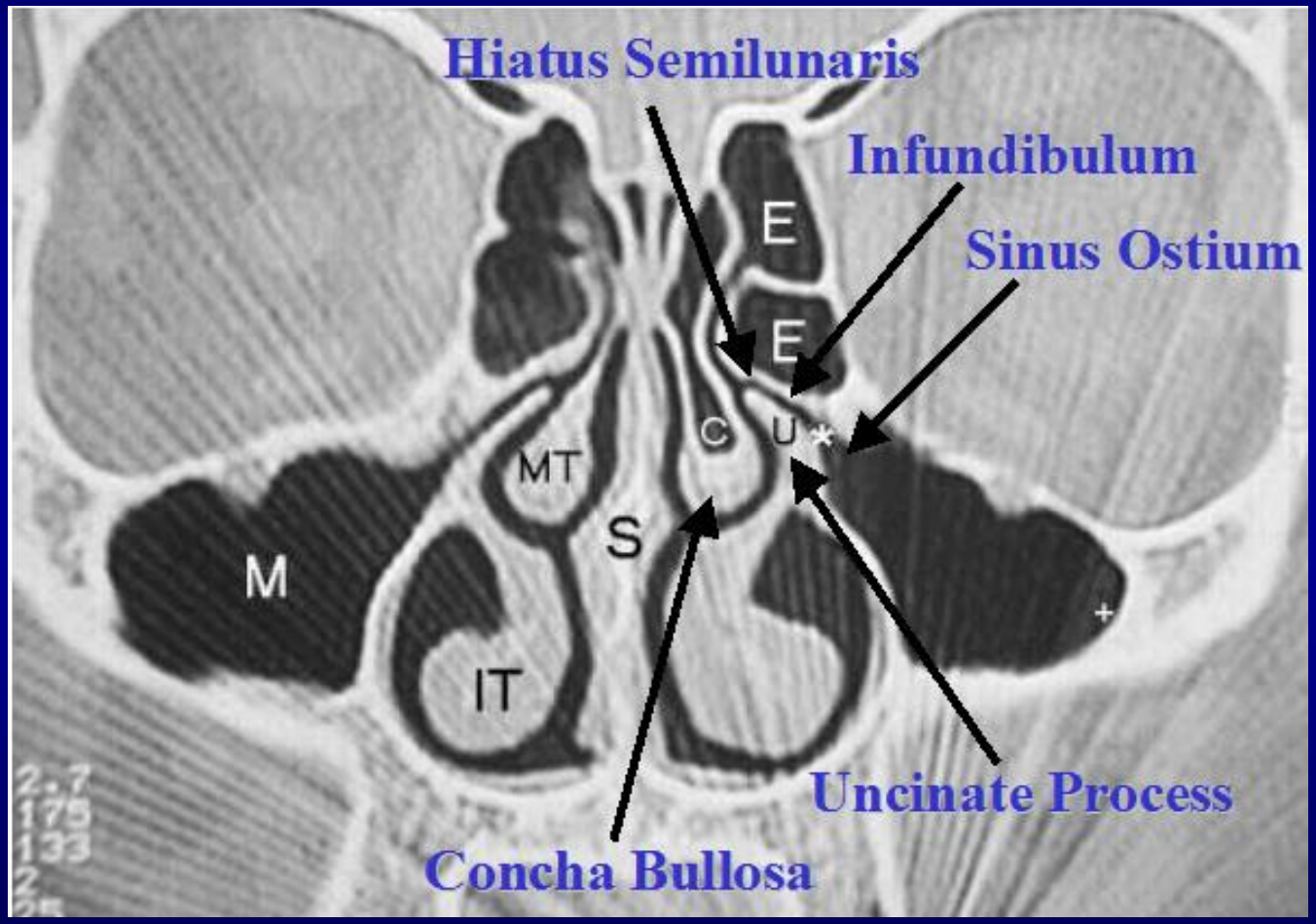
Anatomy

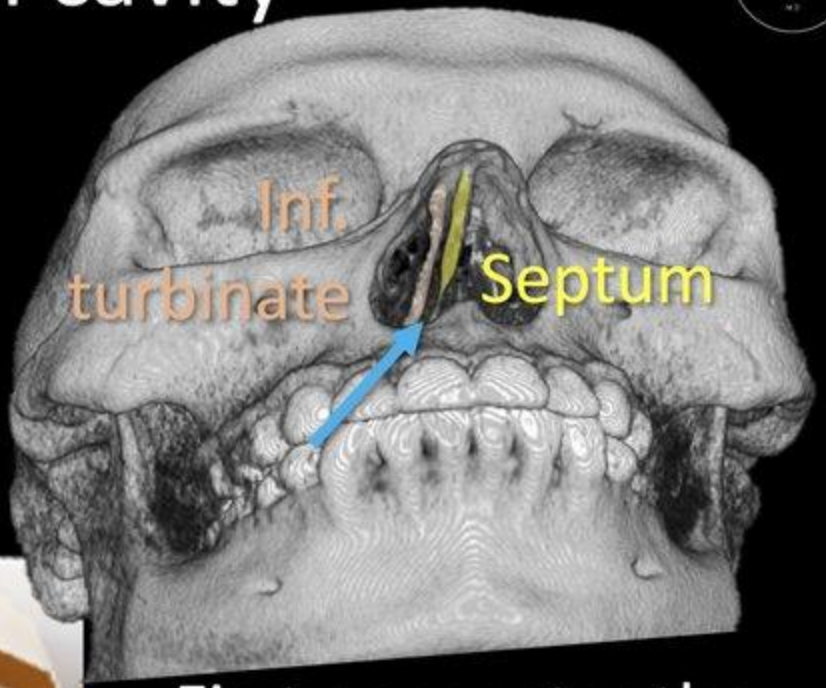

Hiatus Semilunaris
Infundibulum
Sinus Ostium
E
E
C
U
MT
S
M
IT
Uncinate Process
Concha Bullosa

Functional Endoscopic Sinus Surgery (FESS)

- 1/Time to FESS up!
- Do you understand functional endoscopic sinus surgery (FESS)?
- If you read sinus CTs, you better know what the surgeon is doing or you won't know what you're doing! Here's a thread to make sure you always make the important findings!
- 2/The first step is to insert the endoscope into the nasal cavity. The first two structures encountered are the nasal septum and the inferior turbinate.

