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How to print Handouts

On a Mac

- Open PDF in Preview
- Click File
- Click Print
- Click dropdown menu on the right "preview"
- Click layout
- Choose # of pages per sheet from dropdown menu
- Checkmark Black & White if wanted.

On a PC

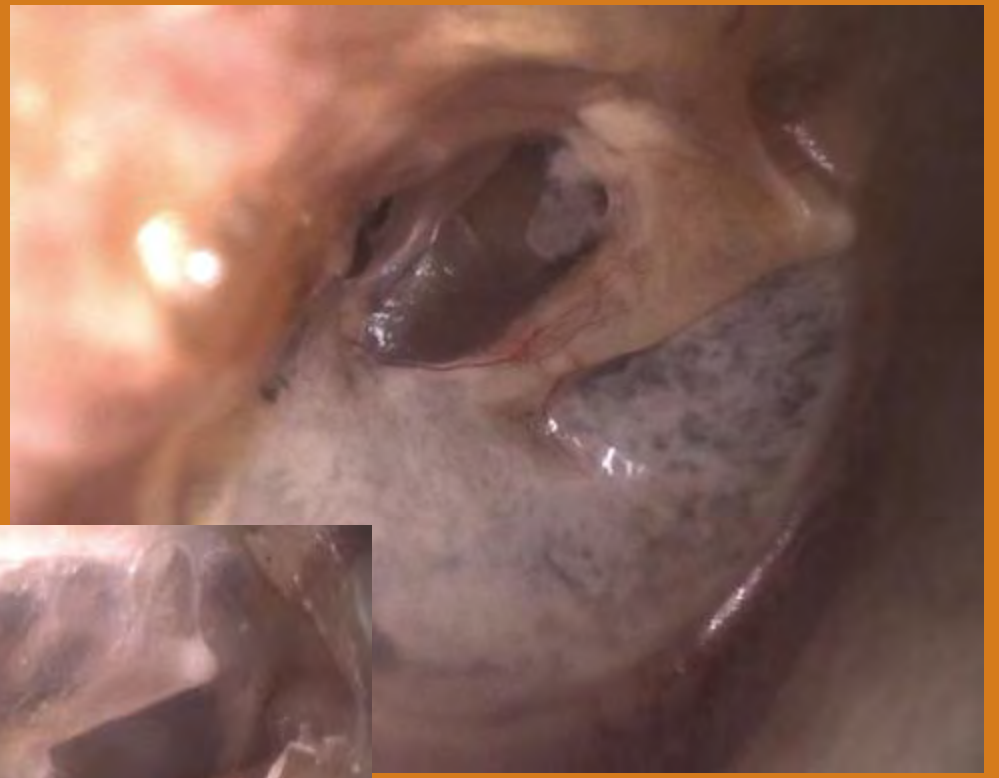
- Open PDF
- Click Print
- Choose # of pages per sheet from dropdown menu
- Choose Black and White from "Color" dropdown

Academia

CLAYTON FISHER

M.Cl.Sc., Audiologist

Practical Video Otoscopy: Everyday Clinical Imaging of the External/Middle Ear



Wednesday, December 4, 2024

12:00 PM EST

inventis
Audiology & Balance

About Me

I am a clinical audiologist, clinic owner, and father of three

I have a decade of clinical experience in assessment and treatment of hearing loss

I've worked in chain clinics, hospitals systems, and now I have my own private practice

- I love to optimize clinical workflow and efficiency
- I also like teaching
    - Check out my AO webinars and articles:

https://www.audiologyonline.com/audiology-ceus/search/term:Clayton%20Fisher/

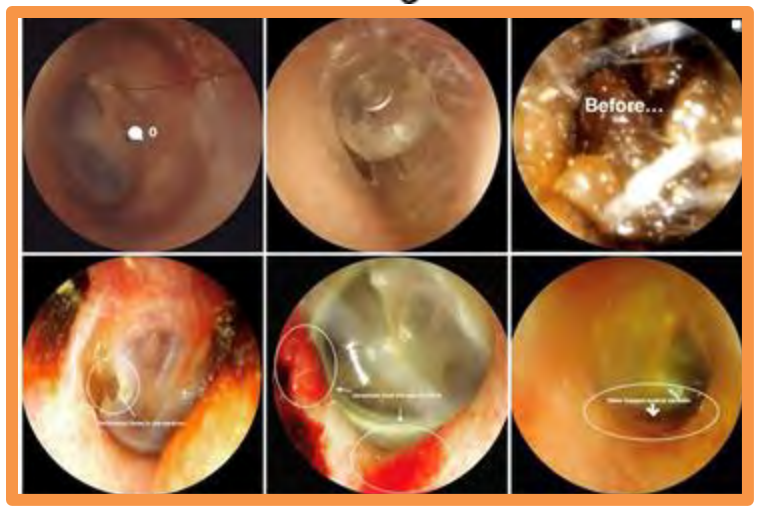
About Me

I do not have an AuD or a PhD (and I'm not an ENT)

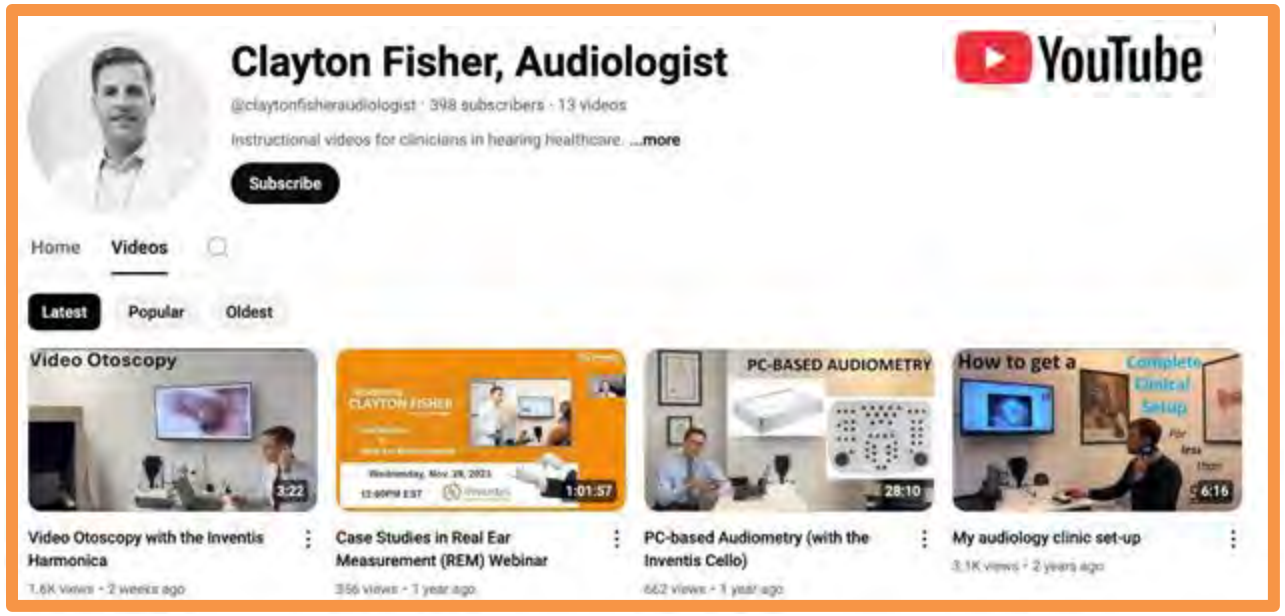
but I love clinical audiology and I'm always trying to improve my clinical practice and the patient experience

and share this with other clinicians!

Instagram



https://www.instagram.com/earwaxremovalottawa/



https://www.youtube.com/@claytonfisheraudiologist

Workshop Goals

Learning Objectives:

1) Learn about the developments in clinical video otoscope technology and the different types of devices available

2) Understand why video otoscopy (VO) is essential to a modern hearing clinic and some tips and tricks for its use

3) Learn by example: review some clinical examples to illustrate the above points

Workshop Outline

- **Part 1: Video Otoscopy Background**
  - Why VO is critical
  - History and types of video otoscopes
  - Tips, tricks and recommendations
- **Part 2: Video Otoscopy Case Examples**
  - Earwax, foreign objects, and other external ear canal issues
  - Fluid, PE tubes, perforations and other middle ear issues
  - Abnormal / surgical ears

Why do a course on

My last webinar confirms need for education on benefits of VO

Do you use video otoscopy?

- Yes – Always **– 30%**
- Yes – Sometimes **– 25%**
- Never – I don't have a video otoscope **– 45%**
- Never – I don't see the point **– 0%**

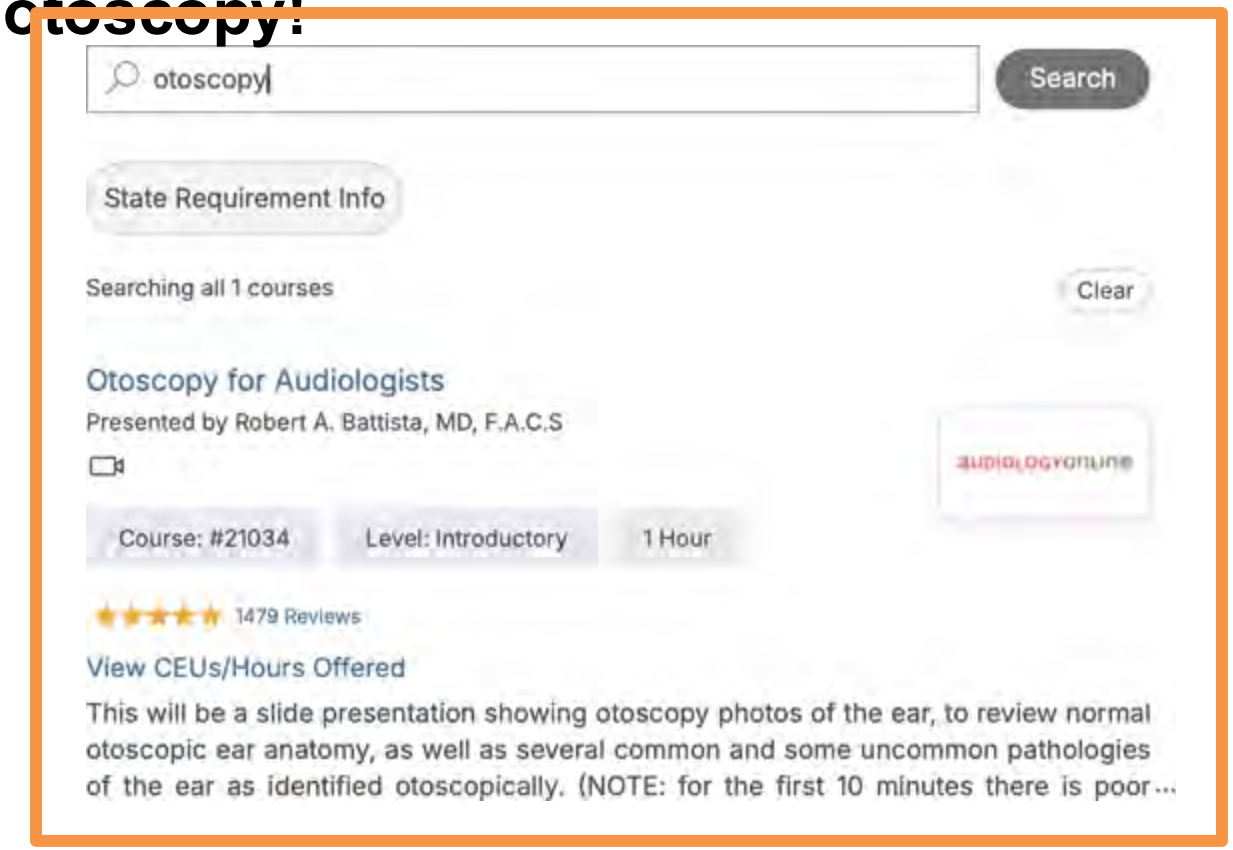
by susan on September 13, 2024
This course emphasizes the need to have updated technology - video otoscopes, etc and to use the equipment during the appointment with the client. It is not that the information is new it is more about why we should be using everything that is available to engage the client in the experience and to educate the client about their own hearing health.

by Anne on September 6, 2024
Good practical hands-on information to improve how I work with patients and run my business.

by Allan on August 22, 2024
Too much common sense... and you have not been practicing long enough to give a truly meaningful discussion on this topic.

Why do a course on

Also, there are 1619 courses on Audiology Online… and only 1 on otoscopy!



Comprehensive overview on normal and abnormal otoscopy

Check it out!

Note: I am not an ENT and

this is not a diagnostic course!

What would you prefer?

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Standard / Traditional Otoscopy

- Bending over awkwardly to look into a patient's ear
- Suboptimal visualization through viewfinder
- One time viewing; no visual record of what you have seen; no possibility of reviewing
- Patient is not included; they cannot see what you see

What would you prefer?

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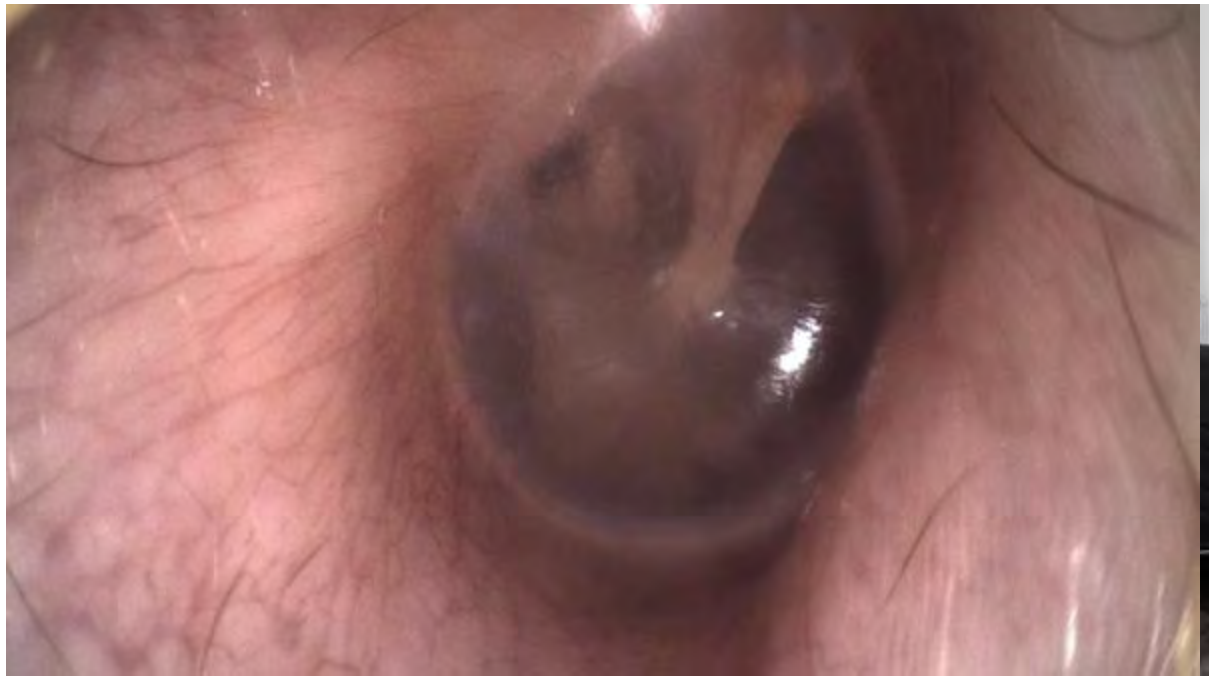
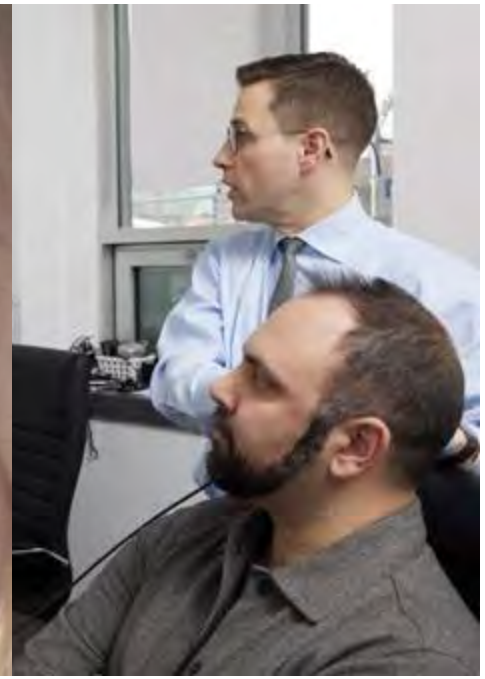
Video Otoscopy

