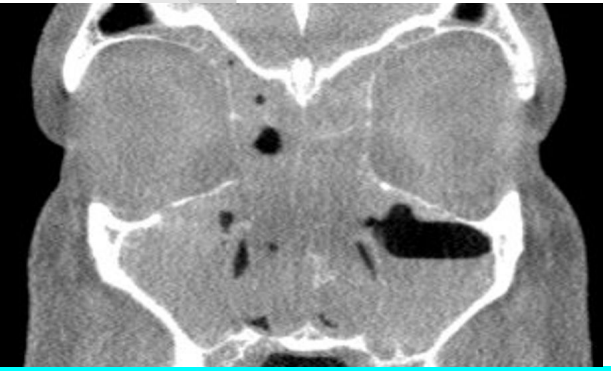
- Aeration
- Wall thickening, thinning, destruction
- Frontoethmoidal recess
- Variants: Aplasia, hypoplasia, hyperplasia
- Pathology on the slide related to frontal sinuses: nasal polyps, frontoethmoidal recess obstruction, chronic sinusitis,



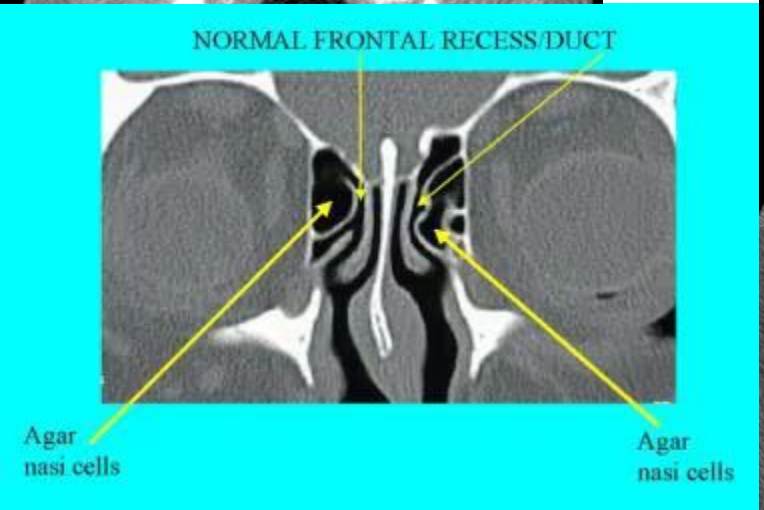


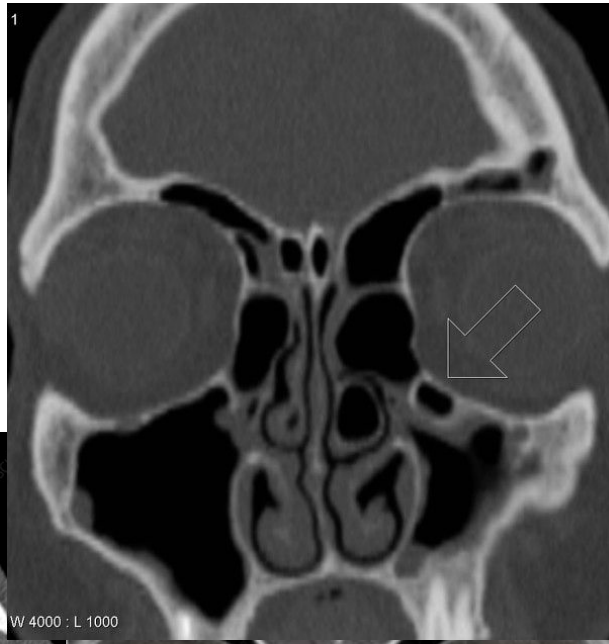


Ethmoid Sinus



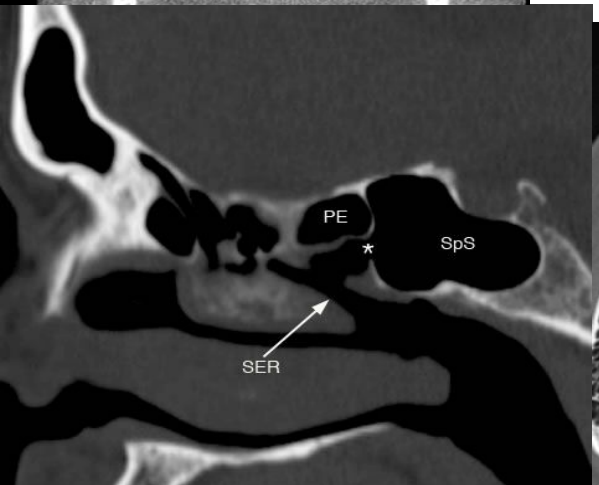
- Aeration
- Variant: Haller cells
- Variant: Agger Nasi Cells
- Adjacent Structures: Orbit
- Pathology on the slide related to ethmoid sinuses: nasal polyps, chronic sinusitis, OMC obstruction

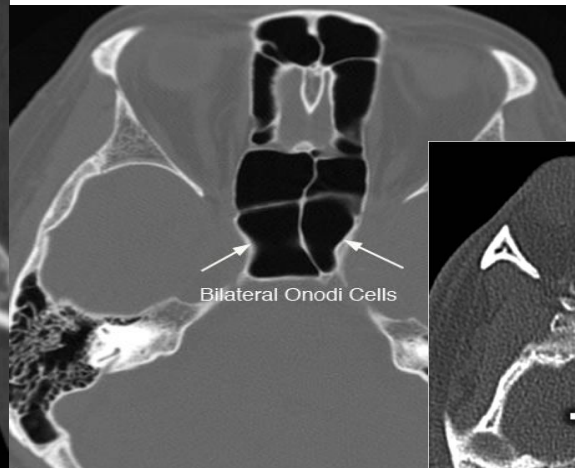


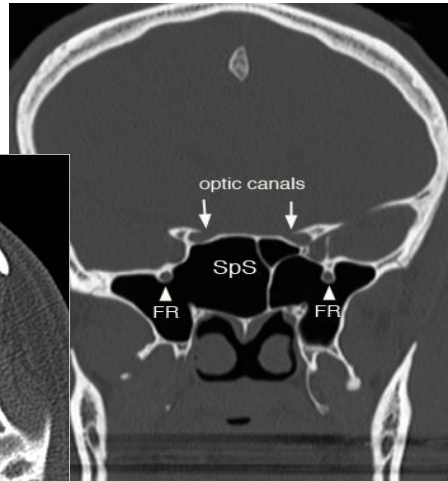


Sphenoid Sinus

- Aeration
- Wall thickening, thinning, destruction
- Sphenoethmoidal recess
- Adjacent structures: internal carotid arteries, sella turcica (depression in the sphenoid bone at the base of the skull that houses the pituitary gland), clivus (sloping, bony surface located at the base of the skull, extends from the sphenoid bone to the occipital bone and forms the posterior part of the sell turcica, which houses the pituitary gland.)
- Pathology on the slide related to sphenoid sinuses: nasal polyps, sphenoethmoidal recess obstructio chronic sinusitis,
- Variant: Onodi Cells (contigous extension of the posterior ethmoid air cells into the sphenoid sinus and are closely associated with the optic nerve. Due to their close association with the optic nerve the nerve can be at increased risk of injury during sinus surgery.)