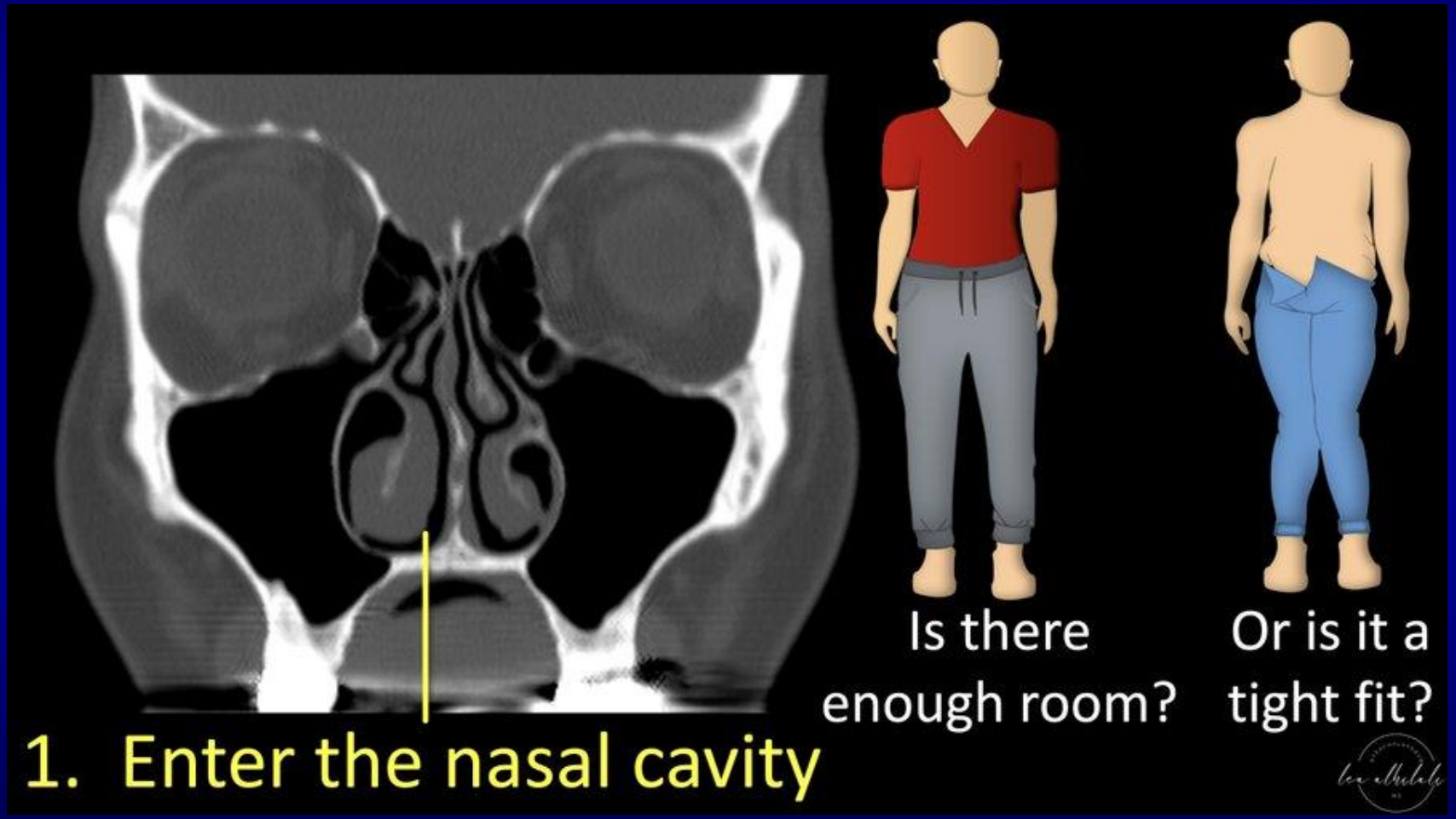
Step 1. Enter the nasal cavity

Endoscope is inserted into the nasal cavity



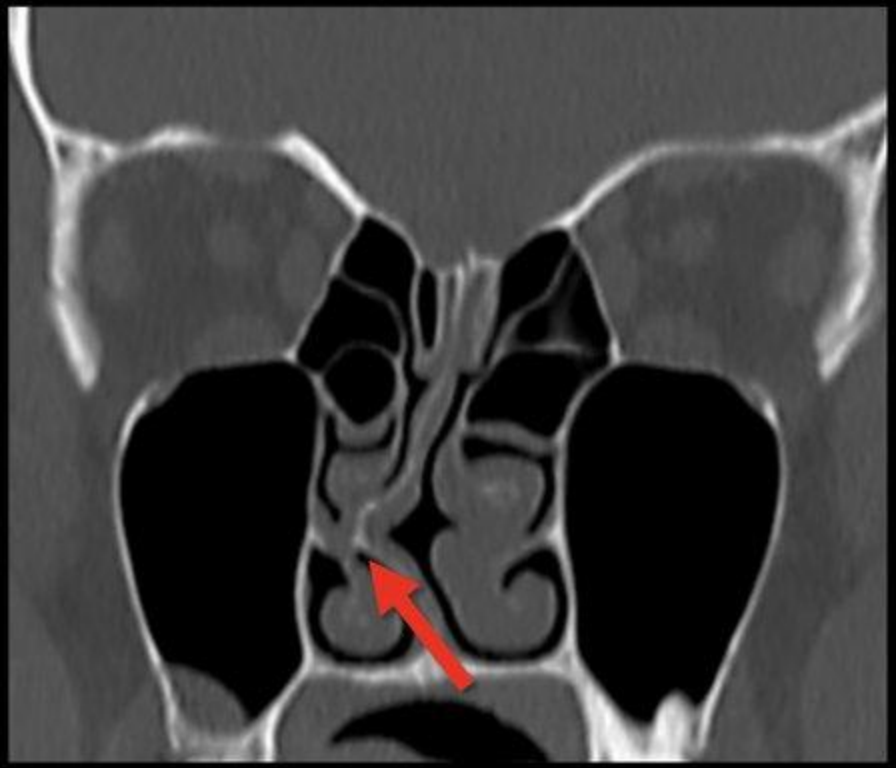
First encounter the septum & inferior turbinate

- 3/So on every sinus CT you read, the first question is whether there is enough room to insert the scope.
- Will it go in smoothly or will it be a tight fit?


Is there enough room?
Or is it a tight fit?
1. Enter the nasal cavity

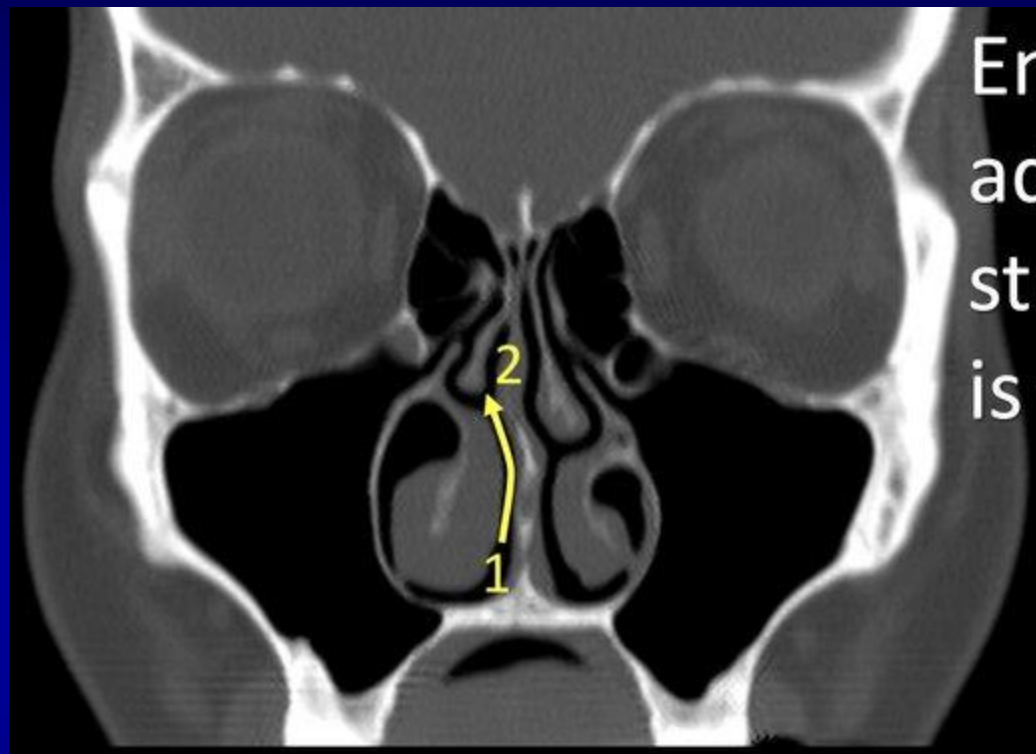
- 4/Prominent nasal septal deviation or enlarged turbinates can make it difficult. It is important to alert the surgeon to these.
- Occasionally, these may require a septoplasty or turbinate reduction in addition to the FESS, & you want the surgeon to be aware ahead of time

Tight fits

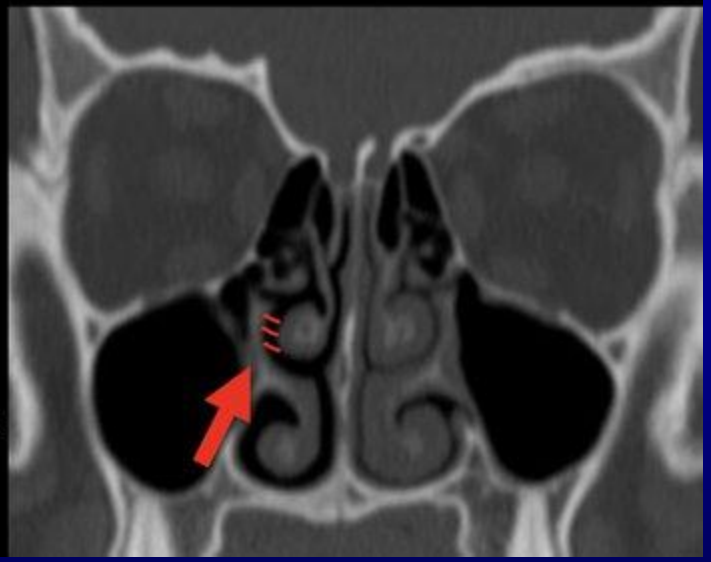


- Nasal septal deviation
- Enlarged Inferior Turbinate
- May require septoplasty or turbinate reduction

- 5/Next step is advancing the endoscope to the middle turbinate. It is an important landmark in FESS.
- Previously, FESS would often fail b/c of adhesions occurring after surgery between the mid turbinate & lateral nasal cavity wall—causing a new obstruction.