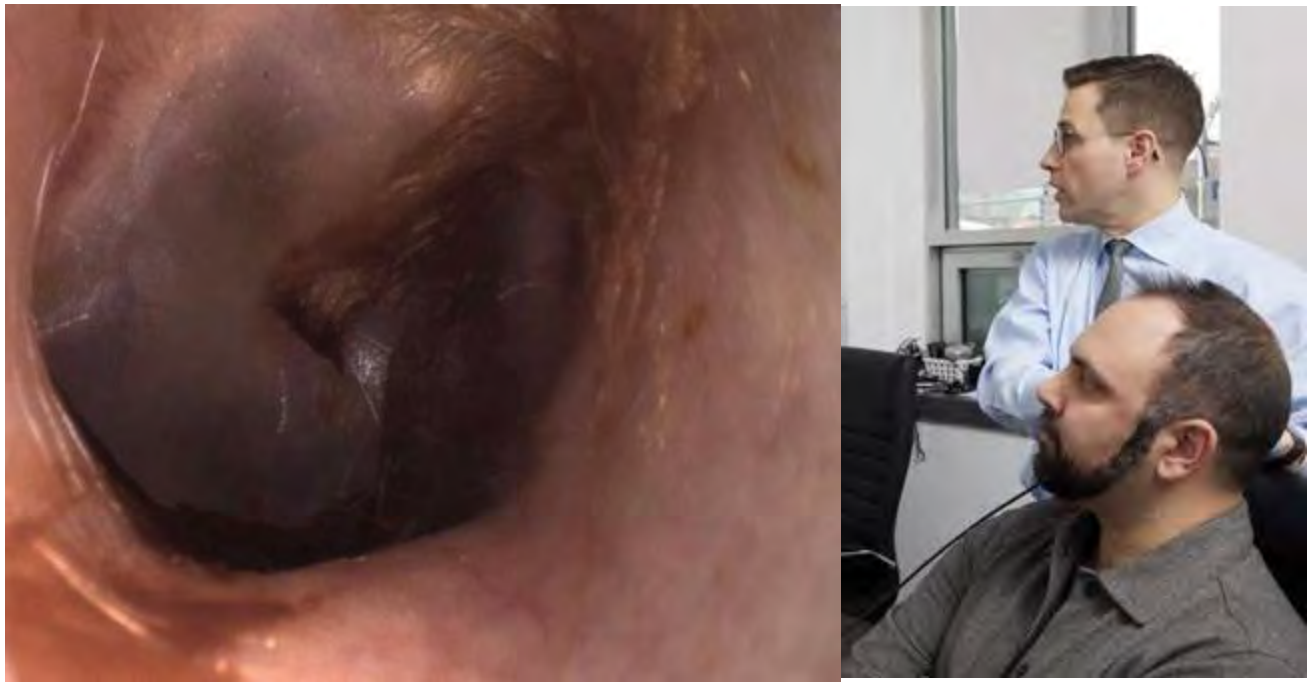
- Ergonomic; no bending
- Exceptional visualization on large monitor
- Documentation for future review
- Patient is included; they see what you see





Why VO?

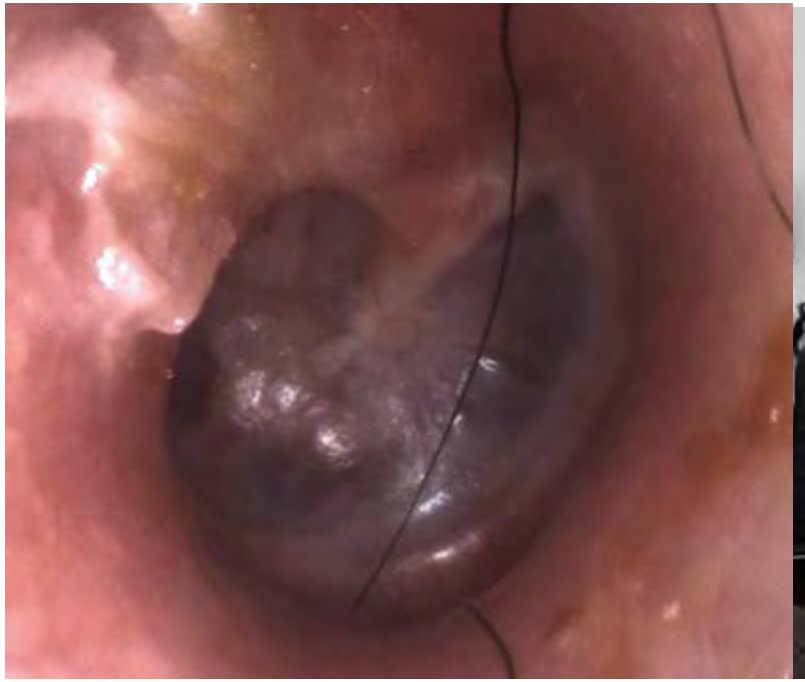
- **Professionalism**
  - Patient's find it impressive and interesting
- **Inclusivity**
  - Patient is included in assessment process
- **Diagnostics**
  - Superior visualization
- **Documentation**
  - Reduced Liability
    - Of clinical interest!

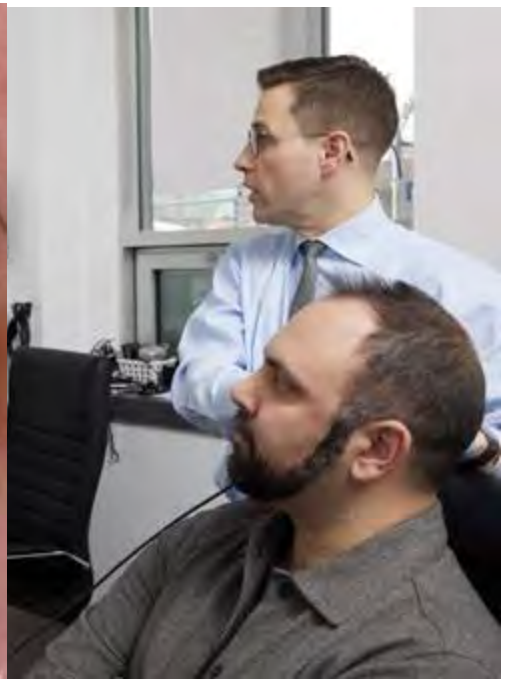


https://youtu.be/0qHnEayh56g?si=jKBm6QRLZ_H6D0f8

Video (or Photo) Otoscopy?

- **We (and the patients) see the live video on the screen**
  - But it is mostly the photo images that we call “VO”





No stock photos:

You will not see any photo credits here; every single image was captured from regular everyday practice

Part 1

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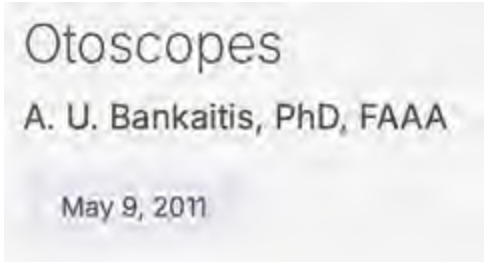
Brief history and

Overview of current VO options

VO History

The first video otoscopes were reportedly introduced in the 1980s



https://www.audiologyonline.com/articles/otoscopes-833

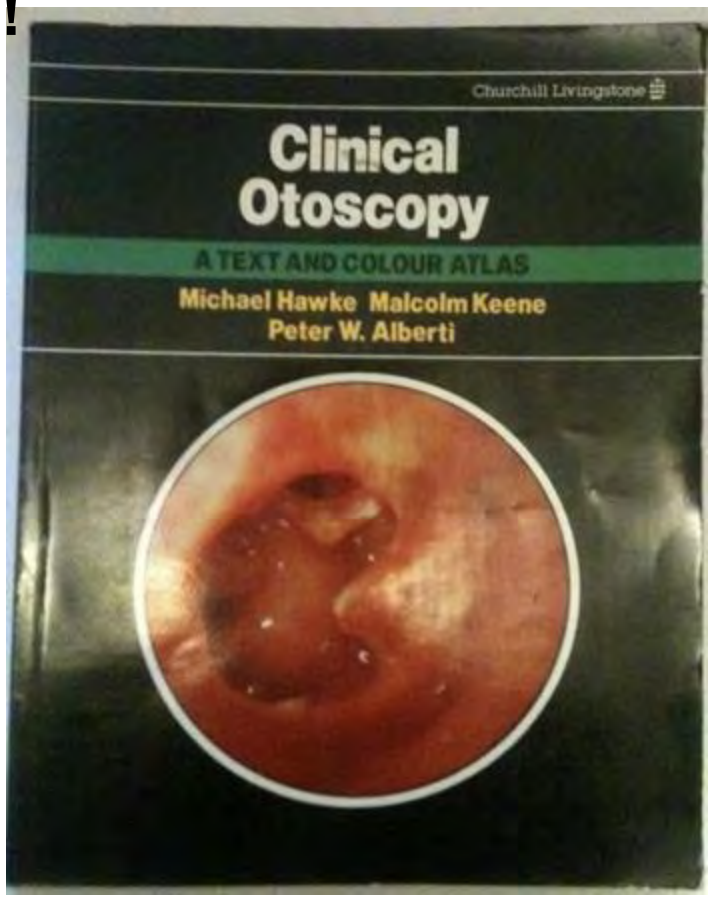
- Originally cost $20,000.
- A few years later, a less expensive version came out, but was cumbersome
  - if you wanted to capture images, you had to invest another $1k for the software

…yet the advantages then are the same as now:

- Video otoscopes offer the advantage of projecting the tympanic membrane in a larger manner on a monitor
  - offering a much more detailed view of subtle structures.
- Unlike traditional otoscopes, video otoscopes are also designed to capture images
  - The integrity of the ear canal and tympanic membrane can be documented prior to and immediately following clinical procedures such as cerumen removal and earmold impressions
    - It also enables image sharing for educational or consulting purposes.

VO History

Michael Hawke's "Clinical Otoscopy: A Text and Colour Atlas" was released in 1984!



According to the University of Toronto he is pioneer in medical photography

- Reportedly has over 10,000 photos of the ear in is personal library

Toronto has a history with VO

- Otosim is a Toronto-based company that provides otoscopy training based on VO images

https://otosim.com/info/about

VO History

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Michael Hawke's "Diseases of the Ear"

(1994) A Pocket Atlas

He notes that, for all images he uses the: "Hopkins Rod Tele-Otoscope"

- I have never used this more medical-looking otoscope, but…
  - Photo quality is obviously great!

https://www.karlstorz.com/de/en/product-detail-page.htm?productID=1000130938&cat=1000071971

My Early VO Experience

When I started in grad school in 2012 there was <u>not</u> a focus on VO

- Which is strange, considering the teaching opportunities

This is what our video otoscope was in the student lab!

- It was on a rolling stand, like an old schoolroom TV
  - i.e. for special purposes only (e.g. VO demonstrations)
    - Definitely not a staple for everyday use
- When I working clinically there was a really nice VO
    - But nobody used it!

How would you save photos / video off of this?!

VO heads for Std Otoscopes

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Welsh Allyn Macroview - not an ideal solution

- **Not ergonomic**
  - Difficult to push capture buttons due to placement on back
  - Awkward to position due to long handle
- **Detachable cable**
  - Always getting unplugged
  - Overall a frustrating user experience

Built-in Screens

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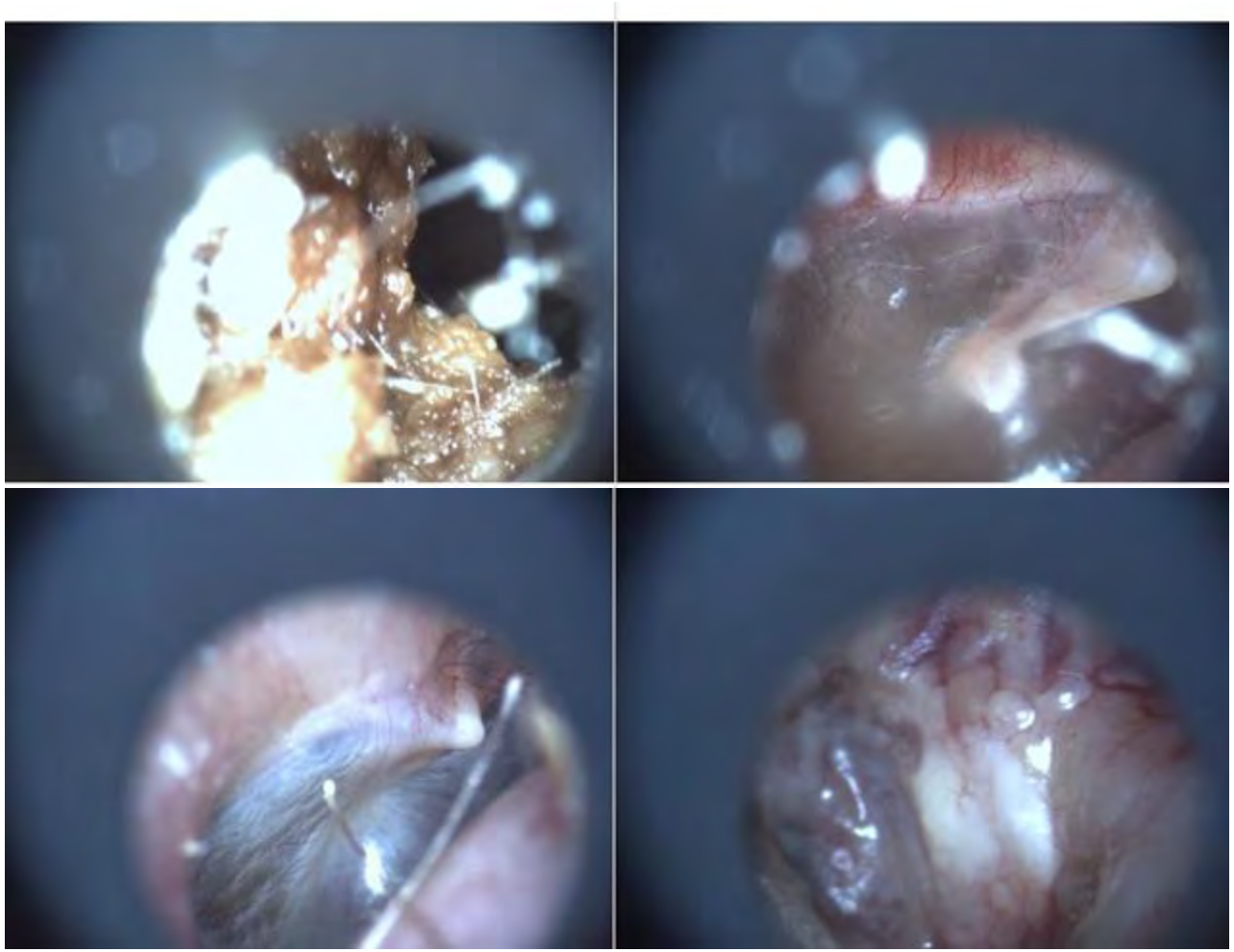
Some VOs have a monitor built-in

- **Benefit**
  - Great for home visits or waiting room, as it does not require a computer
- **Downside**
  - Anything with a handle design can be a little awkward to angle around the patient's shoulder
    - Note the angle of these photos

Limited Field of View

A broad field of view is really important…

- Specula on some models can limit this significantly
  - Note these photos from my Horus scope
    - Firefly is even worse!
- Others can really expand this
  - The Inventis Harmonica has a wide view, that gives not only a view of the TM, but the ear canal as well