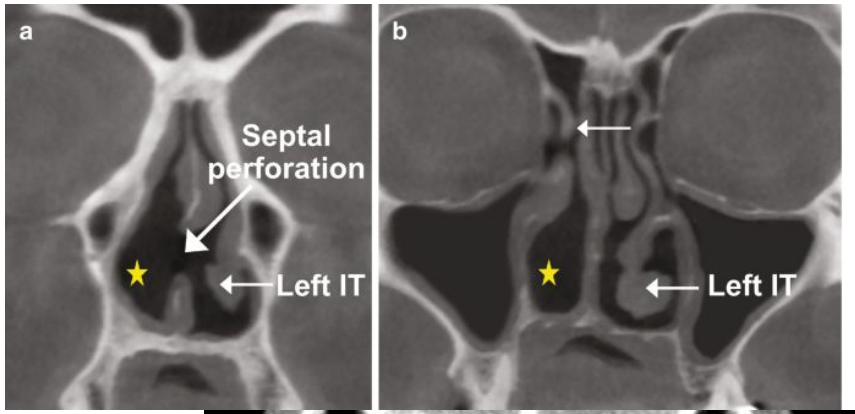


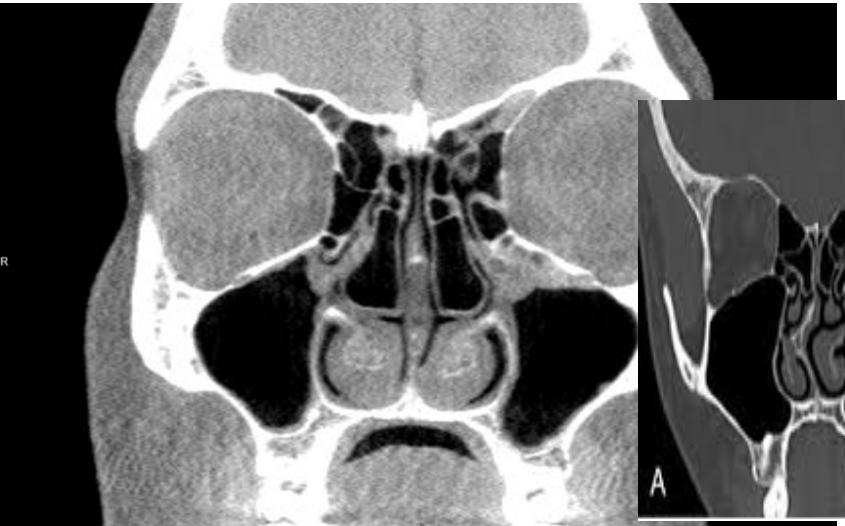


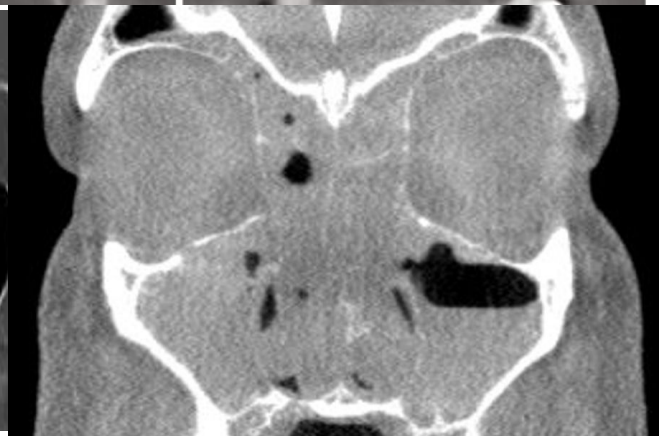


Nasal Cavity

- Nasal Septum
- Turbinates
- Nasal Polyps
- Pathology on the slide related to septum and turbinates and nasal passages: Concha bullosa, septal bone spur, perforated septum, nasal polyps, enlarged turbinates