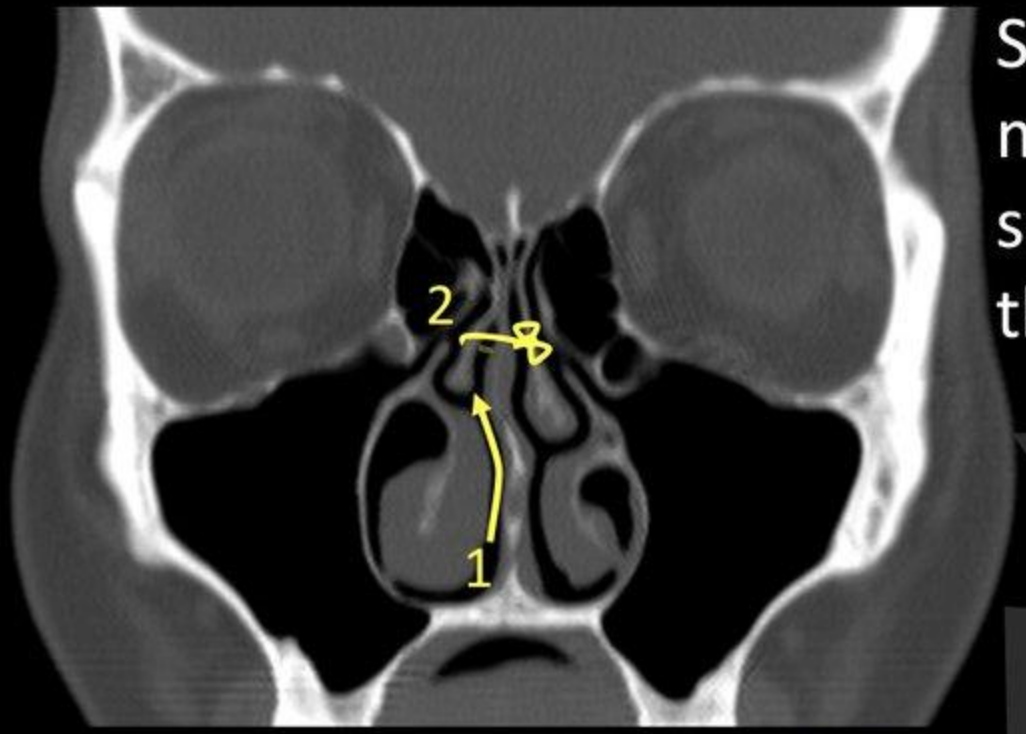


Endoscope is advanced & the next structure encountered is the middle turbinate

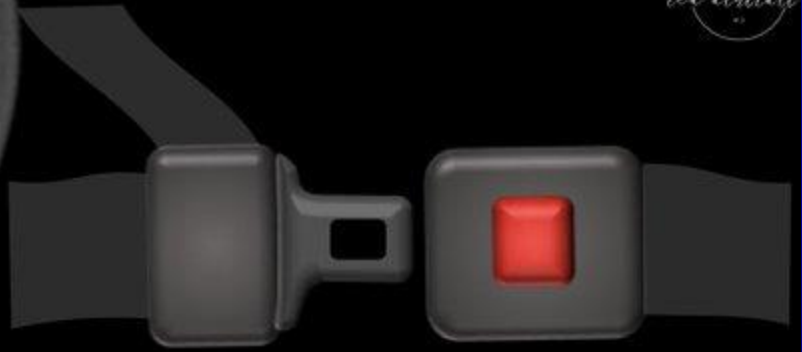


FESS failure used to be common from adhesions between middle turbinate & lateral nasal cavity wall

- 6/So now, to prevent this, the middle turbinate is medialized.
- A suture used to tie the turbinate to the nasal septum—keeping it medial, like a seat belt holding you in place.
- Eventually, scar will make the positioning permanent.



Suture is tied to pull the middle turbinate to the septum. Scar will solidify the position

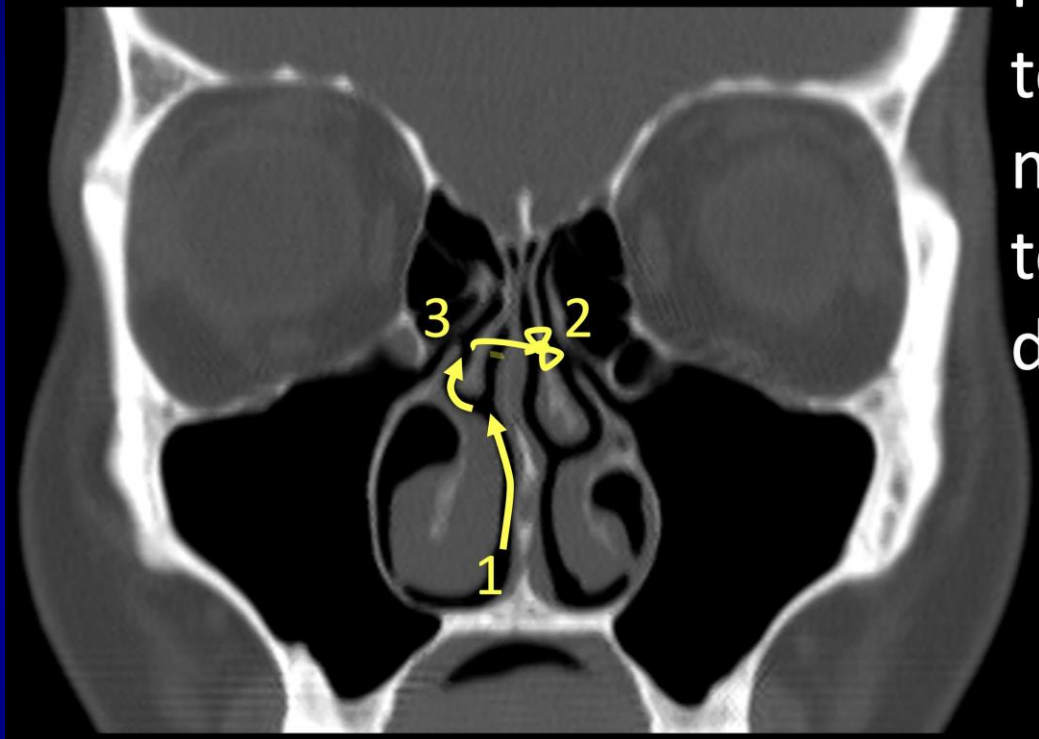


2. Medialization of the middle turbinate

Like seat-belting it in, to keep it in place

- 7/Next step is an uncinectomy. This step is used to open up the drainage pathway of the maxillary sinus—like popping the cork off champagne to open it up.

- To understand how this works, you have to understand how the maxillary sinus drains