- See next slide

Field of View

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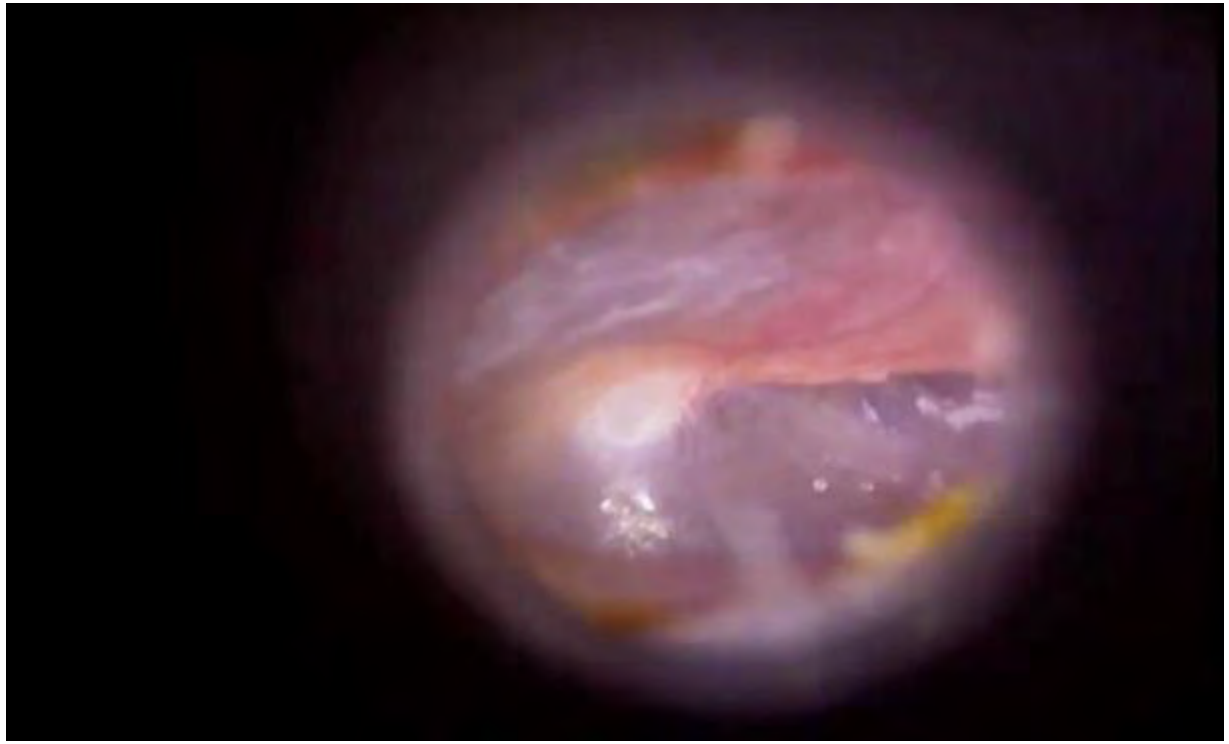
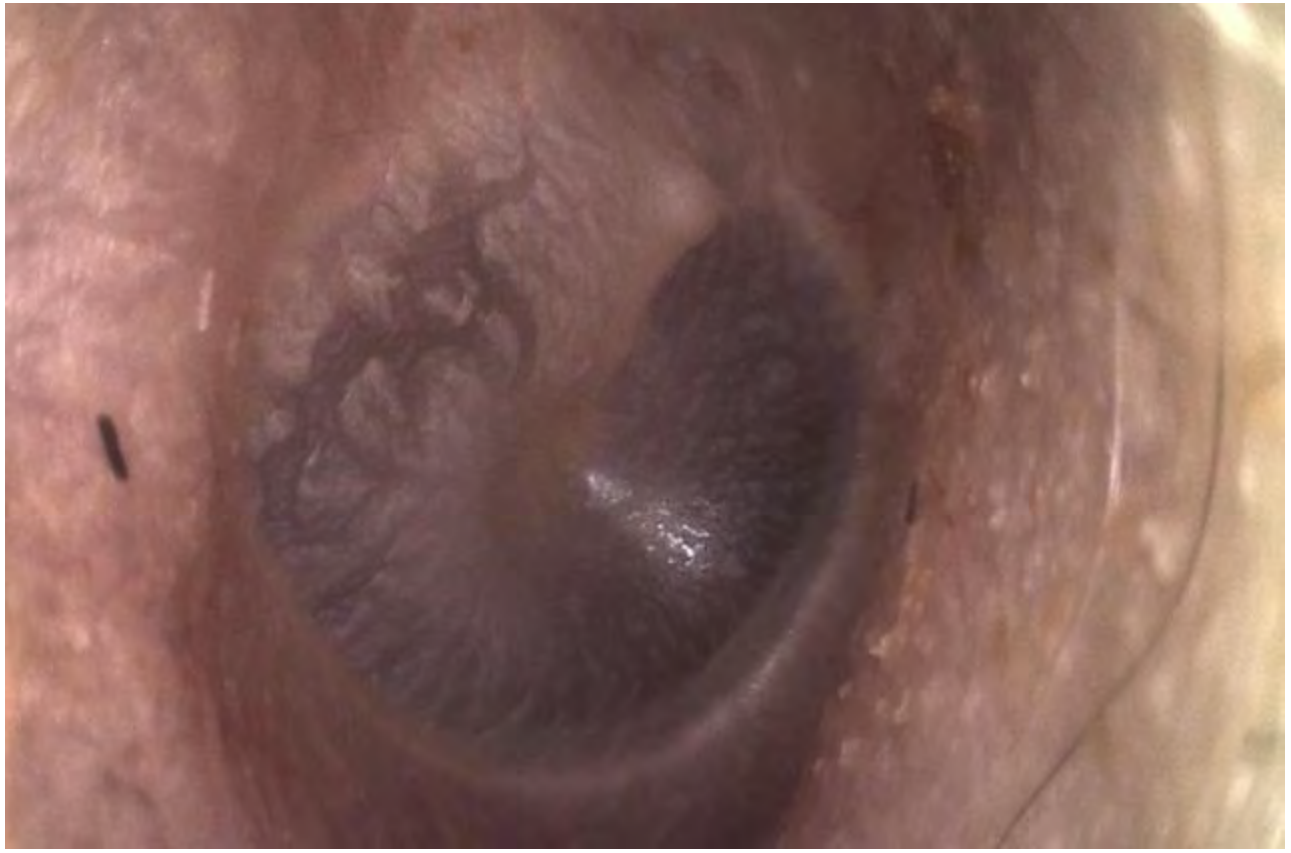
Firefly vs Harmonica



Extremely Narrow



Extremely Wide

Extensions using cellphones

E.g. New WA Macroview with attachment

- **Still awkward to orient**
  - Not only do you have a handle, you also have an iPhone!
- **Standard clinical set up:** hard to access photos
  - They are on your phone not your
    - PC / NOAH / OMS
    - **Pro:** Very handy for Social Media uploading of video / photos
      - **Pro:** easily takes video!

Inexpensive Options

It is now possible for anyone to get a video otoscope

- **Some of your patients may already have these!**
  - Most do not support the use of ear specula
  - PC-based ones often use the camera feature of computer and thus <u>images are flipped/reversed</u>
    - Right ear looks like left and vice versa!
  - Inadequate for a professional hearing clinic
    - However, it is better than nothing!

Gold Standard

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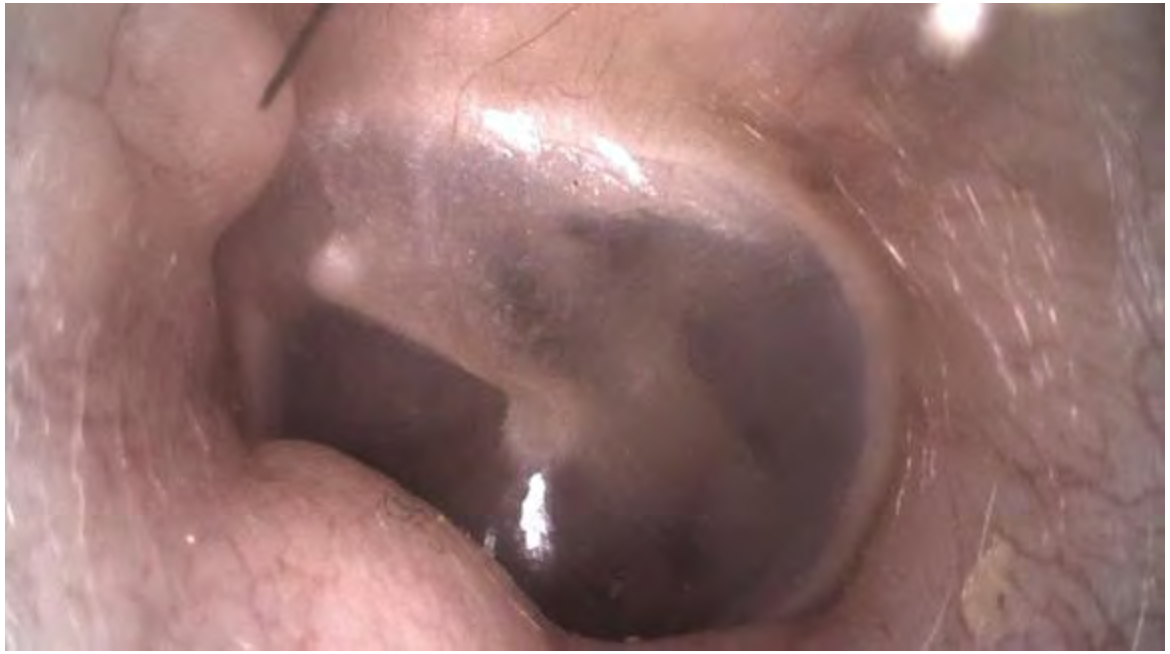
Hand-held, wired, USB powered, NOAH compatible

- Horizontal design, pencil-like, hand-held
  - Easy to hold and manipulate
    - Easy to orient straight up
- Connects with NOAH
  - Viewing/printing from within manufacturer's suite
- Good reporting / printing options
  - Otoscopy on audiogram report



Gold Standard

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Just about all manufacturers have one now!

- Inventis Harmonica
- Natus Otocam
- MedRX VO
- GSI VO
- Interacoustics VO

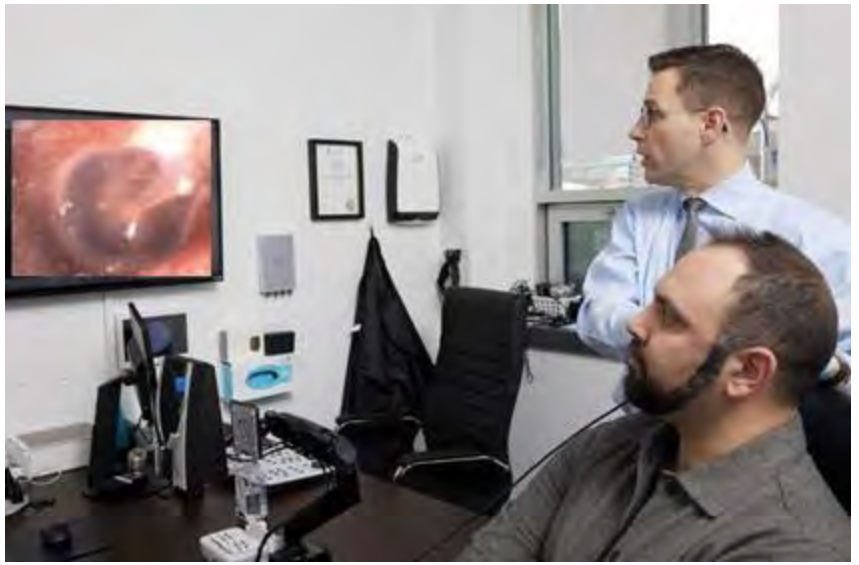
Price Comparison

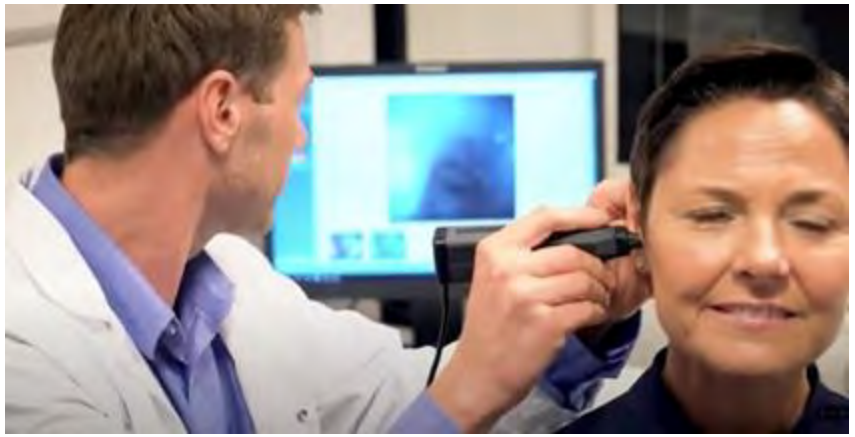
- **Amazon Special (USB only or with screen)**
  - Under $40 - $150
- **Traditional Otoscope (New Welsh Allyn Macroview with cell phone adapter**)
  - About $1500 CDN, plus cost of coupler and cost of phone
- **Professional otoscope with built-in screen, also compatible with computer**
  - Horus scope – around $2k
- **NOAH-compatible, clinical VO**
  - Inventis Harmonica – About $3k CDN, after taxes
    - Other manufacturers are similar price +/- $500

VO

This is a matter of preference but can also be device specific

- **Standing**
  - Underhand
    - Snap photo with thumb
- **Sitting**
  - Overhand, pencil grip
    - Snap photo with index finger





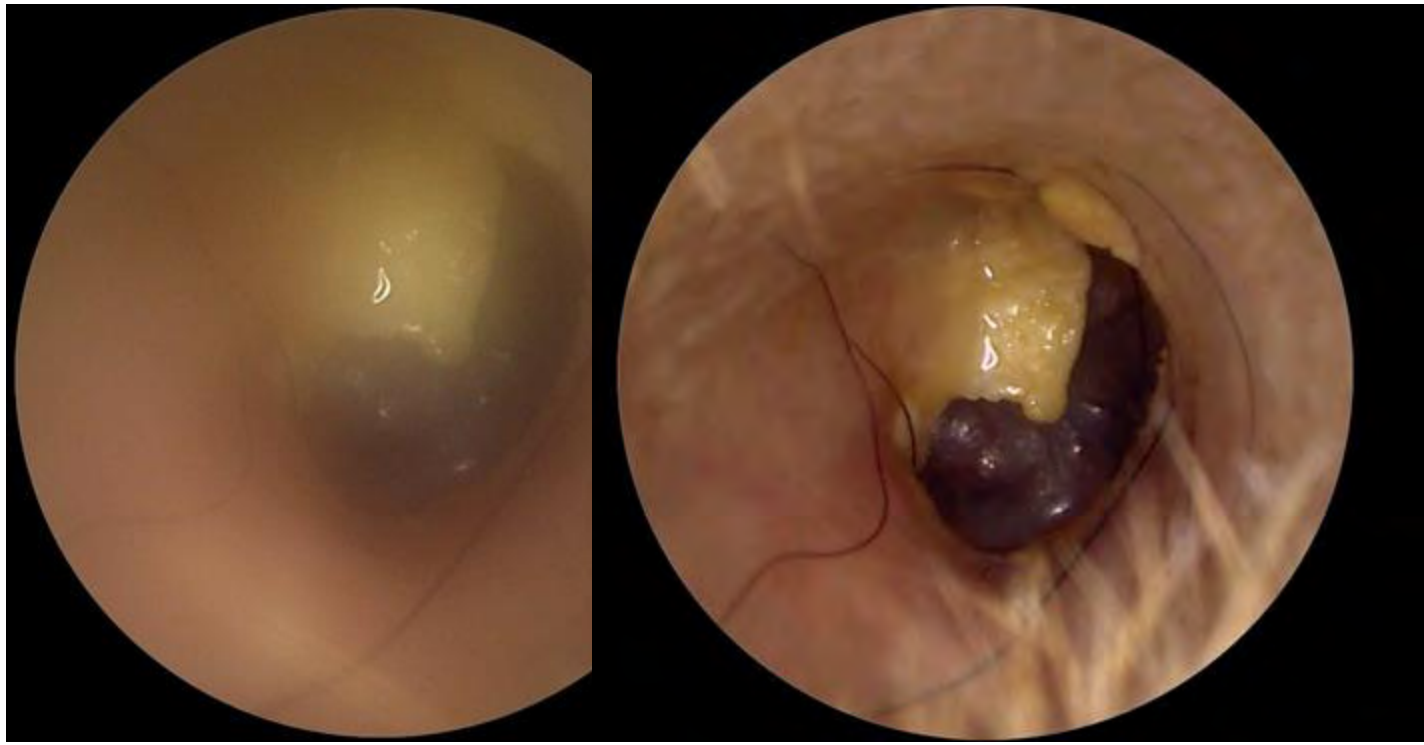
What is wrong with this picture?!