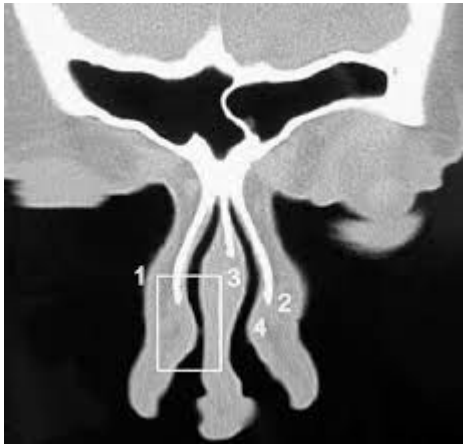


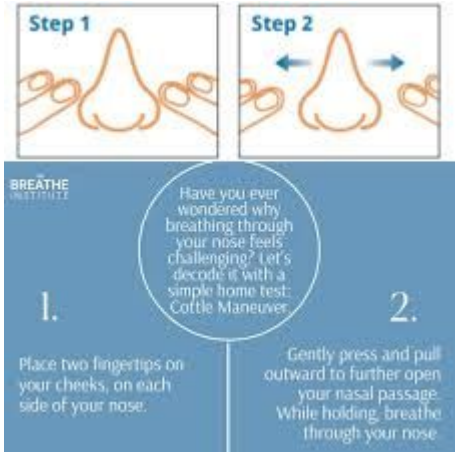


Nasal Valve Collapse

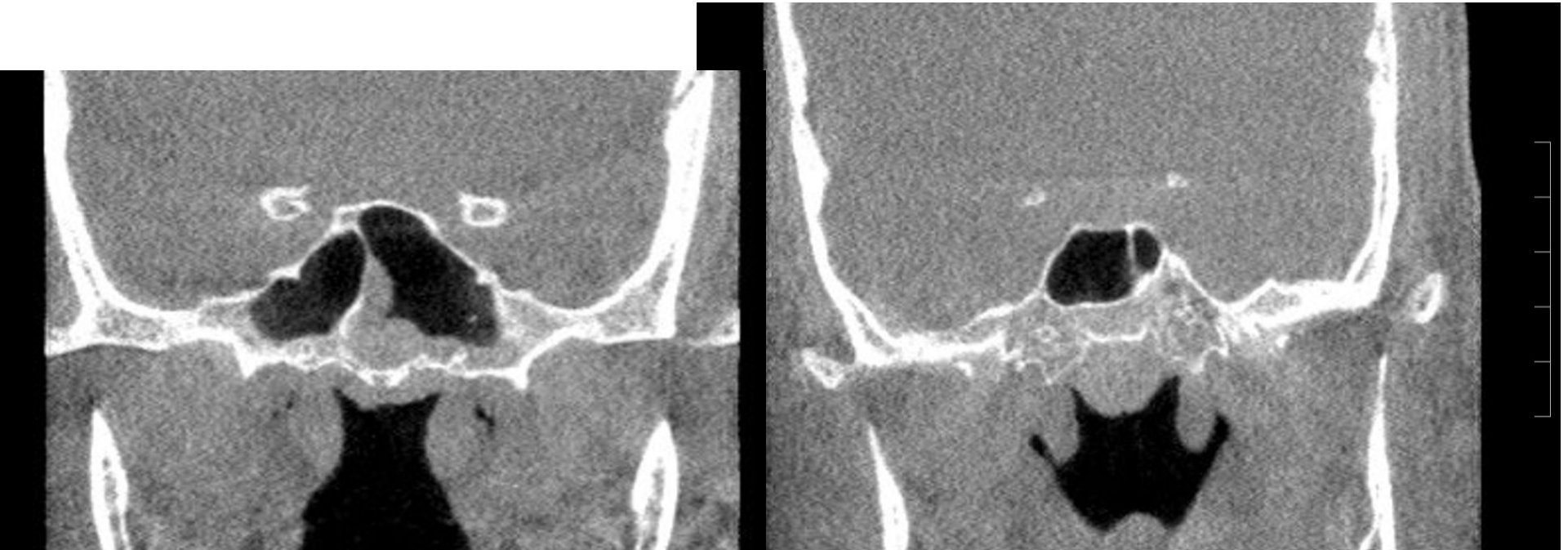
A CT scan is not the primary or most accurate way to diagnose nasal valve collapse, which is a functional problem involving the narrowing of the nasal airway.

Instead, a clinical examination using the Cottle maneuver, endoscopy, and observation of airflow is preferred.