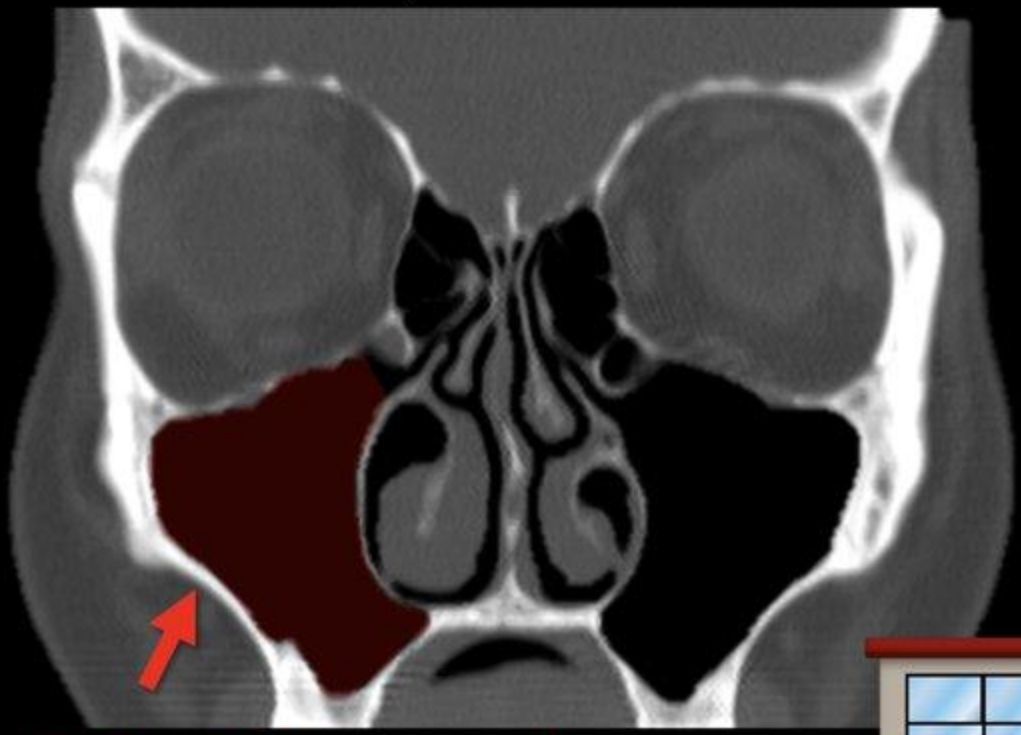


Popping the top off of the maxillary sinus to help drainage

3. Uncinectomy

- 8/Maxillary sinus cavity is the antrum.
- Think of the movement of mucus like the movement of travelers.
- Antrum is like the airport—where all the people congregate, waiting to move out to their final destination. Mucus needs to leave the antrum

Anatomy of the uncinate region

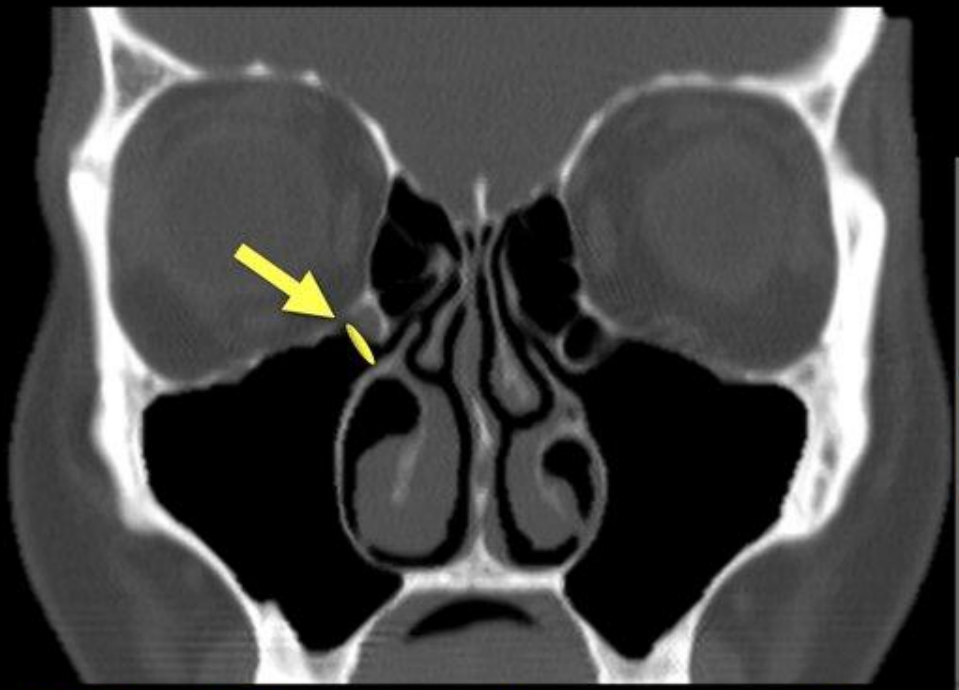


Like the airport— where everyone is looking to leave from

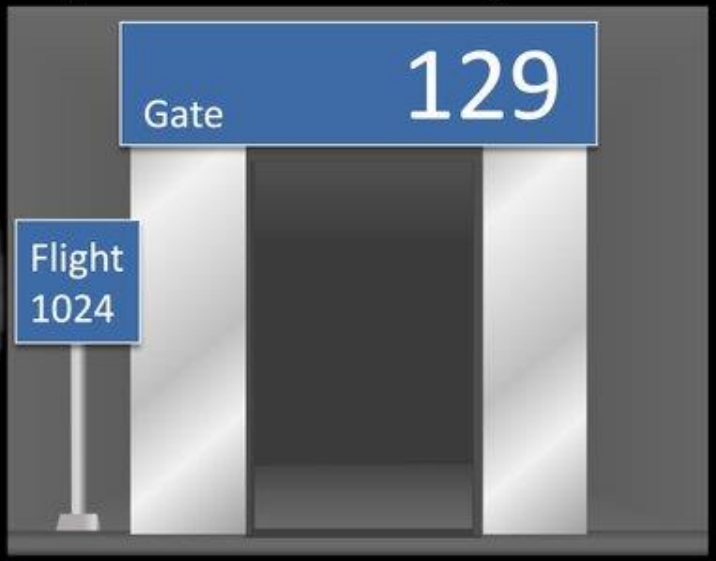
Maxillary sinus

- 9/The first door to exit the antrum is the ostium. Think of it like the airport gate to enter a plane. It lets you out of the airport—but you aren’t on the plane yet.

Anatomy of the uncinate region



Like the gate, where you exit the airport

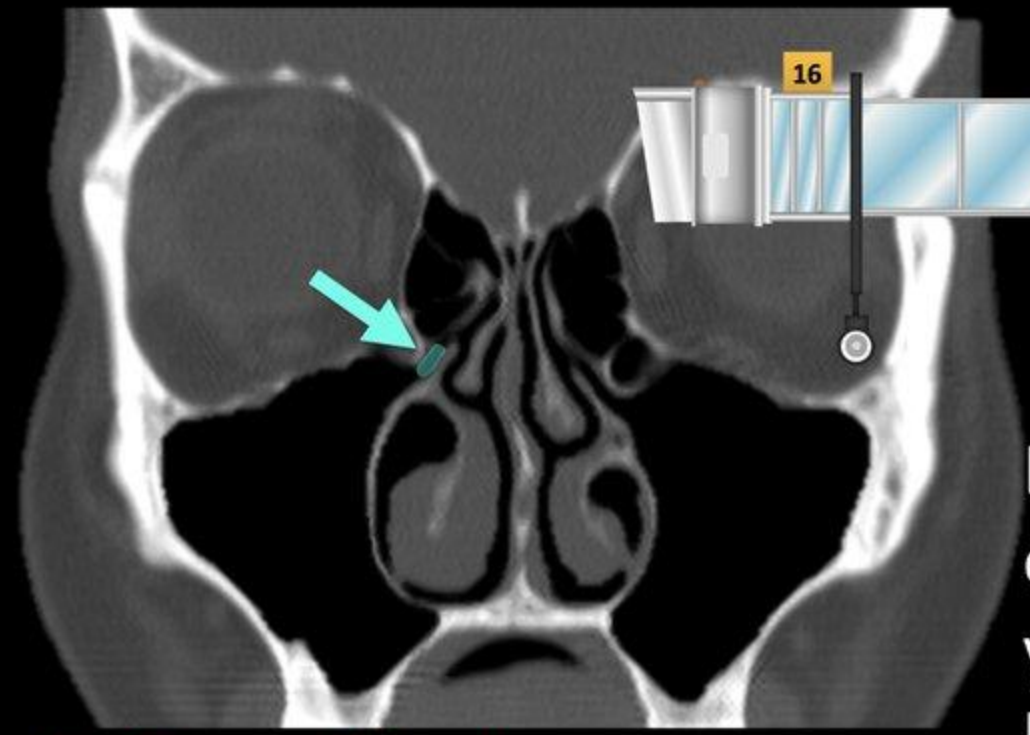


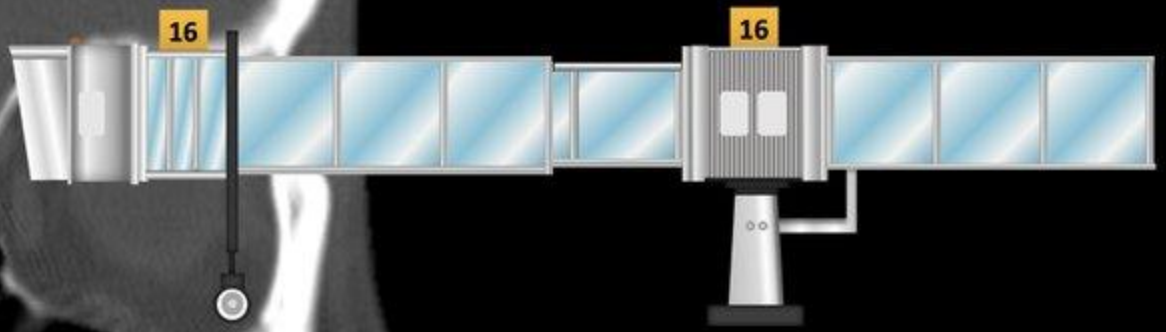
Maxillary sinus ostium

- 10/Just like an airport gate leads you out of the airport into a long hallway—the jetway—the ostium opens to a hallway-like structure called the infundibulum