Tips for a good

If you don’t succeed at first, try again

- Focus changes with depth
- Light changes with depth
- It is not uncommon to have to wipe the camera tip with a tissue or sani-wipe, esp:
  - After irrigation
  - Narrow canals
  - Hairy canals
  - Waxy canals

Fogging can occur with some models (see below)

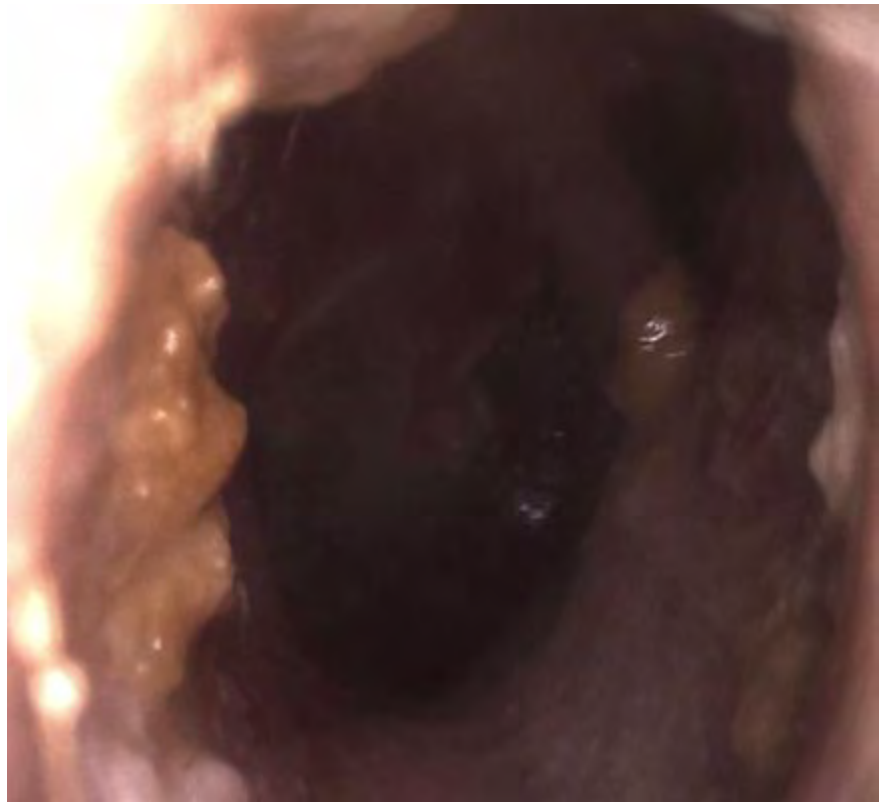


It can take multiple attempts to get a clear shot of the TM, depending on the canal

Tips for a good

Sometimes, you need to accept a suboptimal shot

- Perhaps patient has narrow, sensitive ears and it is uncomfortable going deep in canal
  - Try removing specula to reduce size (sometimes necessary with children)
    - It is not always possible to get a clear, bright shot of the TM
- Something is always better than nothing
  - But diagnosis cannot be based on this
    - Would need try other visualization



Ear canal shadowed, due to waxy, narrow canal

Head-Worn Otoscopy

Let's not forget that using loupes and microscopes is <u>otoscopy</u>

e.g. Heine Loupe or Vorotek OScope

- <u>Binocular Vision</u> for depth perception
  - Extremely bright illumination

Essential for cerumen management

- Oscope: $2700 CDN, after tax
  - Heine loupe: around $3500
- Well worth the cost
  - Wonderful for ear impressions
    - Also great for routine otoscopy

Earwax: Cerumen Removal

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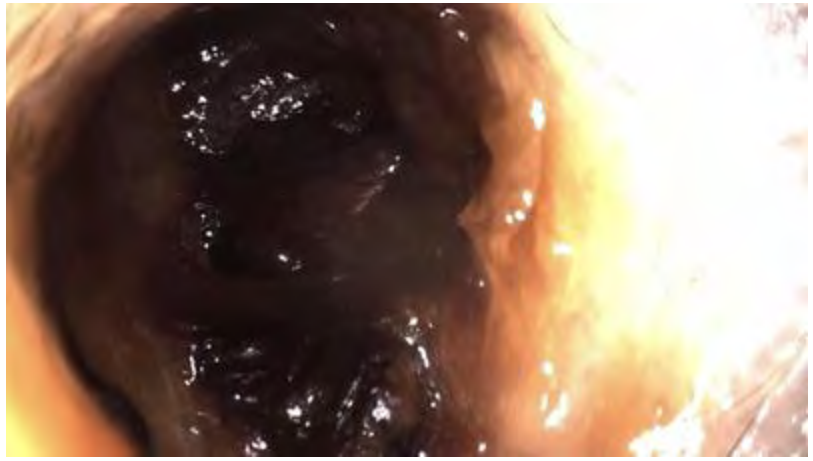
Video otoscopes often come with cerumen removal specula

- But this is not ideal…
  - No depth perception
    - Awkward to use otoscope as a curette
      -



Cerumen Management (CM)

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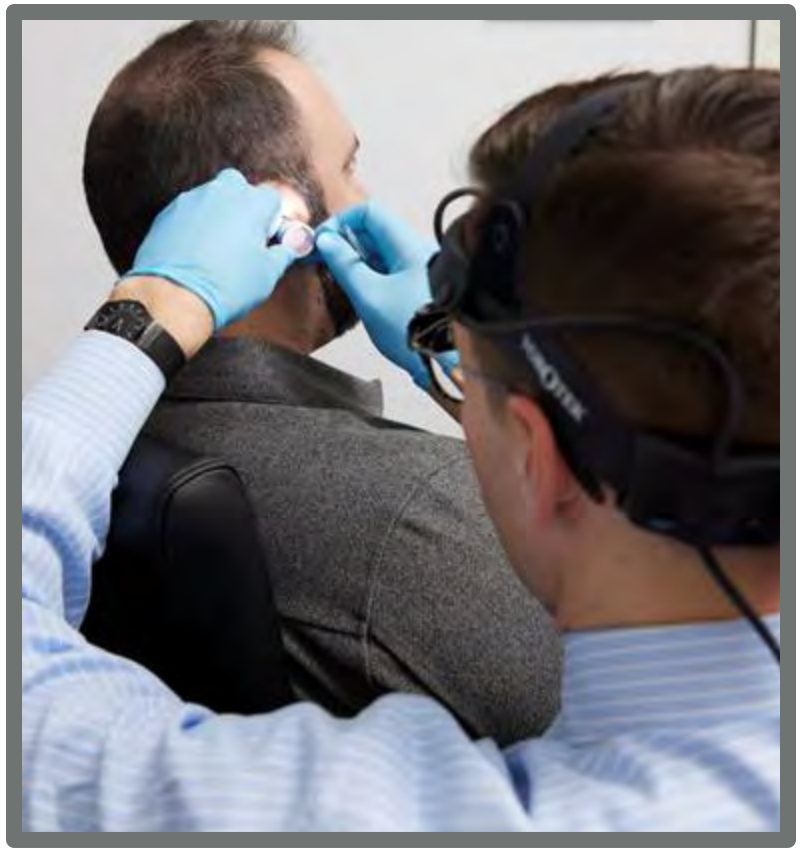
You can't have a hearing clinic without earwax removal…

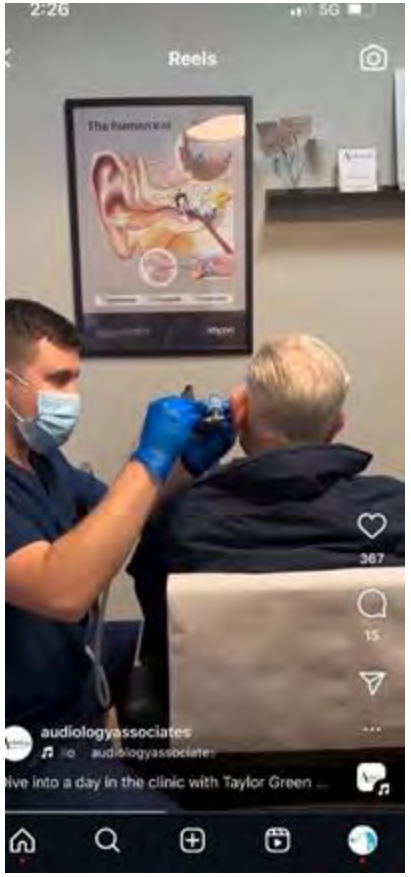
And you can't have proper earwax removal with out head-worn and video otoscopy



Using Otoscopes for

Not an ideal solution!

- **No true depth perception**
  - That means you're guessing on depth
- **Can be difficult to brace the working hand!**
  - **Pro:** Again, ideal option for Social Media videos
  - **Con:** not in the patient's best interest!



Recording Video

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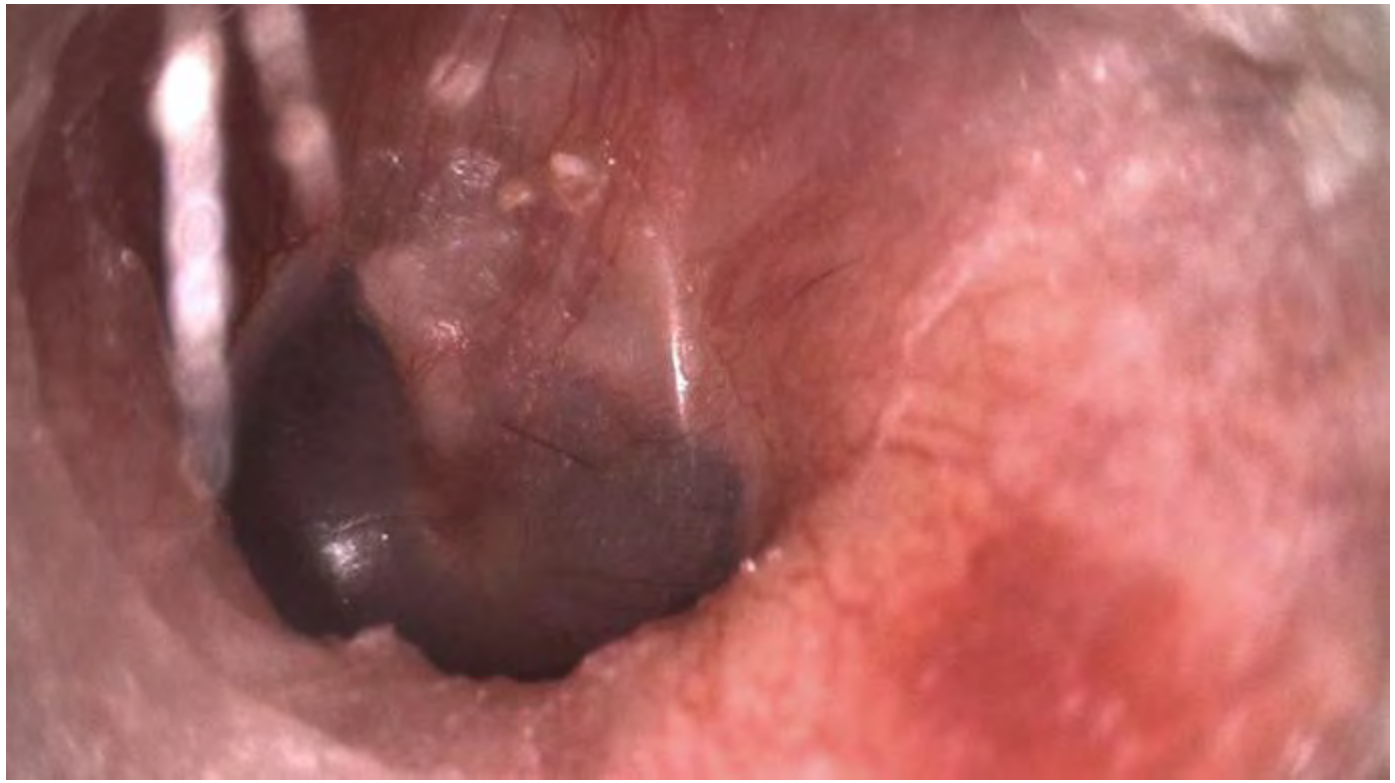
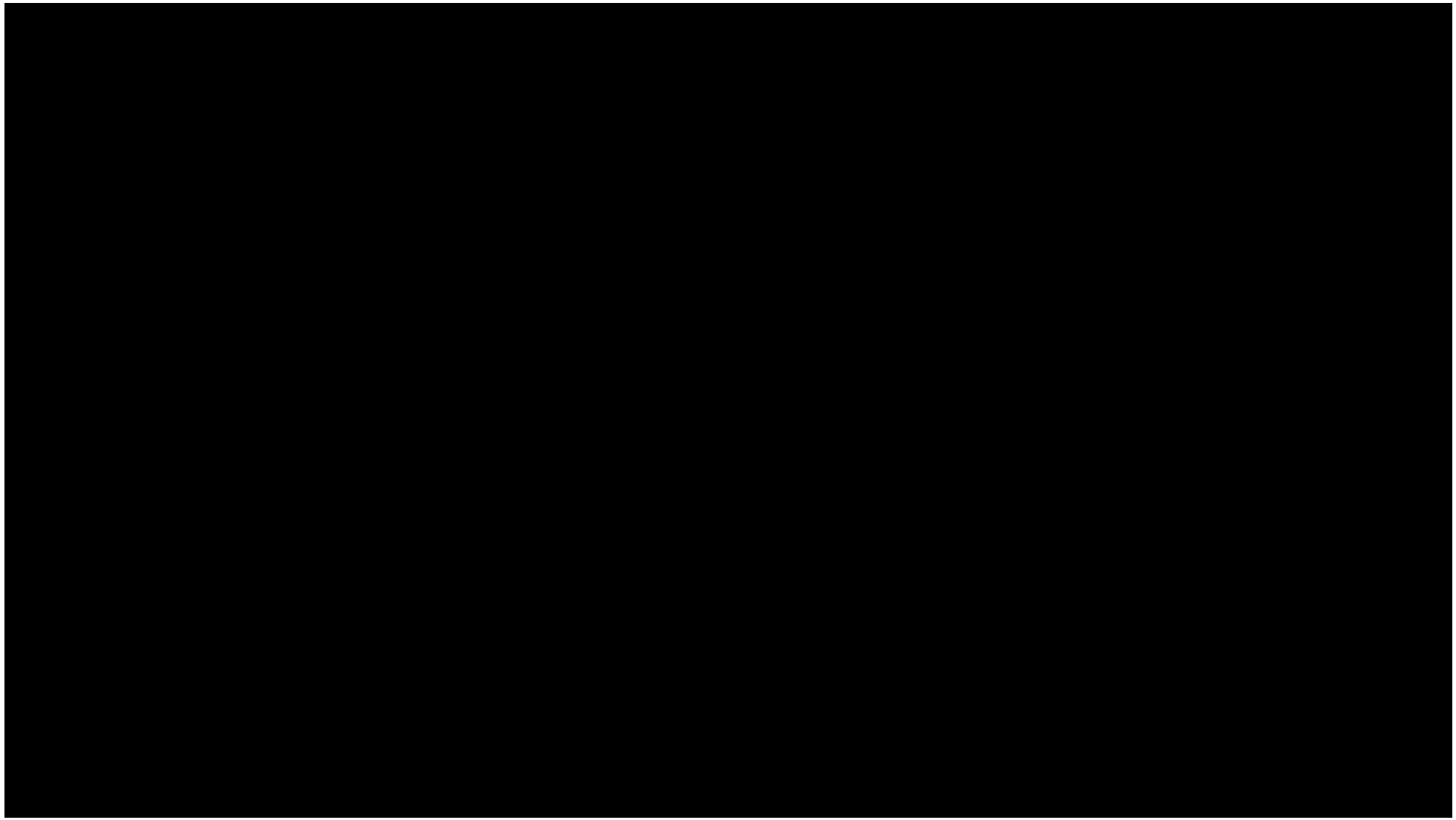
Tip: You can record video with any manufacturer

- Only certain manufacturers allow you to record video and store in NOAH Module (e.g. MedRX)
- But you can always record your screen:
  - Press Windows Button + G to enter “Gaming mode”
  - Record a video of your screen in this mode



…because sometimes a photo does not tell the whole story!