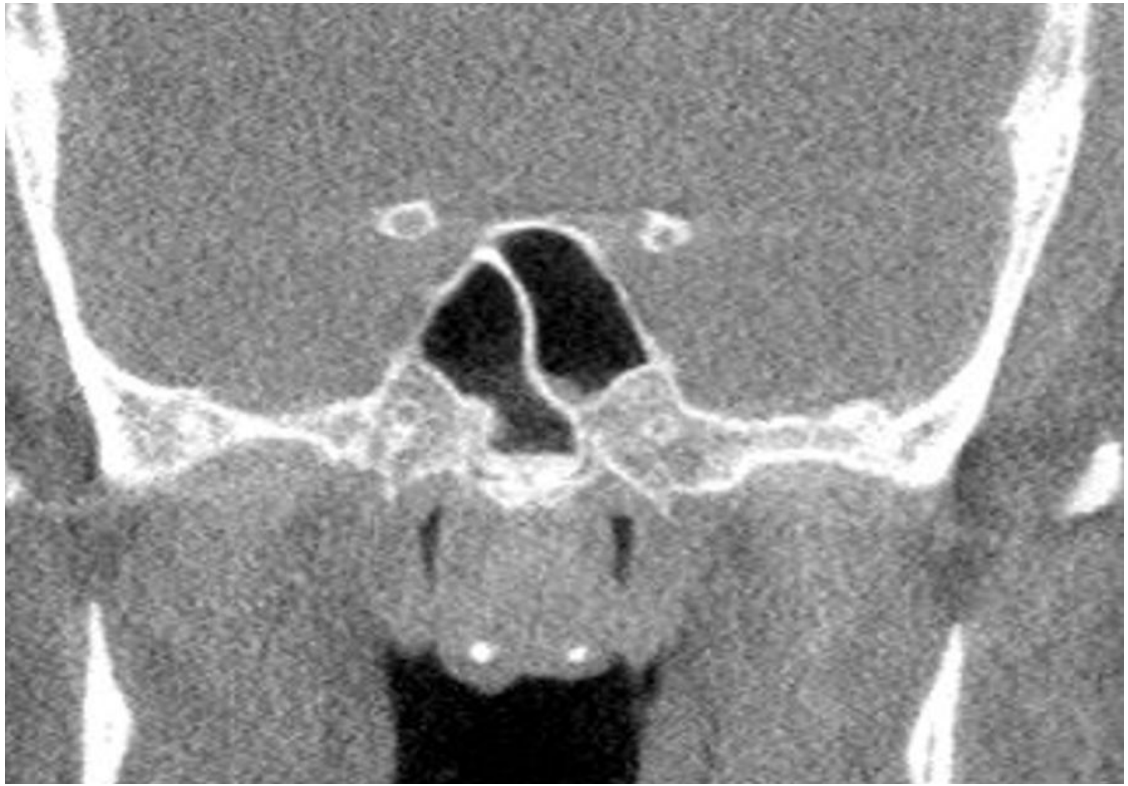




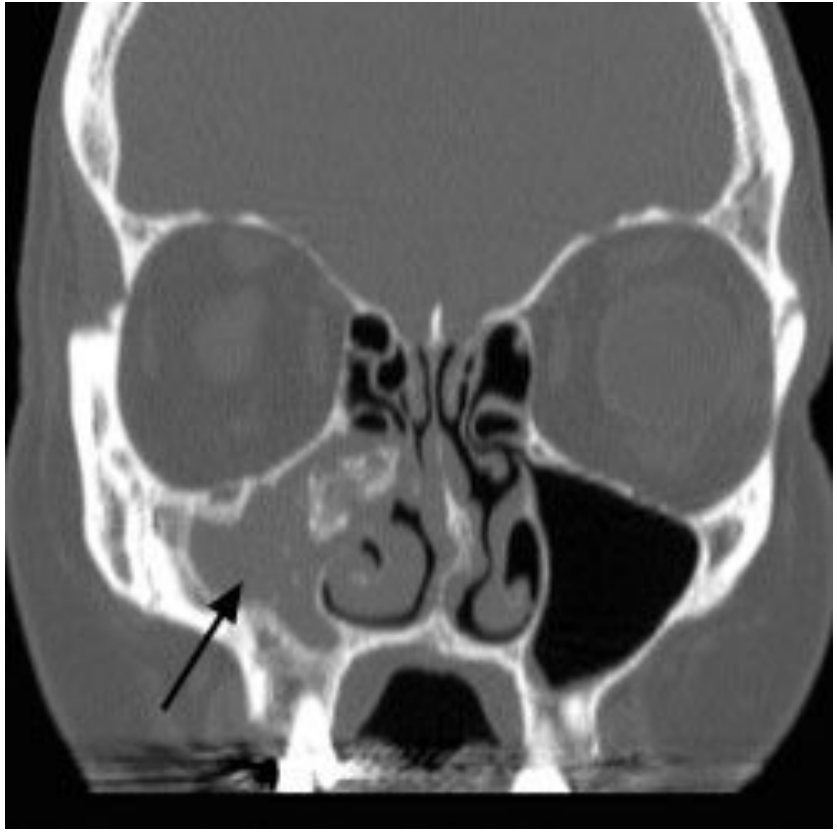
Normal Adenoids/Enlarged Adenoids



Tonsil Stones on Sinus CT Scan



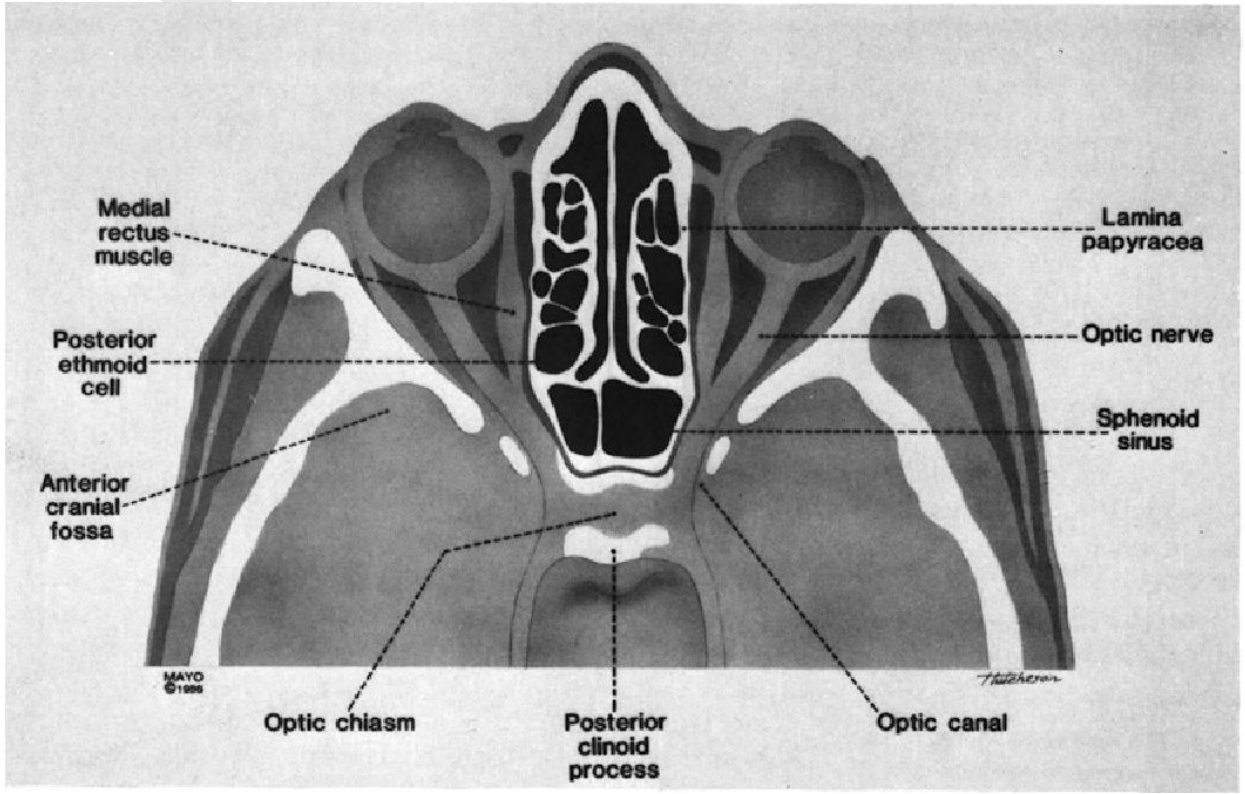
Fungal Ball

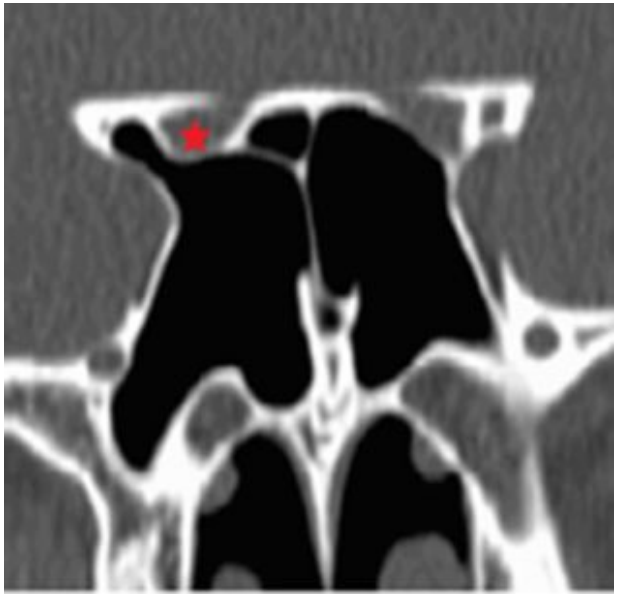


Important Anatomic Variants

- Optic nerve canals
- Vidian nerve canals
- Carotid canals