- Just how you must walk down a jetway to get to the plane, you must go through the infundibulum before you can truly leave

Anatomy of the uncinate region





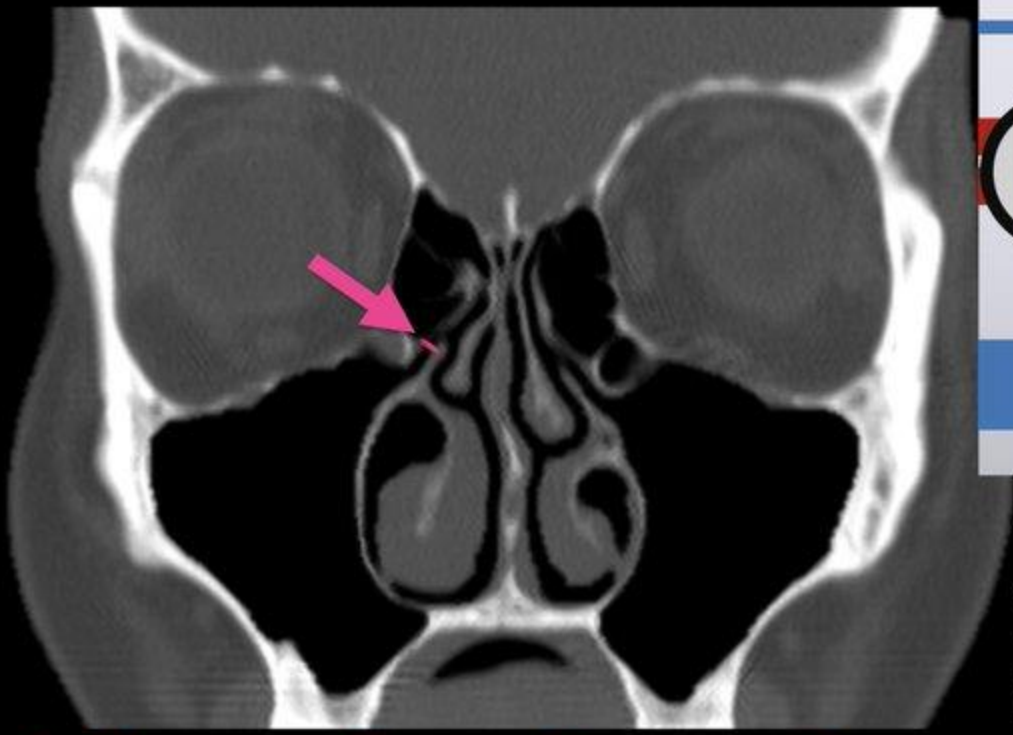
Like a jet way—you've exited the airport, but you have to traverse this bit to get to the plane

Infundibulum

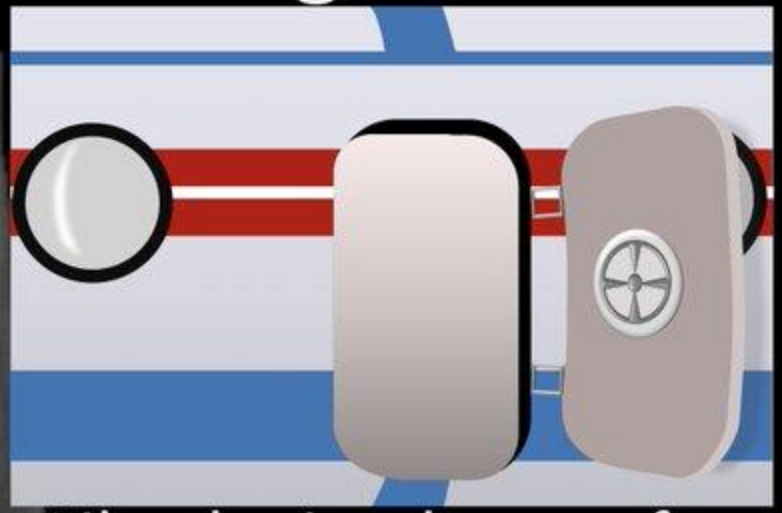
- 11/The end of the infundibulum is the hiatus semilunaris—just like how the jetway ends in the door of the plane.

- This is the exit that finally allows you to leave the maxillary sinus drainage pathway—just how entering the airplane finally allows you to take off.

Anatomy of the uncinate region



Hiatus Semilunaris

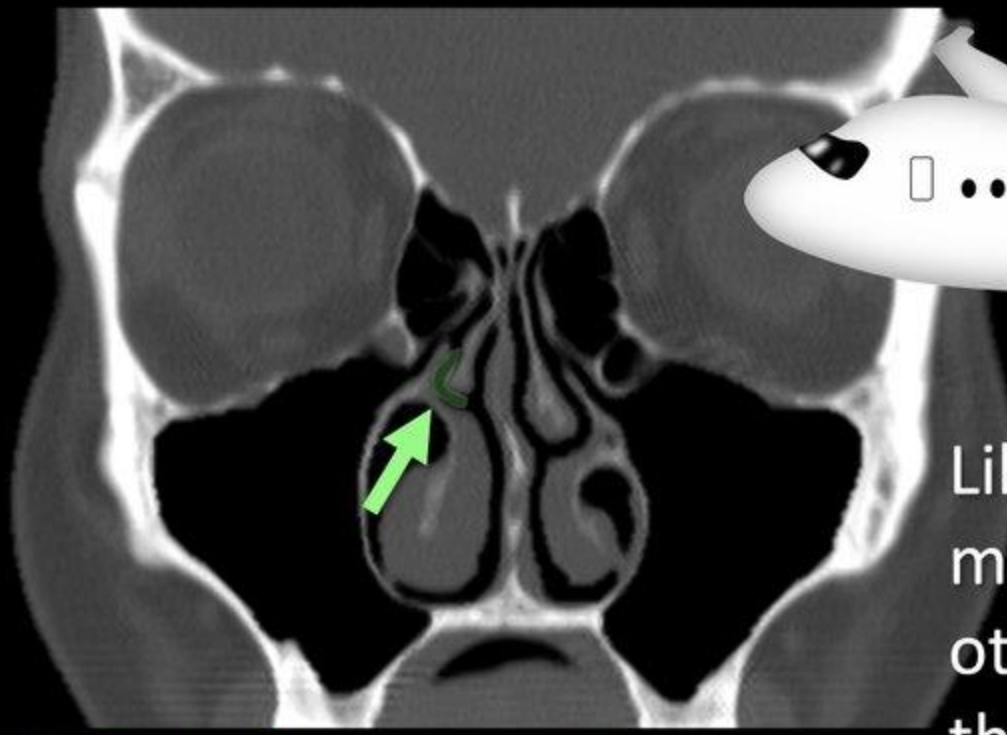


Like the jet door—after you go through it, you're finally free to take off & leave

- 12/The hiatus semilunaris opens to the middle meatus—a space in the nasal cavity that is a common meeting point for many drainage pathways

- Think of it like the jet plane. People from many different places come together on one plane & now can head off to their final destination