Pulsating Left Eardrum



Part 2

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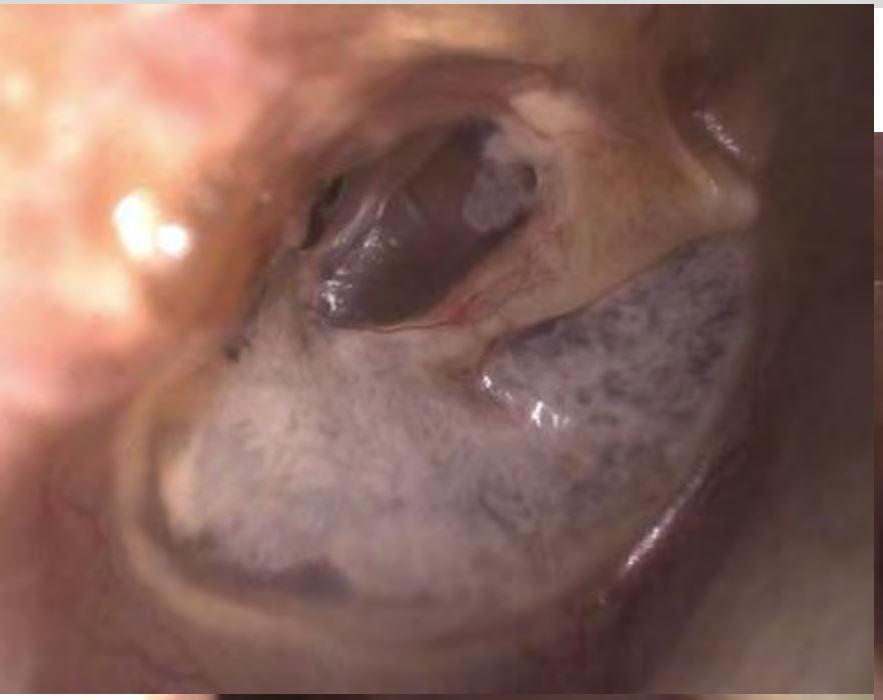
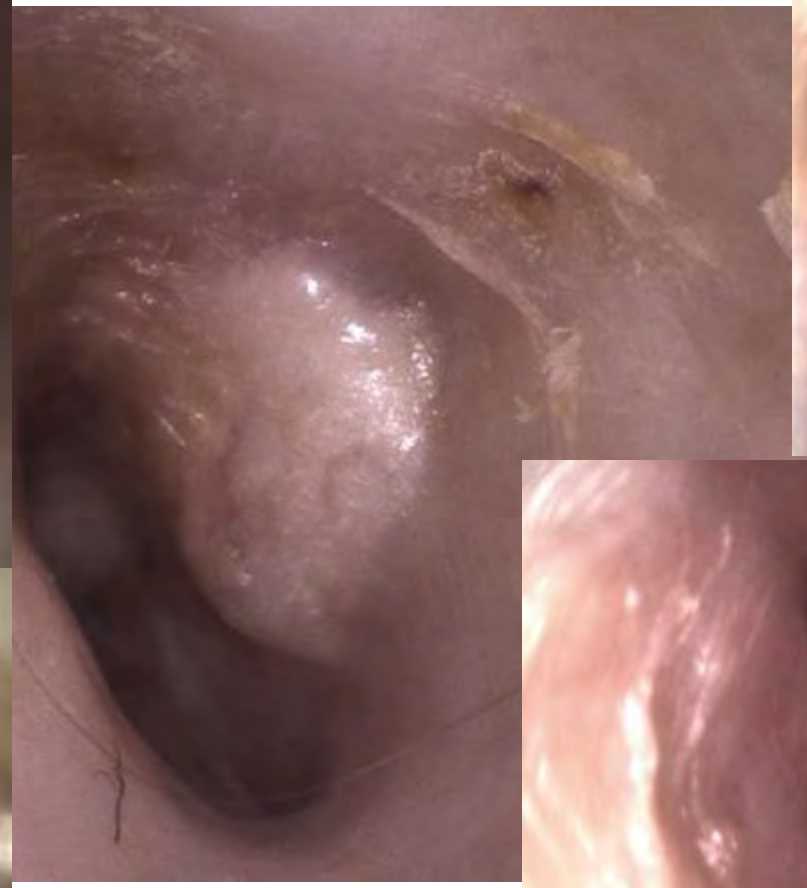
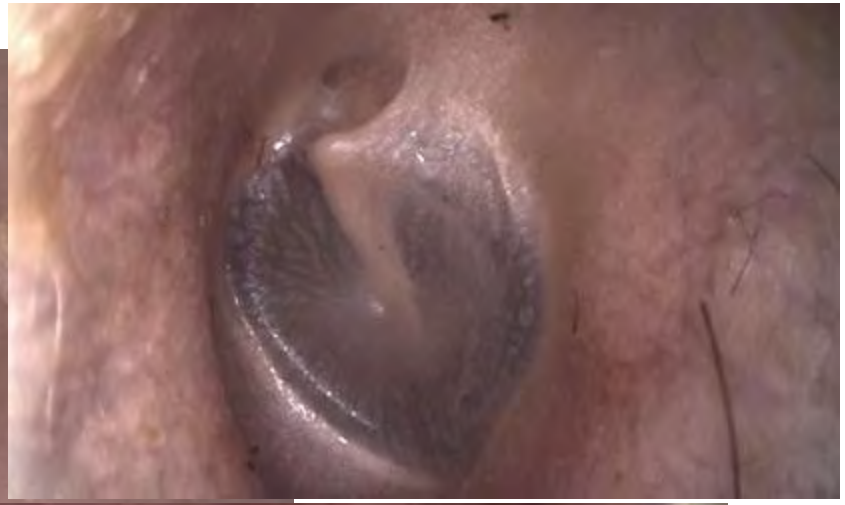
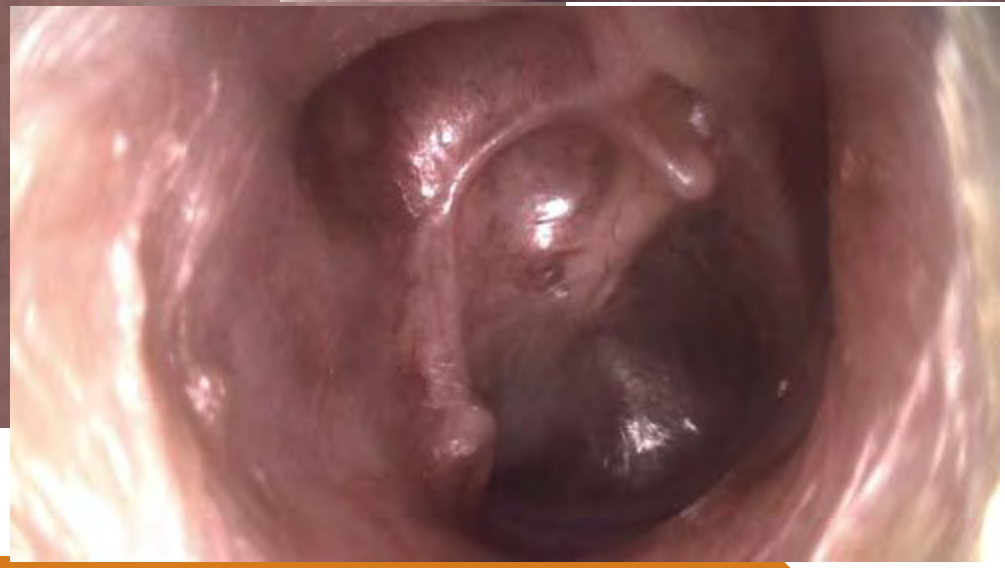
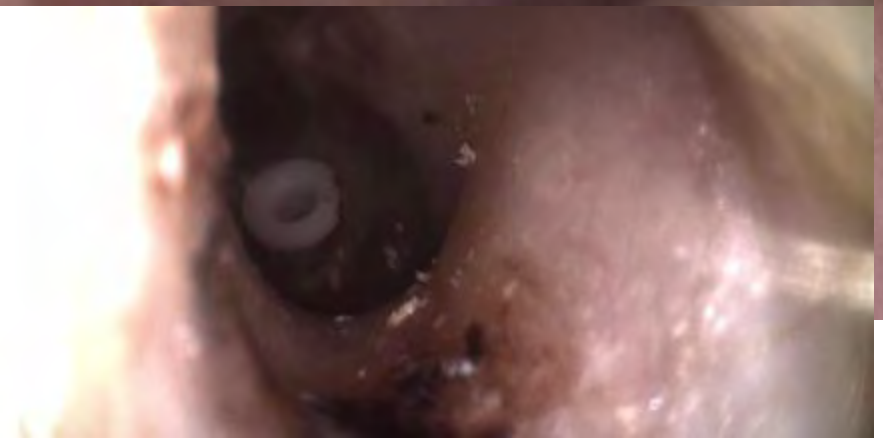
Case Examples











Earwax: Cerumen Removal

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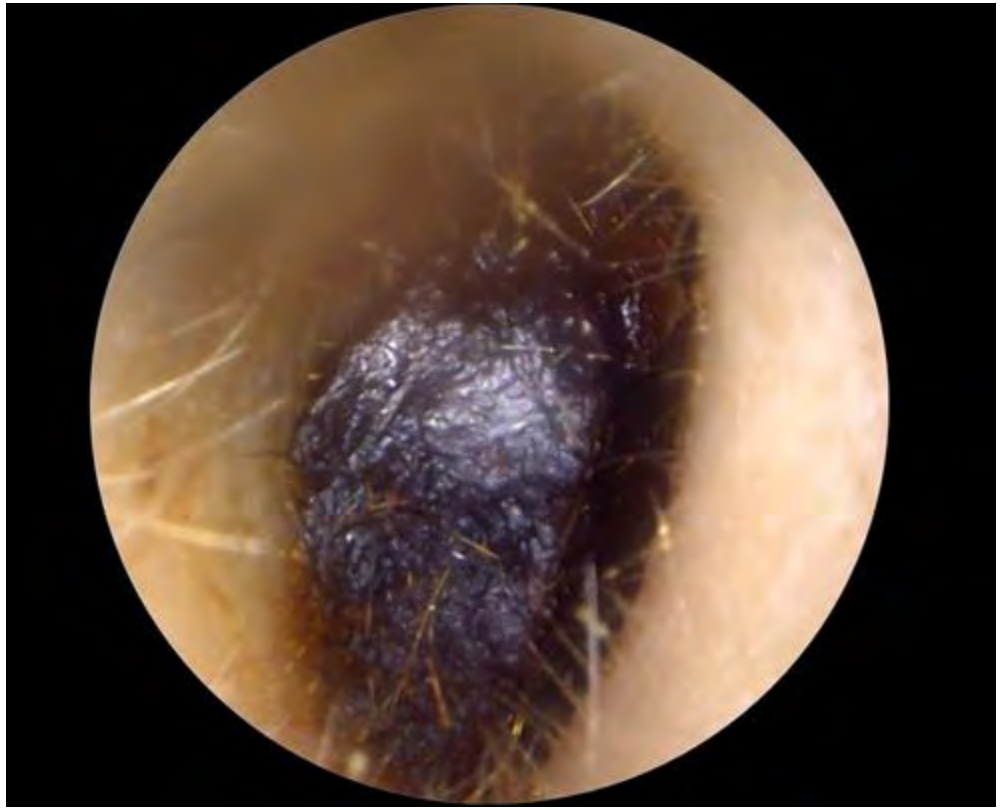
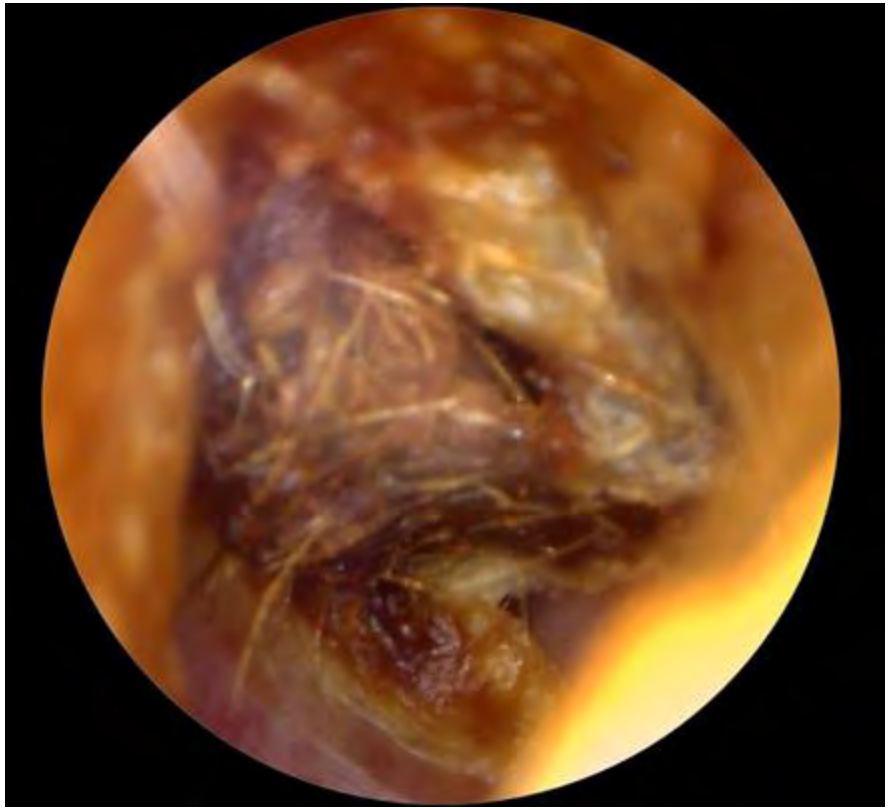
All different types of wax

- Hard, Hairy, Dry, etc..



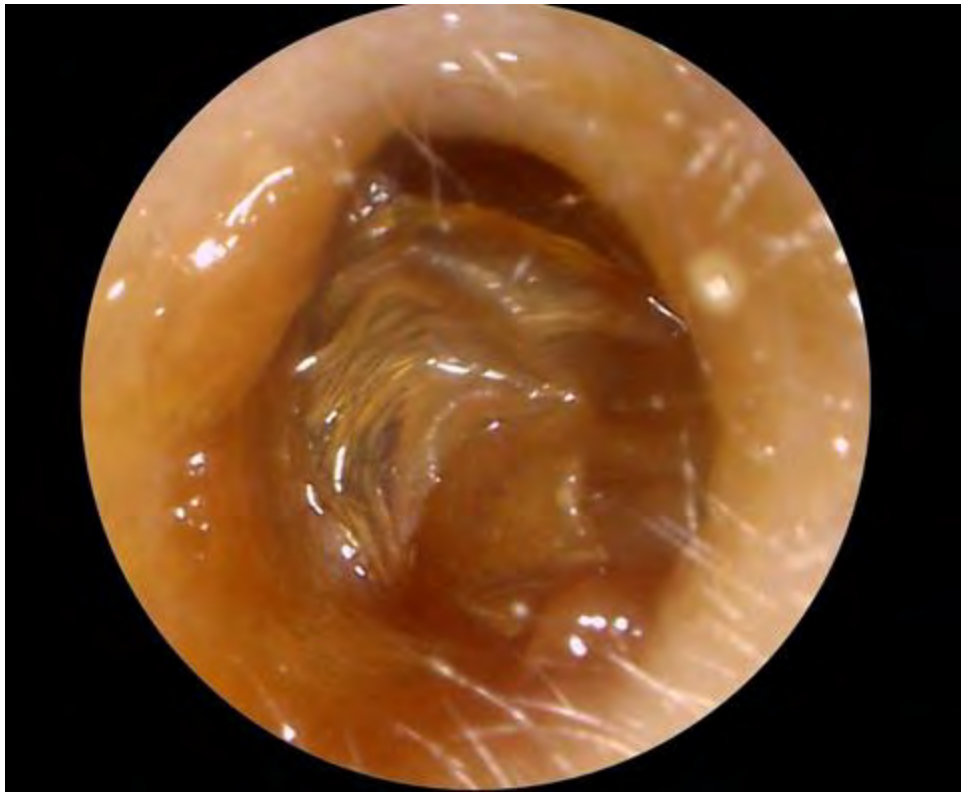


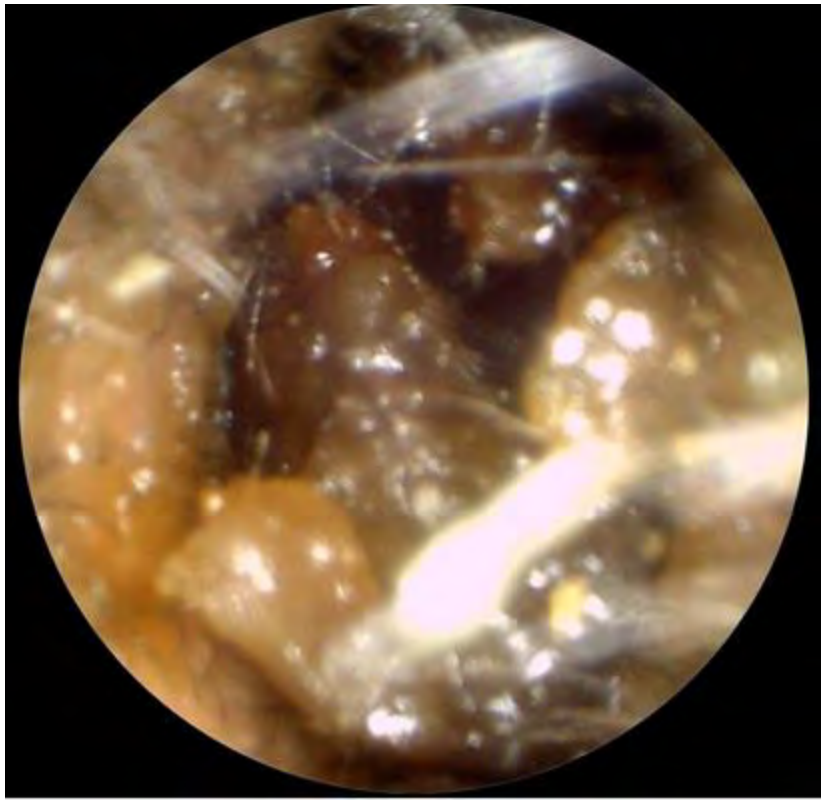
Earwax: Cerumen Removal

academia

All different types of wax

- Skin-like, soft, sticky, etc.