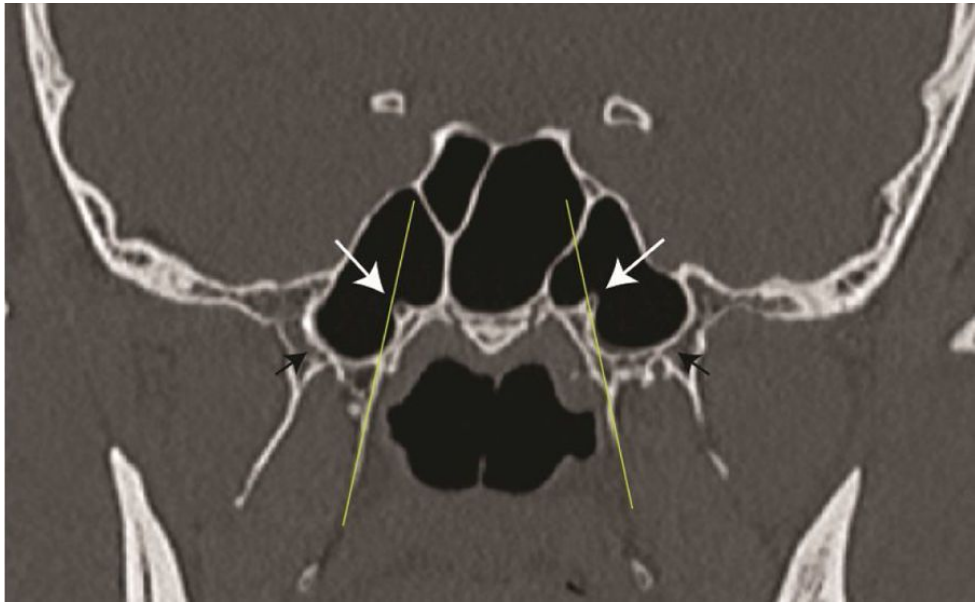
Optic Nerve Canals



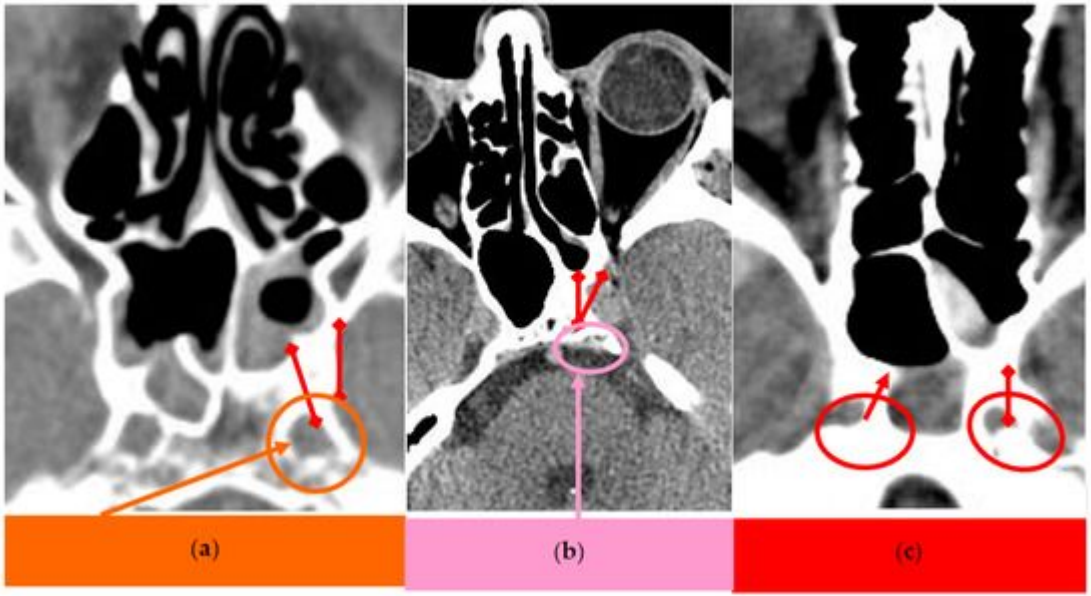


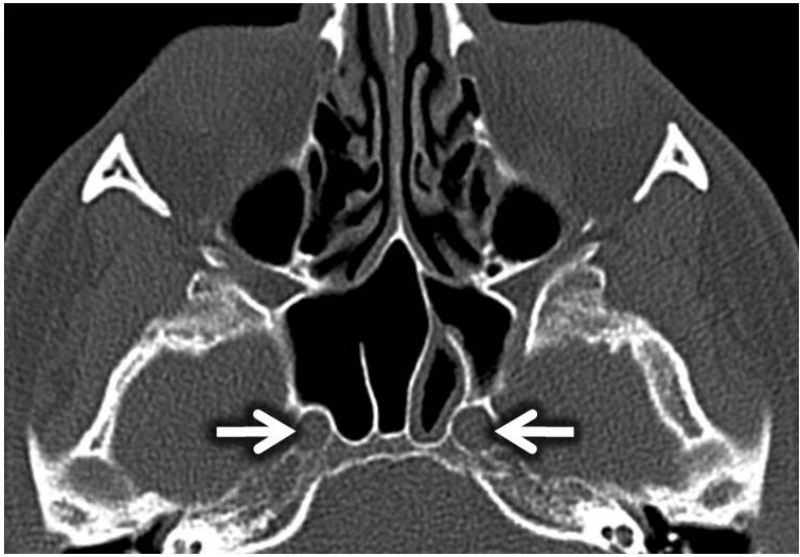
Vidian Nerve Canal

Controls secretions of the eye and nose



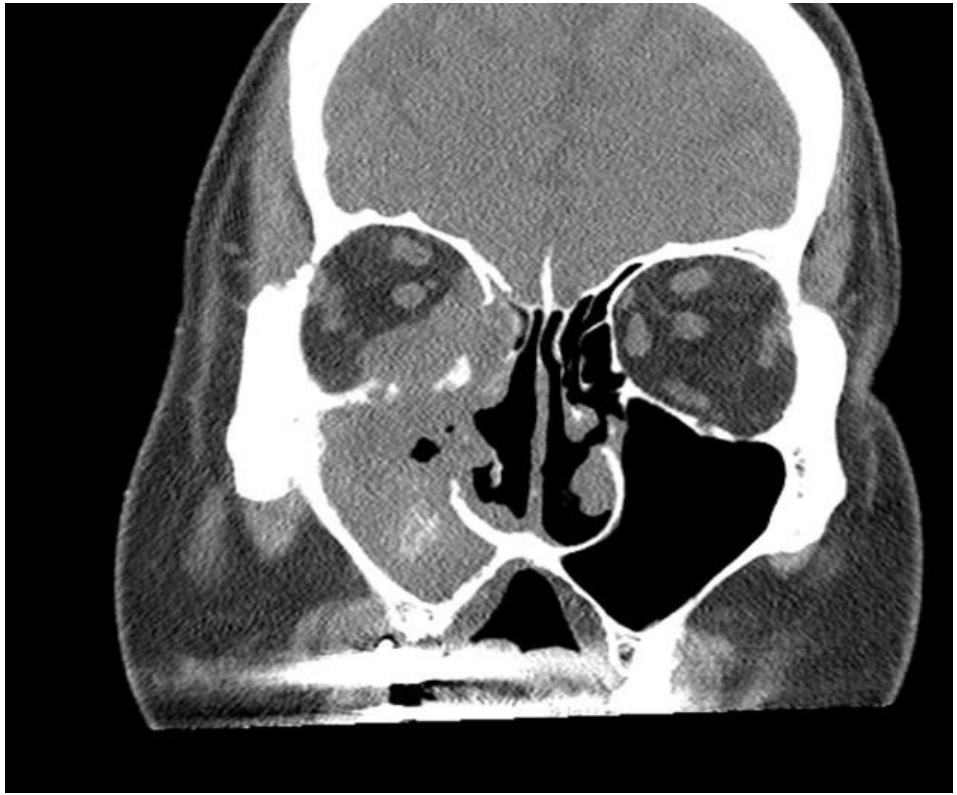
Carotid Canals





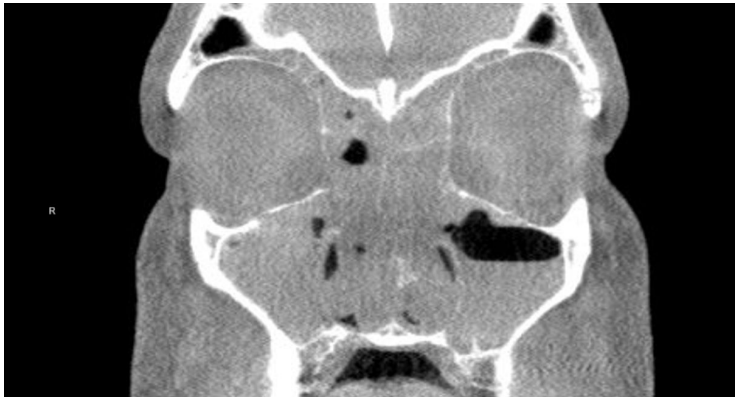