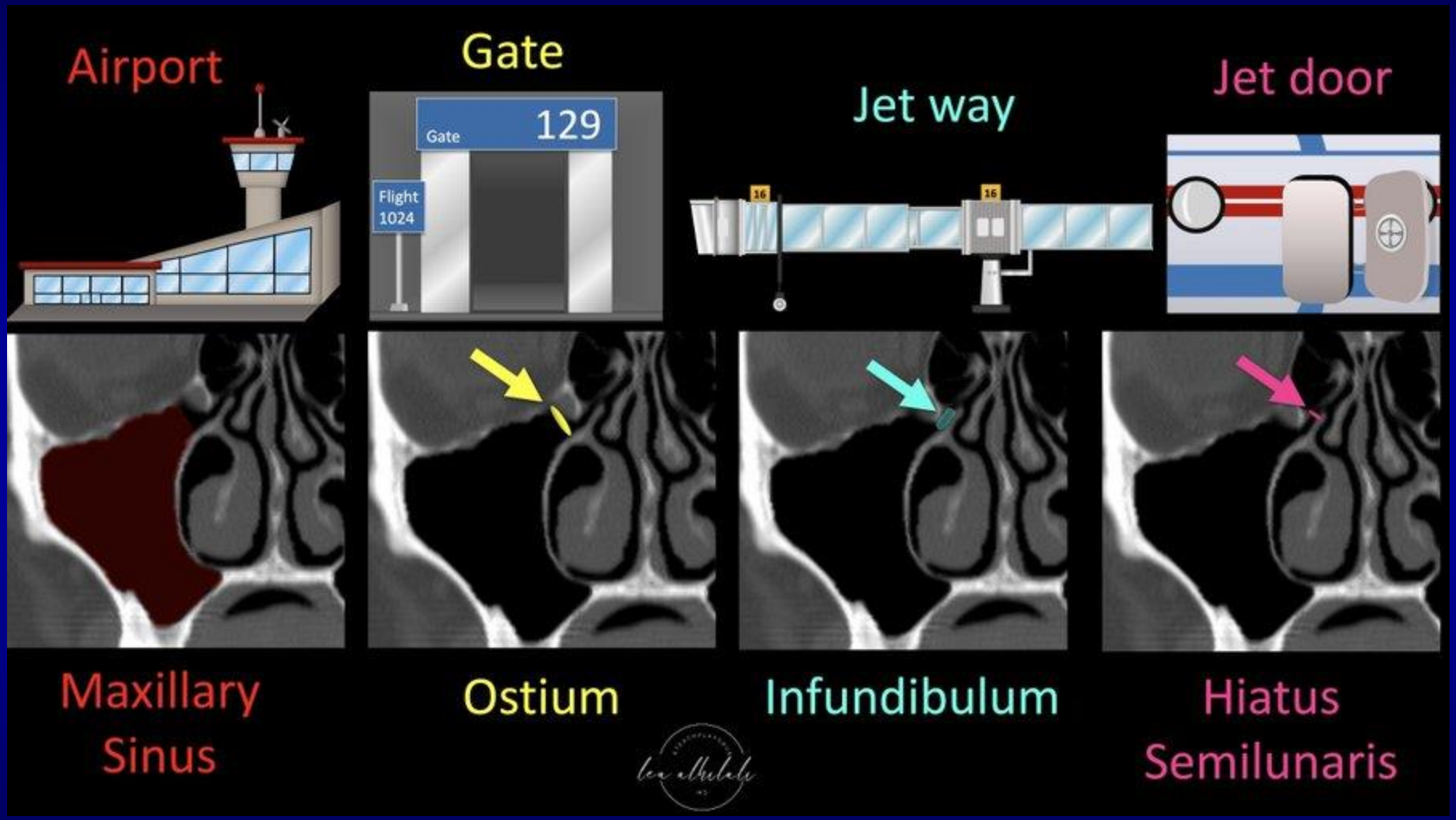
Anatomy of the uncinate region



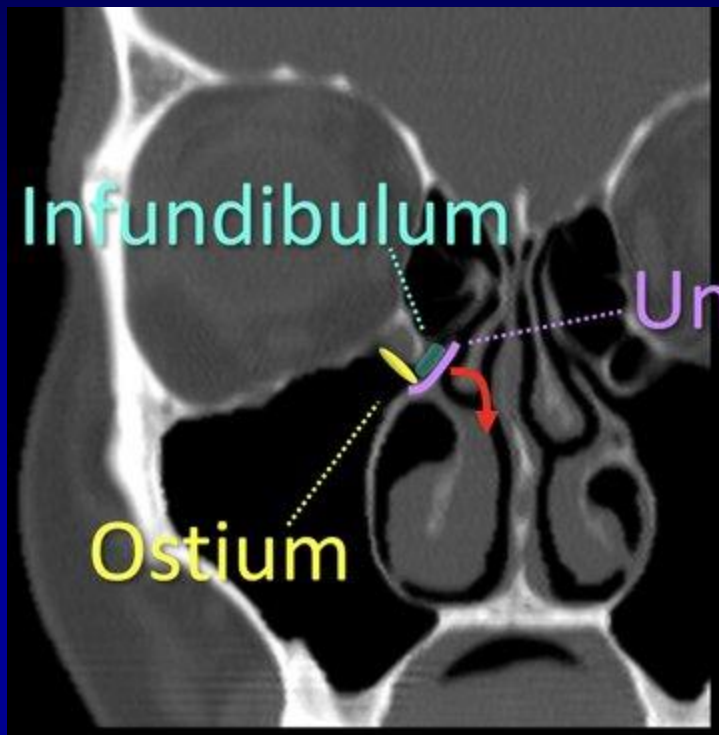
Like the plane—free to move around and join others from all around the sinuses

Middle meatus

- 13/Here is a summary of the maxillary sinus drainage—from the airport (antrum), you exit through the gate (ostium), before traversing down a jetway (infundibulum) to go through the jet door (hiatus semilunaris), that lets you join your fellow travelers on the jet (middle meatus)


Airport
Gate
Gate 129
Flight 1024
Jet way
16
16
Jet door
Maxillary Sinus
Ostium
Infundibulum
Hiatus Semilunaris

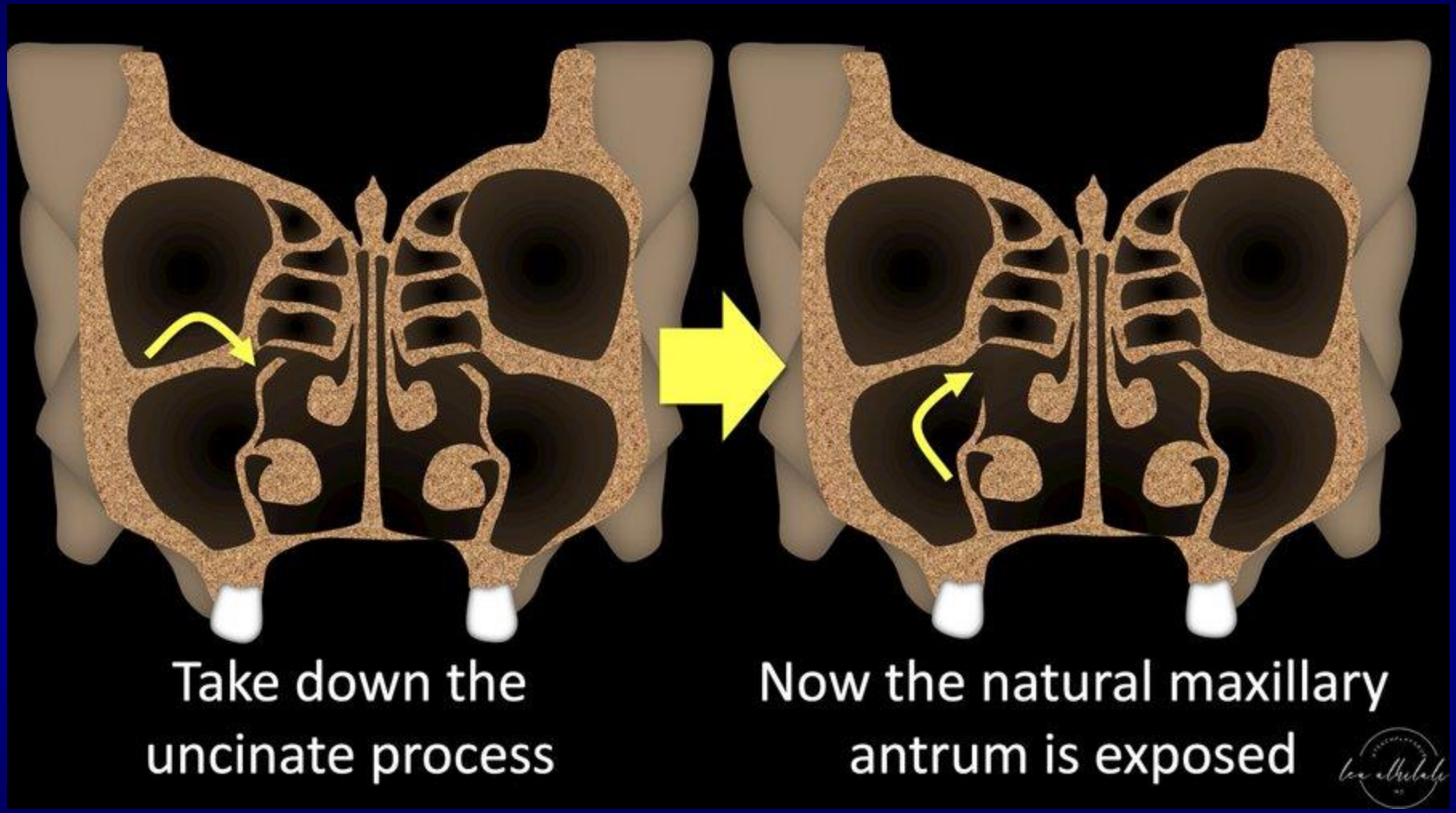
- 14/Uncinate process is the wall helping to create this drainage pathway
- It must be taken off to expose, or open up, the door of the natural maxillary ostium