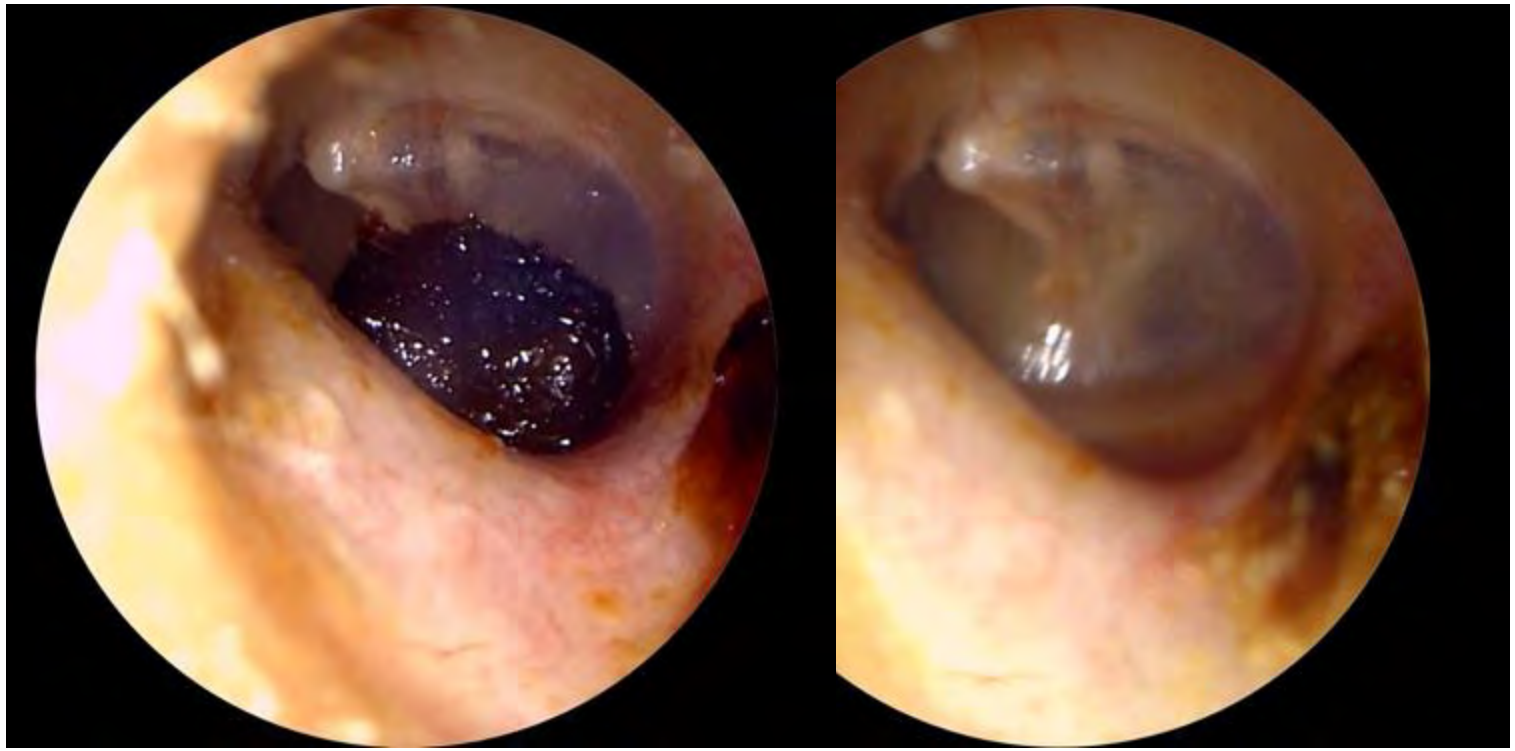




Foreign Object Removal

6 year old boy – Left ear

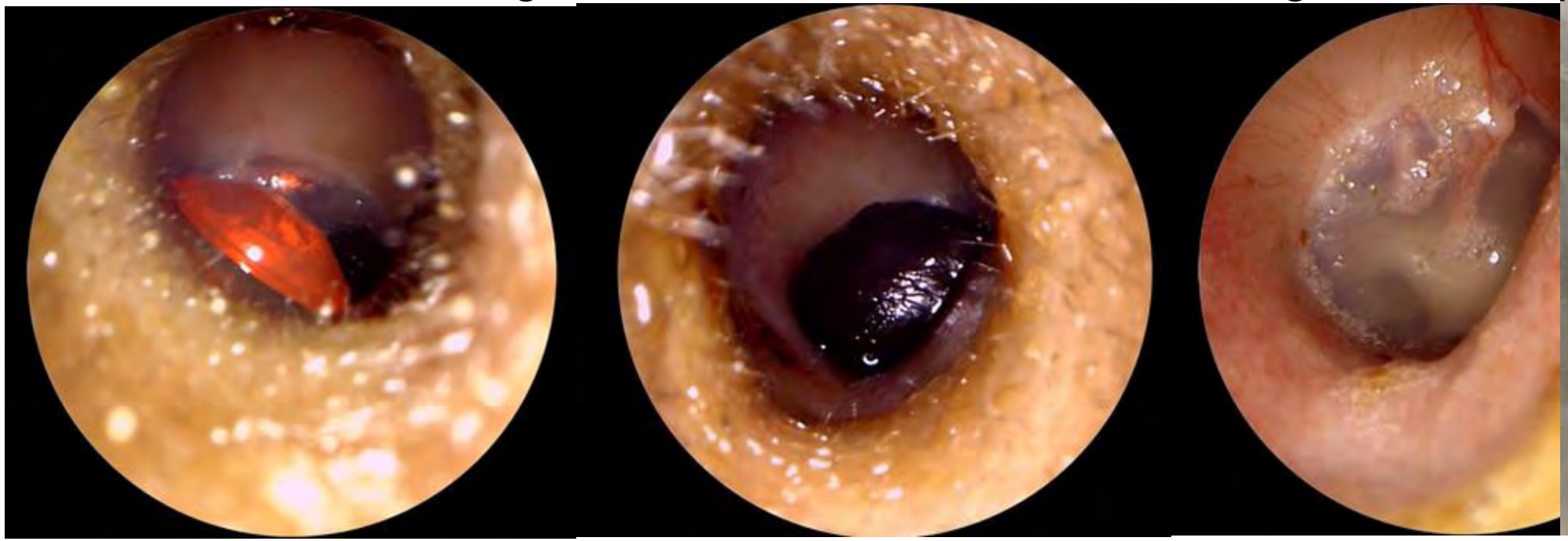
- **Appears to be ball of wax *deep* in left ear canal**
  - This was removed with a curette…
    - After irrigation attempt
  - But it was not just wax!
    - See next slide



Foreign Object Removal

6 year old boy – Right ear

- It was a plastic ruby covered in wax!
- …and there were two of them in his right ear
  - Again, removed with curette after irrigation attempt



Foreign Objects

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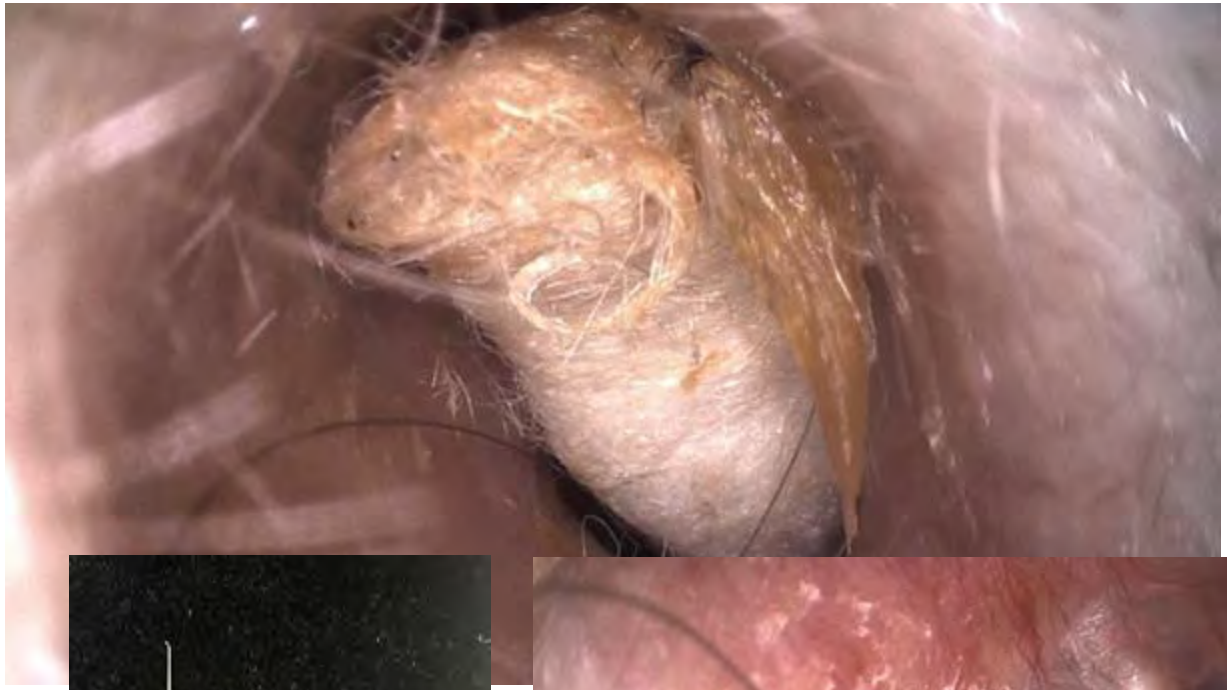
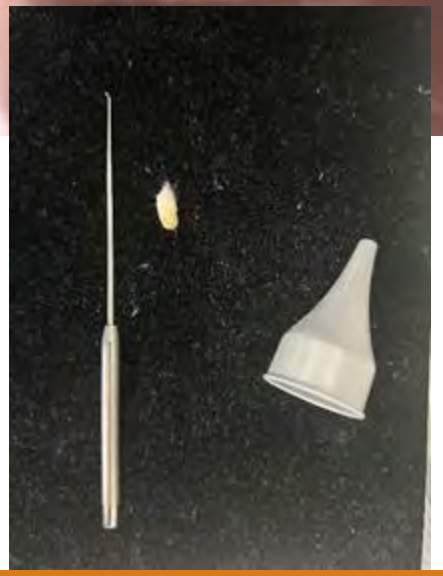
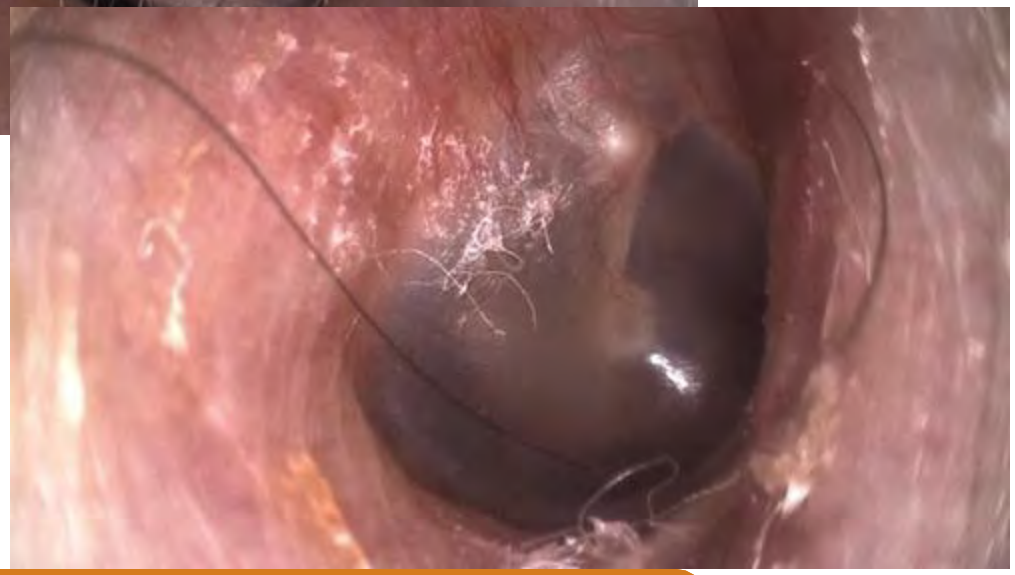
Cotton swab

- **Obviously detached in ear canal when cleaning with Q-tip**
  - Removed with right-angled hook
  - Forceps also would work!