Worrisome Sinus CT Scans-Unilateral Nasal Polyps

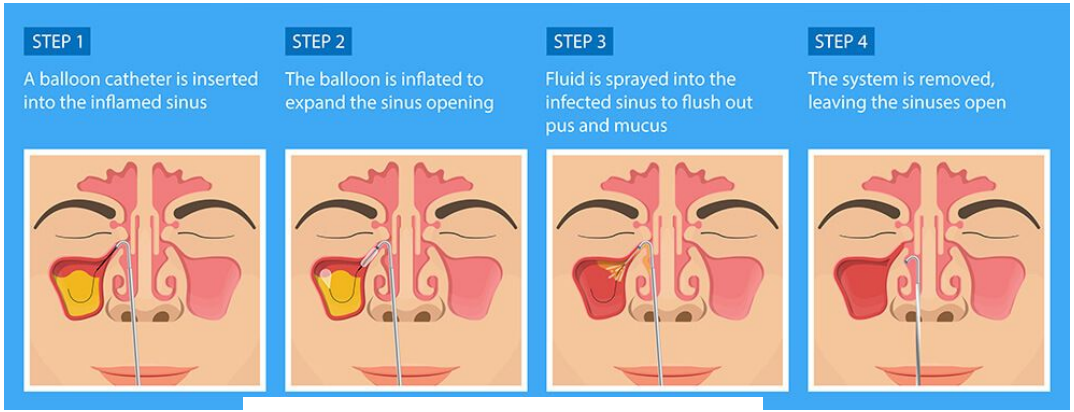
Worrisome Sinus CT Scans-Acute Invasive Fungal Sinusitis

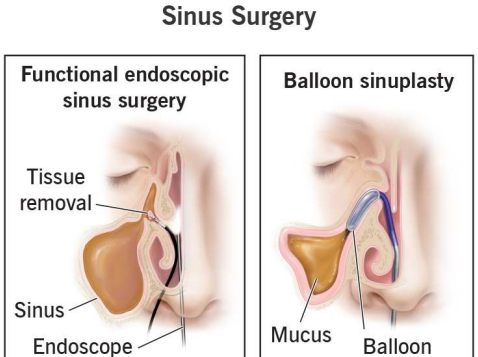


Worrisome Sinus CT Scans-Chronic Invasive Fungal Sinusitis

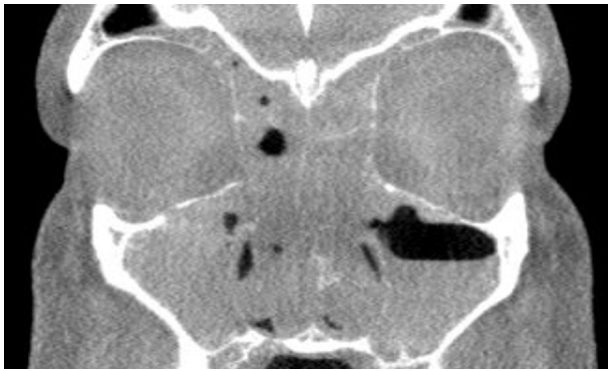
In Office Procedure-Balloon Sinuplasty or FESS, Polypectomy