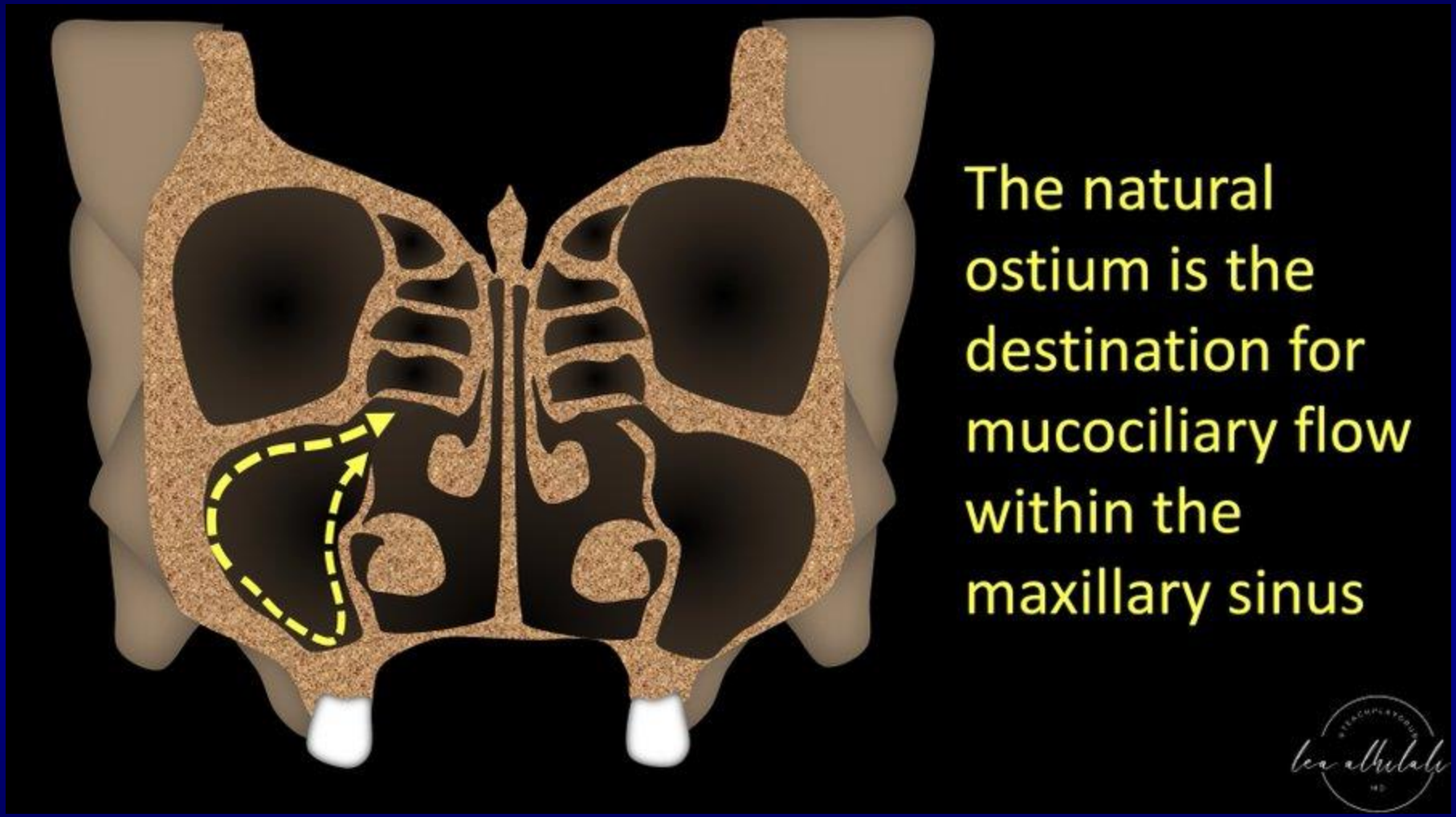
Must take down uncinate to expose the drainage pathway of the maxillary sinus (ostium, infundibulum)

- 15/Taking down the uncinate process exposes the natural maxillary ostium

- You must be careful to alert the surgeon to findings that would increase the risk of violating the orbit when they take down the uncinate, such as an atelectatic uncinate process against the orbit


Take down the uncinate process
Now the natural maxillary antrum is exposed

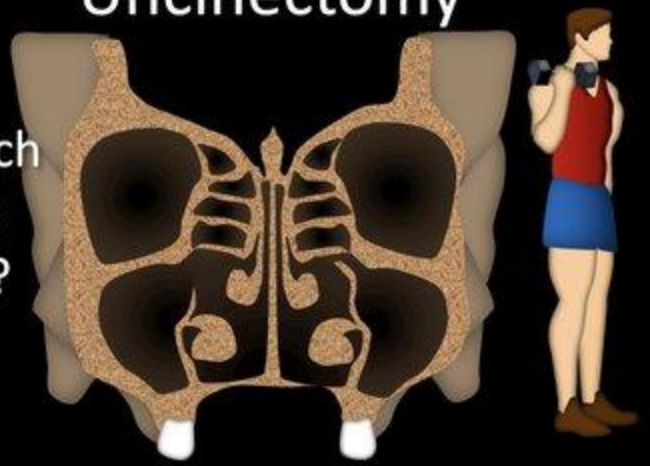
- 16/The ostium is the natural endpoint for the mucociliary flow in the maxillary sinus.
- Mucus will be propelled towards the ostium—so if the ostium is opened up, more mucus flow can get through.
- How much to open it up?


The natural ostium is the destination for mucociliary flow within the maxillary sinus

- 17/Minimum is a uncinectomy (just taking down the uncinate).
- This can further be enlarged front to back in a type 1 sinusotomy—or enlarged both front to back & up and down for a type 2 sinosotomy.
- Largest is a type 3 sinosotomy—usually for polyposis

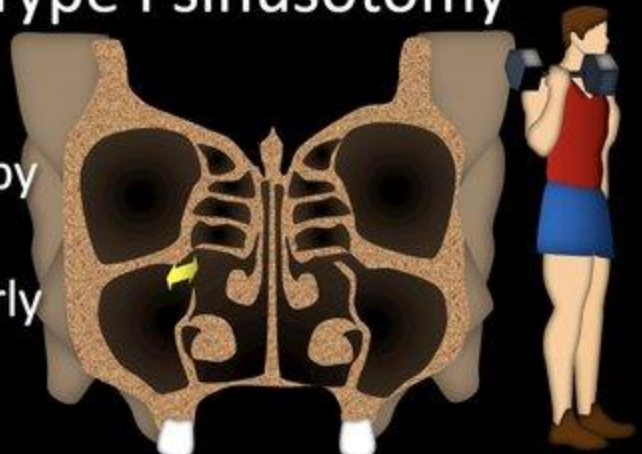
Uncinectomy

How much to take down??