Foreign Objects

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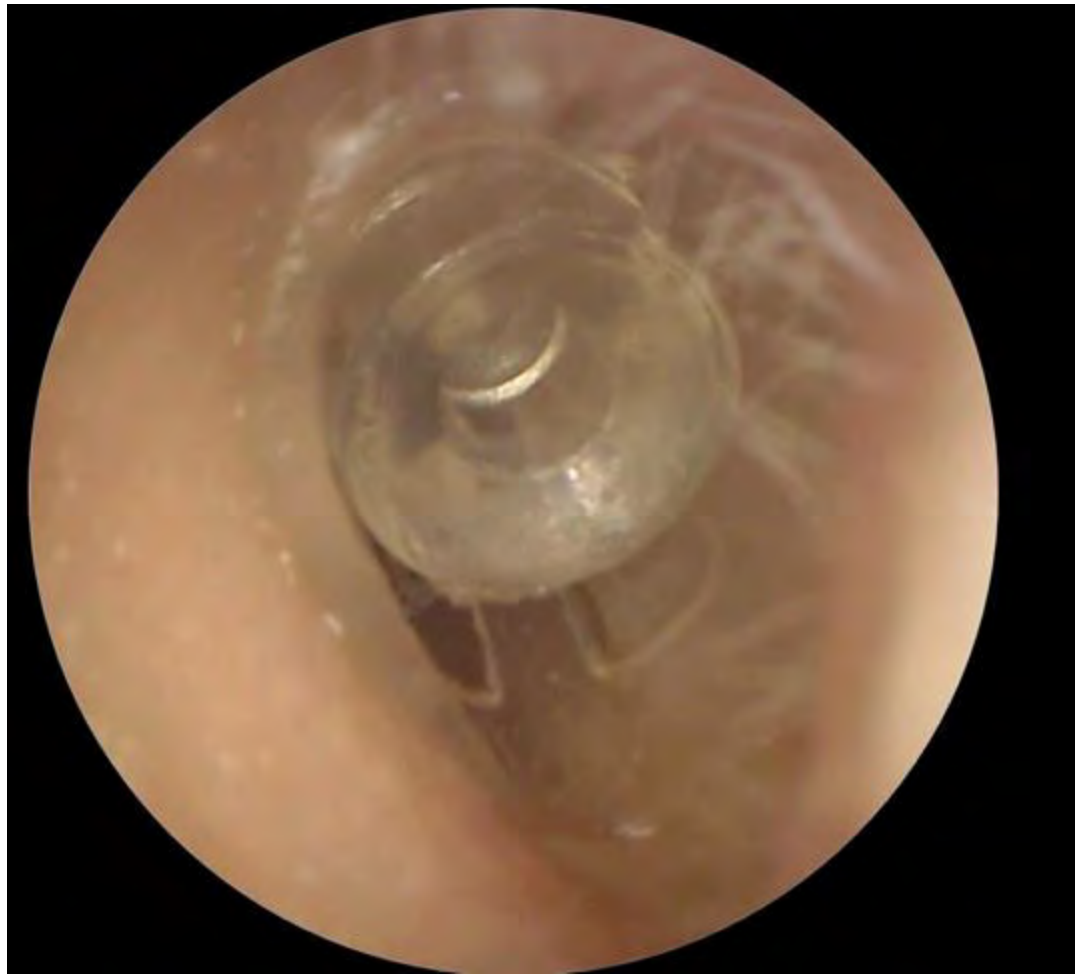
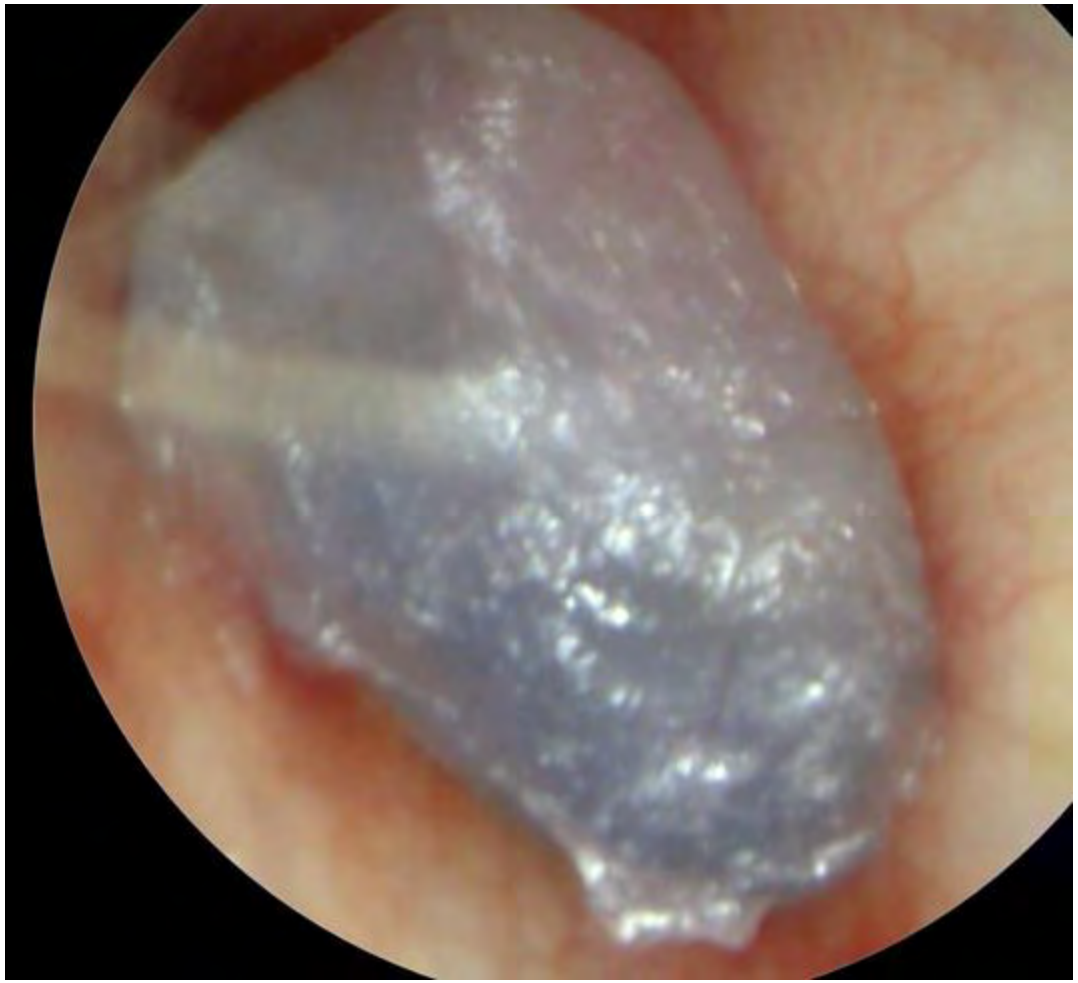
Hearing aid dome



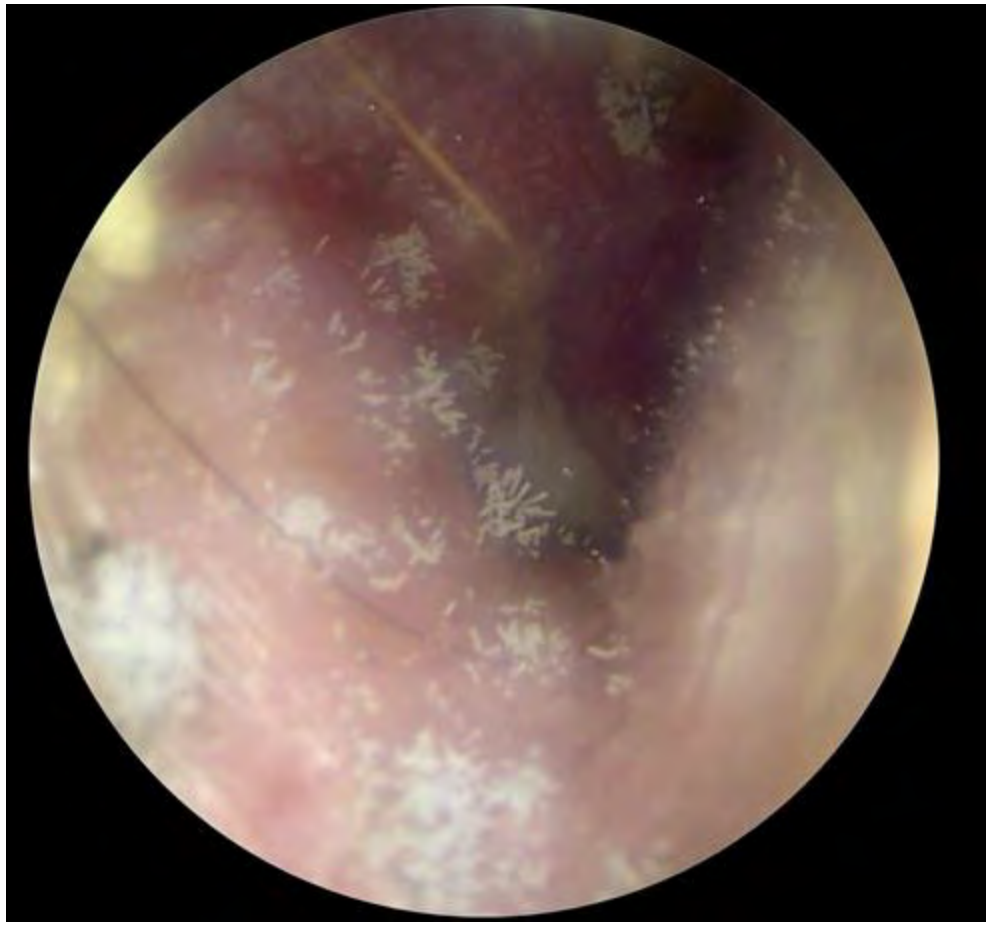
Silicone earplug



External Ear Issues

Fungal infection (Otomycosis)

- This is actually my father's ear
  - Required anti-fungal drops
    - Interestingly this was co-occurring with a sudden SNHL post-COVID



External Ear Issues

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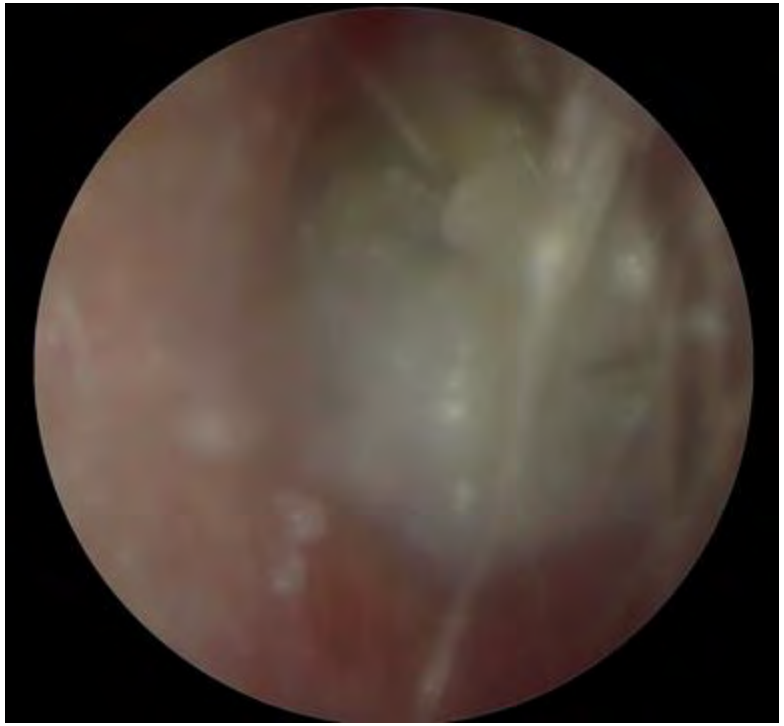
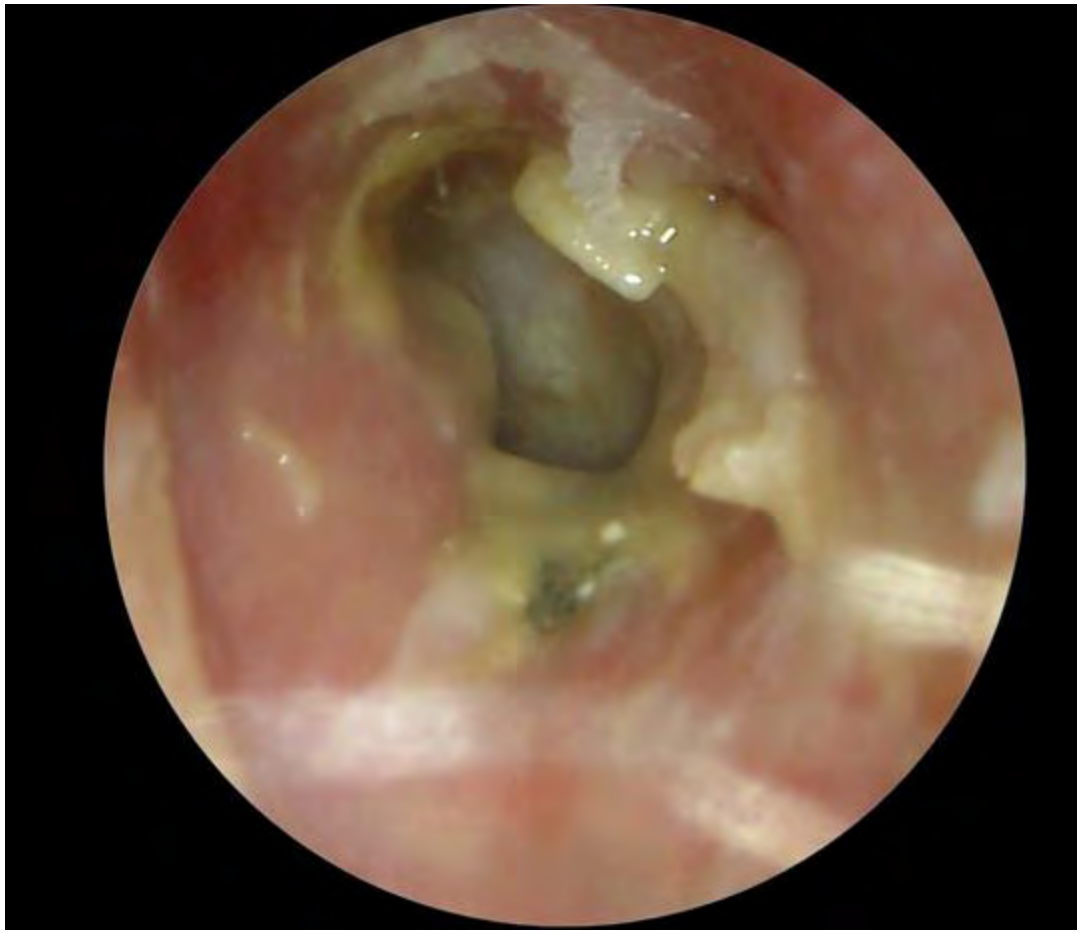
Infection / discharge in ear canal

- Whitish / Greenish discharge

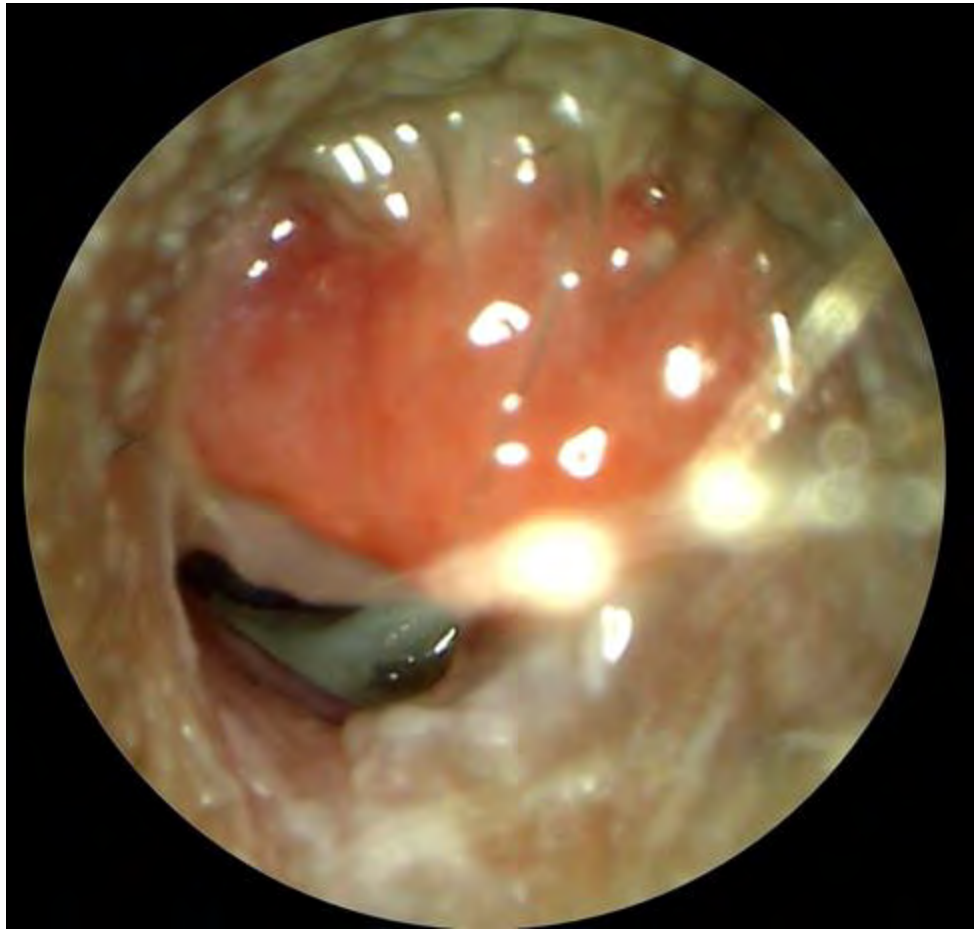




External Ear Issues

Fleshy growth in ear canal

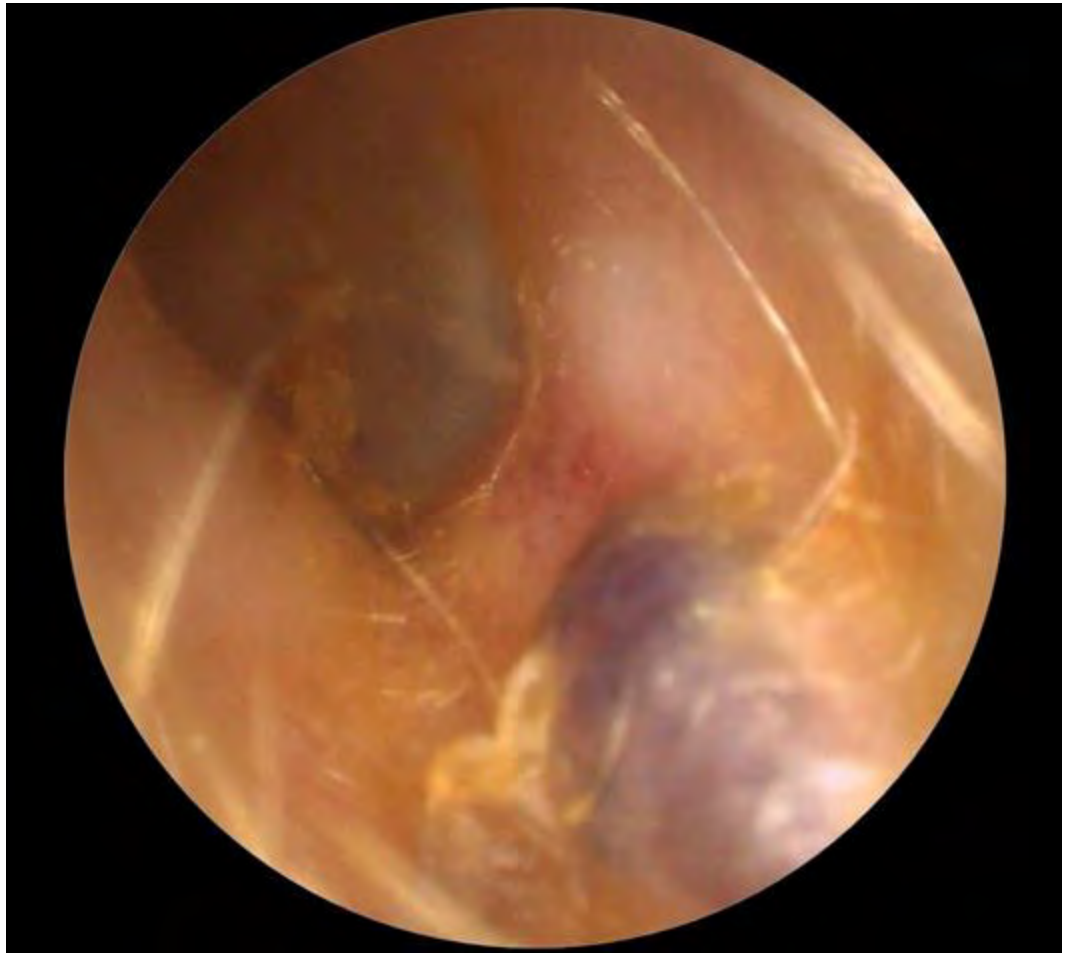
- Was wax stuck behind this!
  - Tymp was normal after wax removal with curette and irrigation
    - Not painful to touch
      - When “palpated”
    - Obvious ENT referral