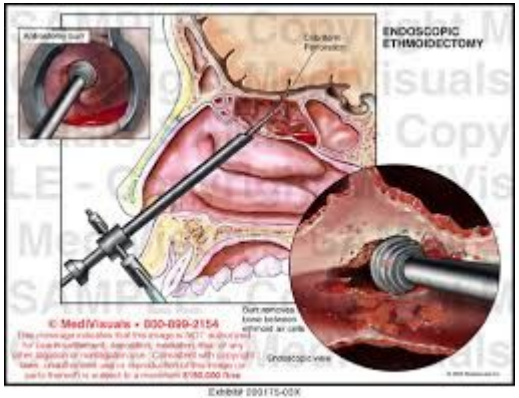




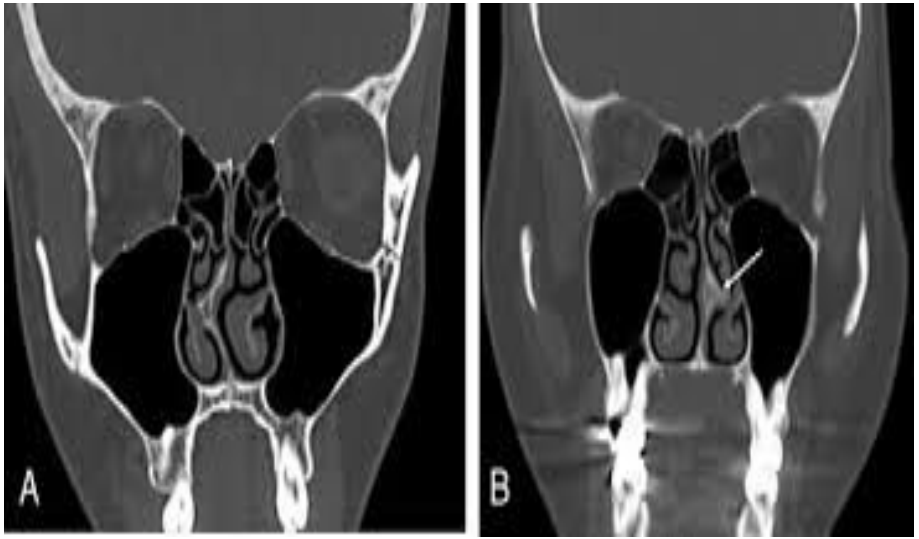


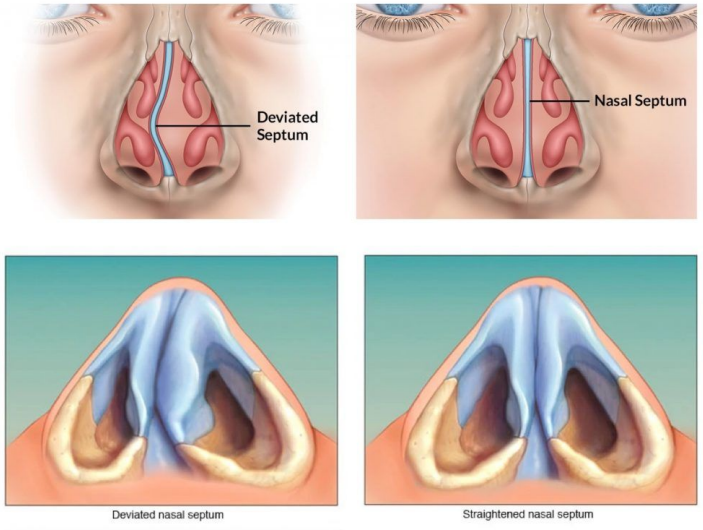
In Office Procedure-Partial Ethmoidectomy