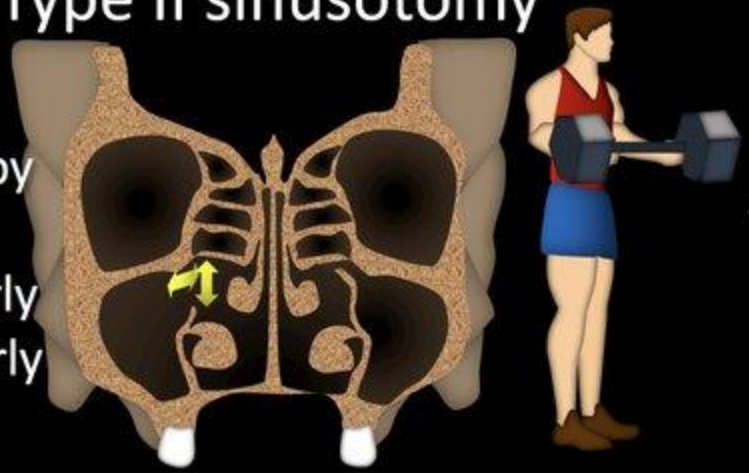
Type I sinusotomy

Enlarge by 1 cm posteriorly



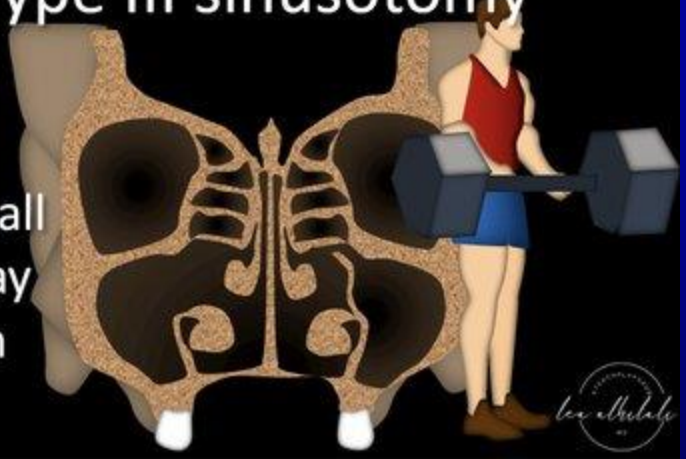
Type II sinusotomy

Enlarge by 2 cm posteriorly & inferiorly

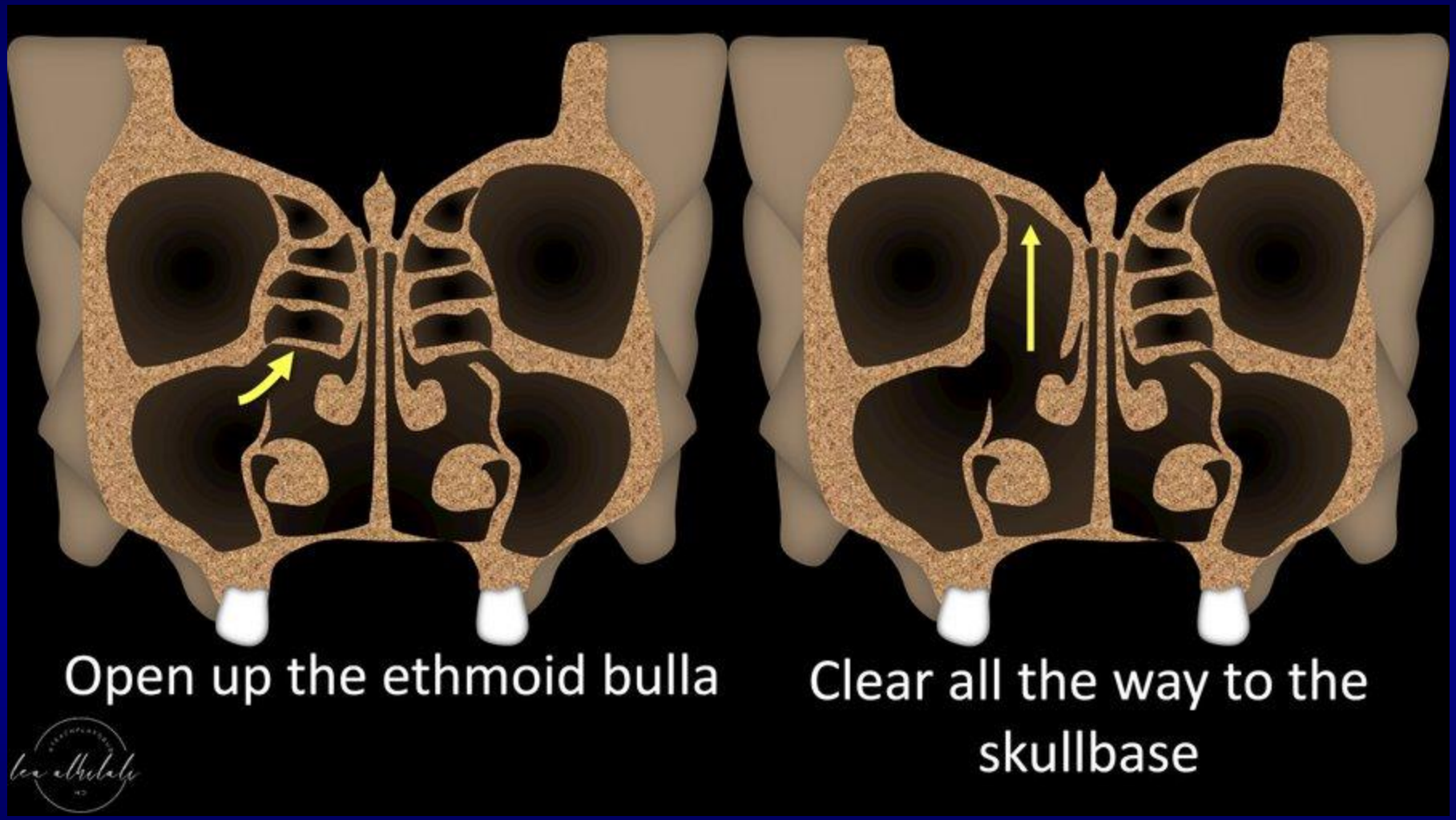


Type III sinusotomy

Take it all the way down

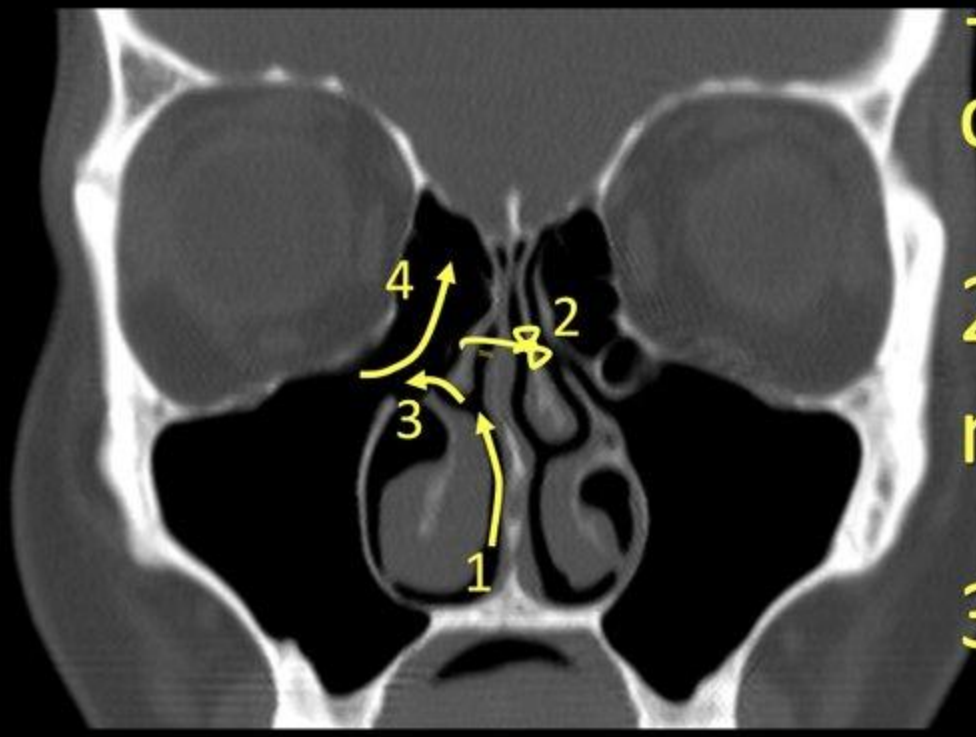


- 18/Next is an ethmoidectomy.
- Anterior ethmoid air cells have to be cleared all the way to the skull base.
- So mention any findings that could increase risk of perforation of the skull base, such as a deep cribiform plate.


Open up the ethmoid bulla
Clear all the way to the skullbase

- 19/If the disease is only involving the anterior drainage, these four steps make up the steps of FESS.

- Posterior disease requires more extensive surgery, but that’s for another tweetorial, I must conFESS!



1. Enter the nasal cavity
2. Medialization of middle turbinate
3. Uncinectomy
4. Ethmoidectomy