In Office Procedure-Balloon Septoplasty or Functional Septoplasty

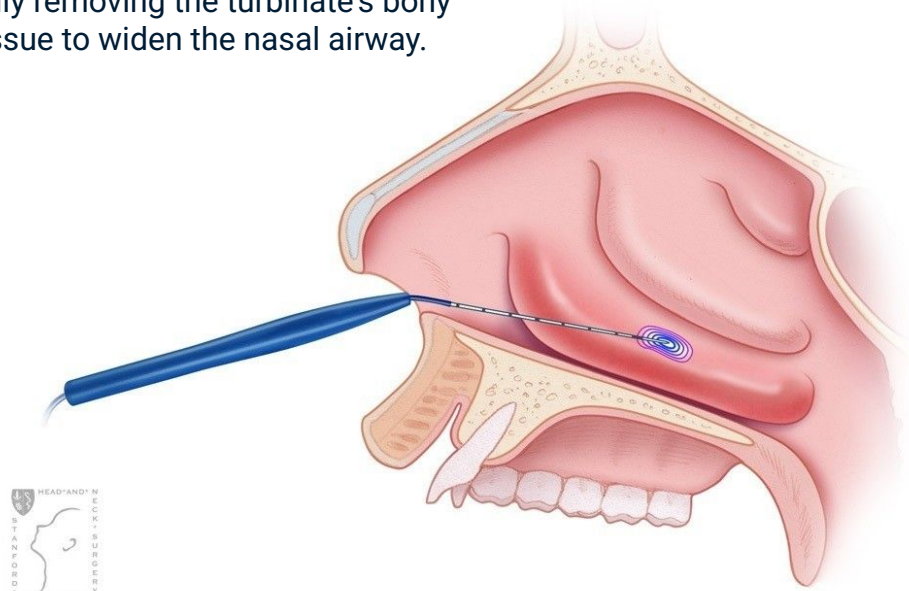




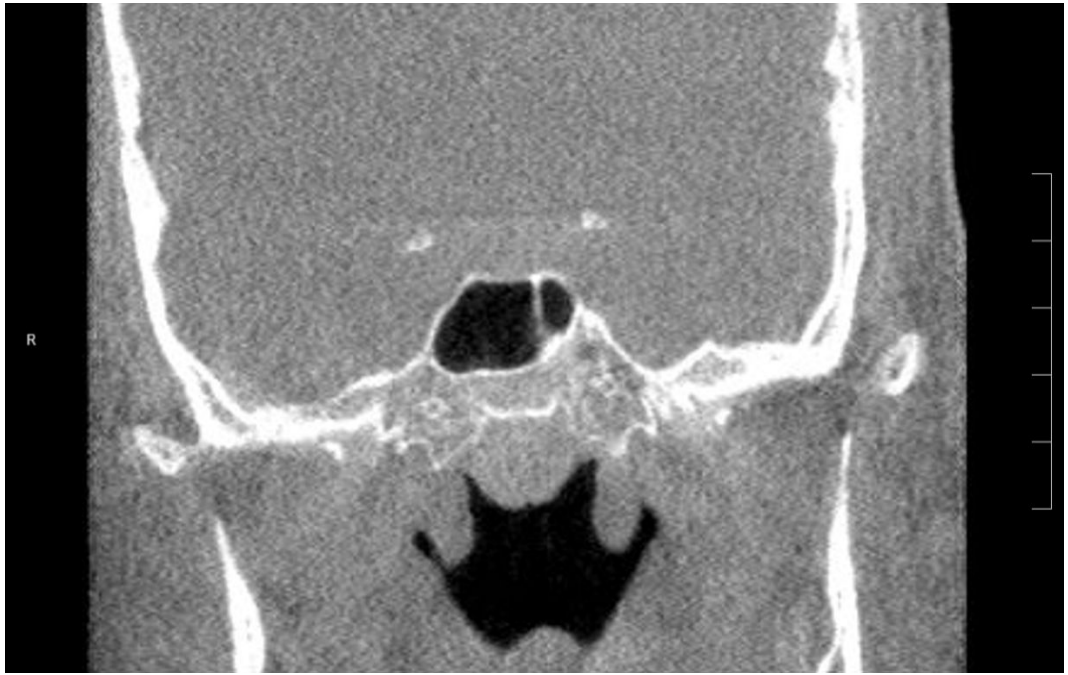
In Office Procedure-Turbinate Reduction and Concha Bullosa Excision

Turbinate Reduction: A thin, needle-like probe is inserted into the turbinate. Radiofrequency energy is emitted from the probe, which heats and shrinks the tissue.

Concha Bullosa Excision: The procedure involves techniques such as crushing the air pocket, partially or fully removing the turbinate's bony structure, or reducing the turbinate tissue to widen the nasal airway.

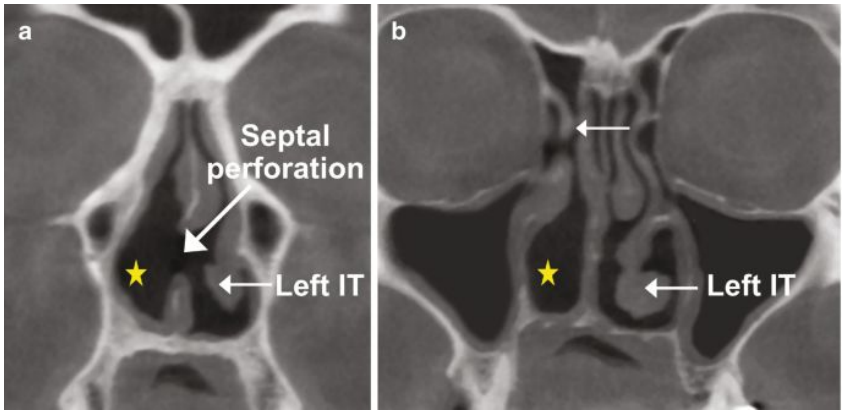


In Office Procedure-Adenoidectomy



Laser surgery is one method for performing this procedure, using a laser to vaporize and remove the adenoid tissue through the nose or mouth, often resulting in less bleeding than other methods

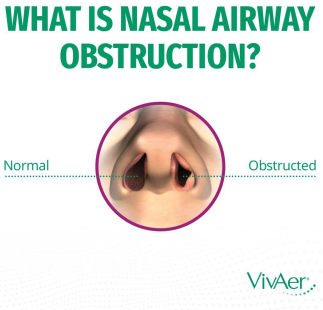
In Office Procedure-Septal Perforation Repair

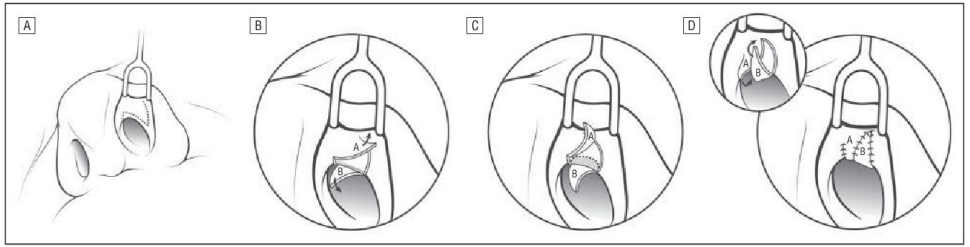


- Incision: An incision is made in the nasal lining to expose the perforation.
- Grafting: A graft material, such as cartilage or fascia, is used to cover the hole.
- Suturing: The graft is secured in place with sutures.

In Office Procedure-Vivaer, Z-plasty Valvuloplasty, Batten Graft Nasal Valve Repair

- Vivaer: non-surgical procedure that uses low-temperature radiofrequency (RF) energy to remodel the nasal passages, treating nasal airway obstruction (NAO) by improving airflow and relieving chronic congestion. The office-based procedure involves a small wand to gently reshape tissues, with minimal discomfort, allowing most patients to resume normal activities the same day.
- Z-plasty Valvuloplasty: a nasal valve repair technique for internal nasal valve collapse, where a Z-shaped incision is used to create flaps of tissue that are transposed to lengthen and widen the constricted nasal valve area, improving airflow. This minimally invasive procedure involves raising flaps, removing a part of the upper lateral cartilage, and then rearranging the flaps to provide a stable opening.
- Batten Graft: The procedure involves harvesting a thin piece of cartilage from either the septum (the cartilage dividing the two nostrils) or the ear. The harvested cartilage is then shaped into a batten graft and placed over the weakened alar cartilage. The graft is secured in place with sutures.





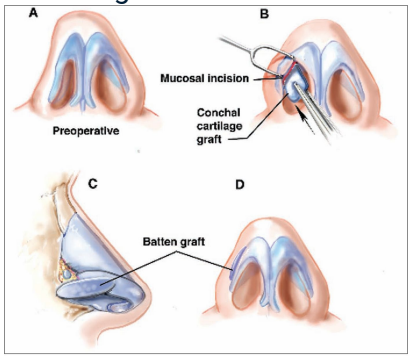


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Figure 3 coronal CT scan of nasal cavity at the nasal valve. (1) area... (n.d.-c). https://www.researchgate.net/figure/Coronal-CT-scan-of-nasal-cavity-at-the-nasal-valve-1-Area-of-the-internal-nasal-valve_fig3_752493838

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