External Ear Issues

Hard growth in ear canal

- Hard to the touch
  - Patient concerned
    - But not painful
    - Monitoring
      - GP aware



Middle Ear Issues

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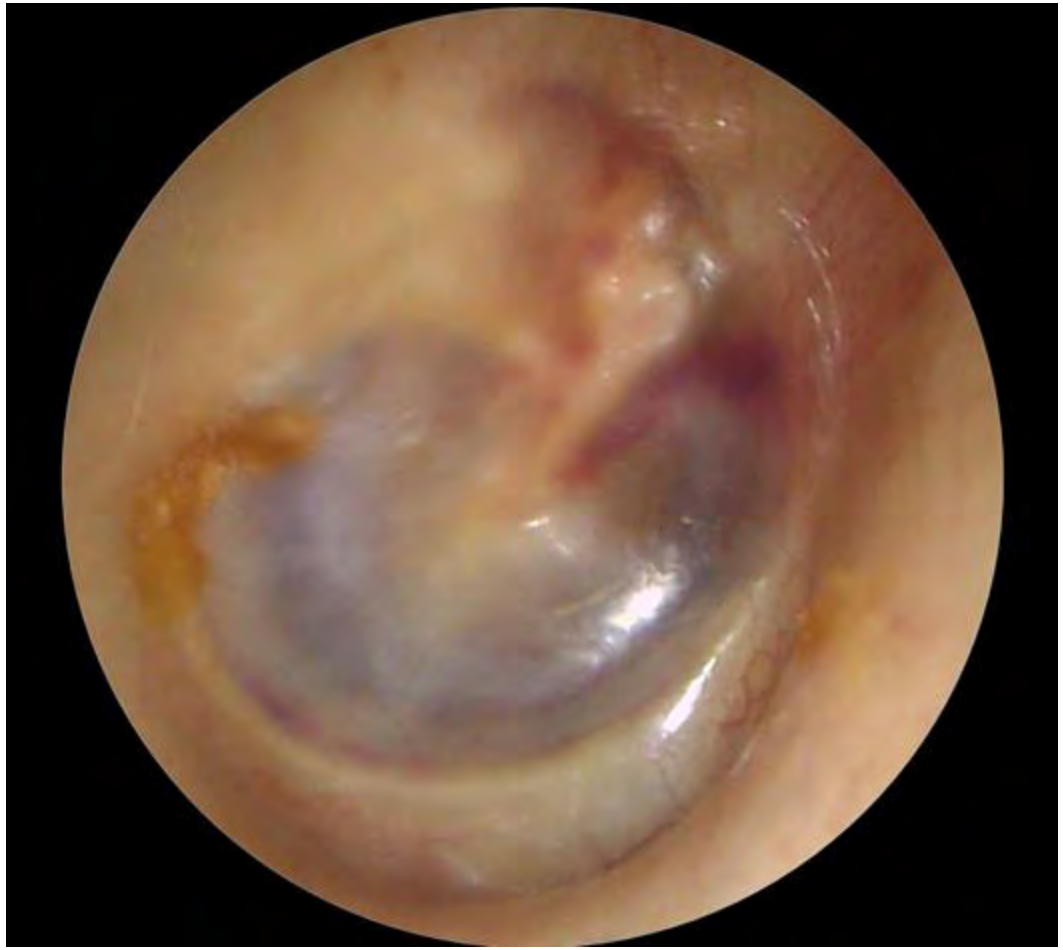
Barotrauma

- After 10 days of treatment
  - Decongestants and steroid nasal spray
    - Shot is a little blurry (sorry!)



Middle Ear Issues

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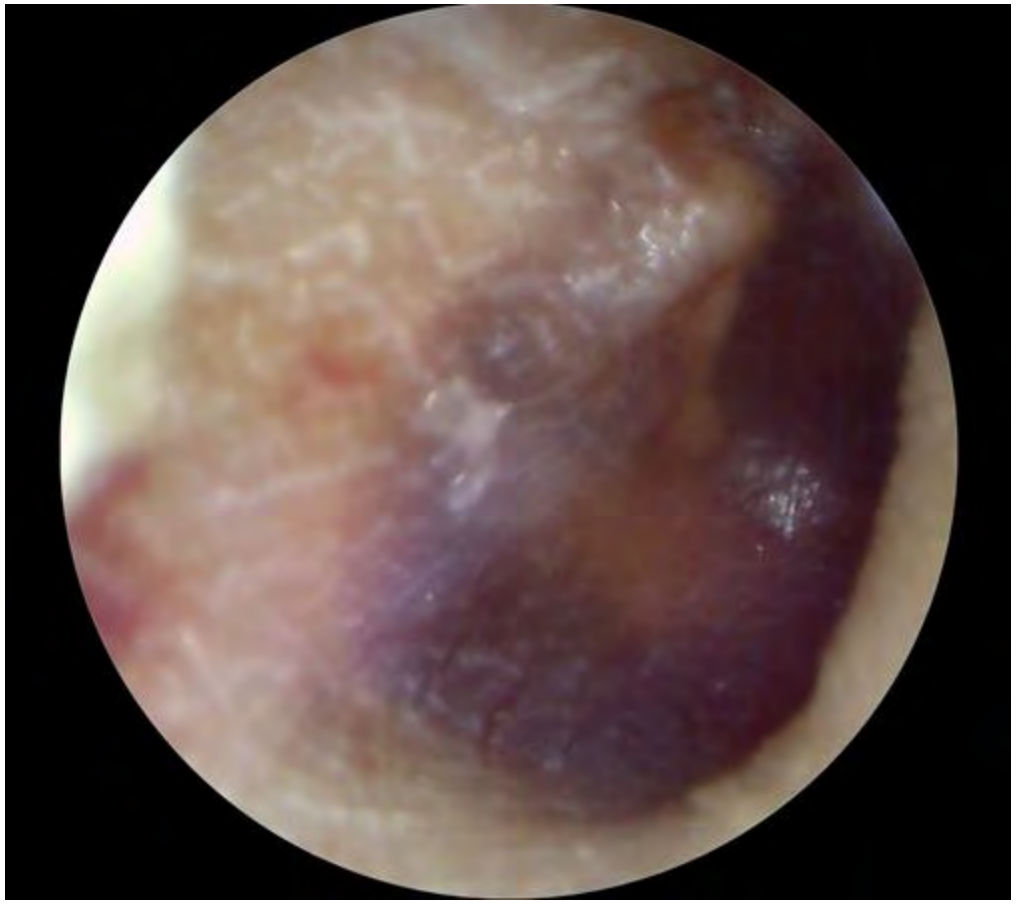
Acute Otitis Media

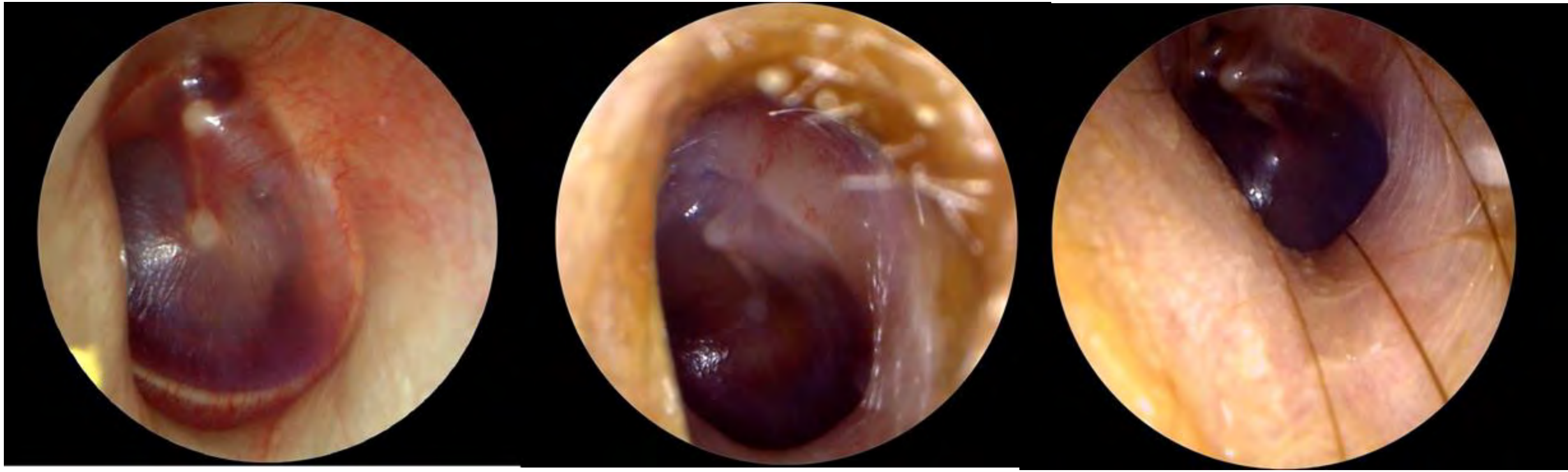
- As diagnosed my GP
  - Doesn’t have quite the classic “bulging”
    - Tymp is flat



Middle Ear Issues

Otitis Media with Effusion (OME)

- Dark Fluid in ME (mucoid?)
  - If there is a peak on tymp, it is often very negative in pressure



Middle Ear Issues

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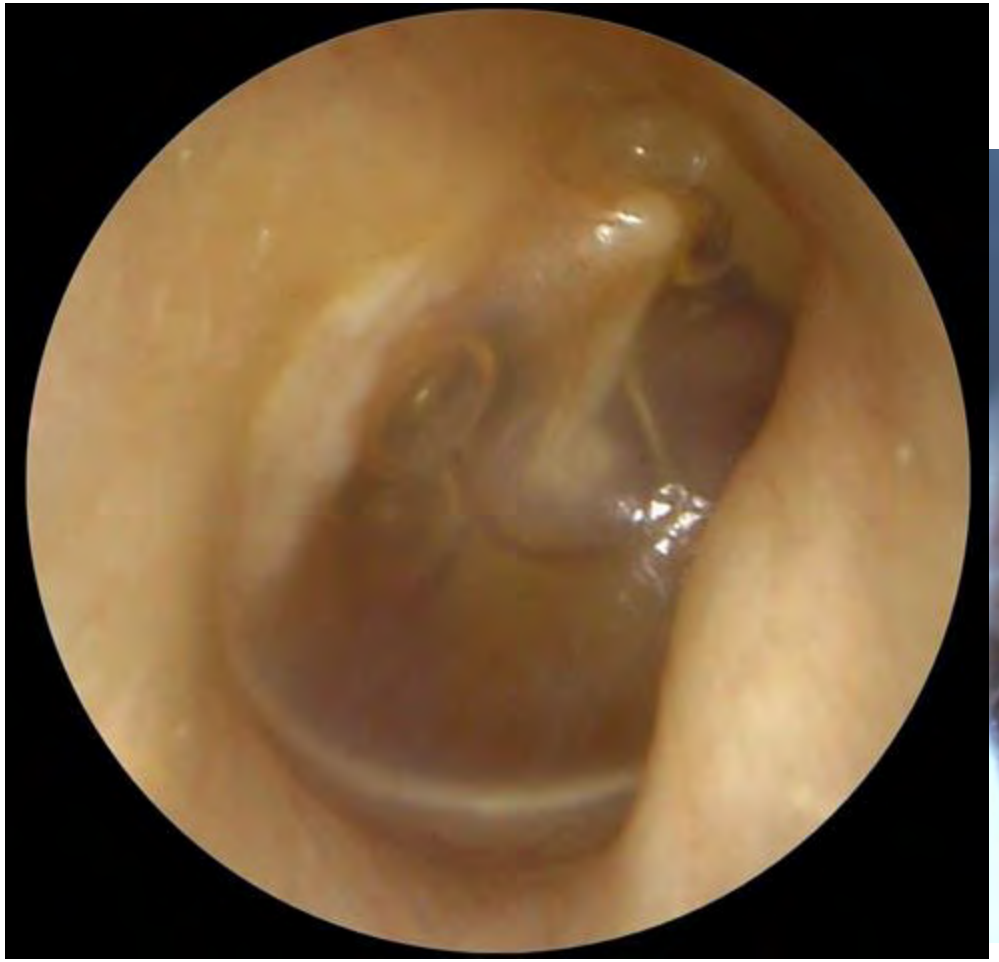
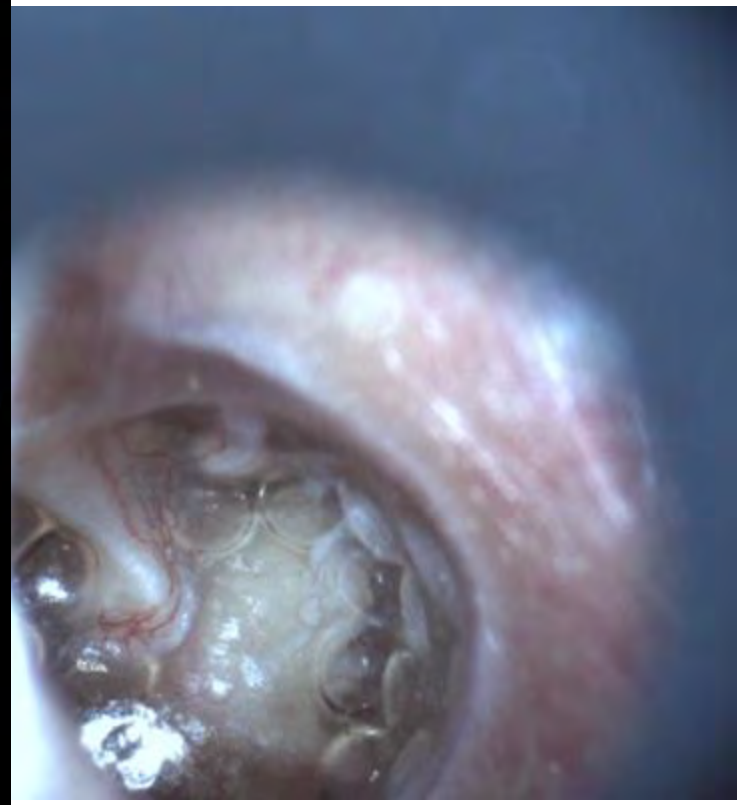
Serous OME

- Fluid, but not infected
  - Serum: amber coloured
  - Sometimes bubbles
  - No pain
  - Hearing down

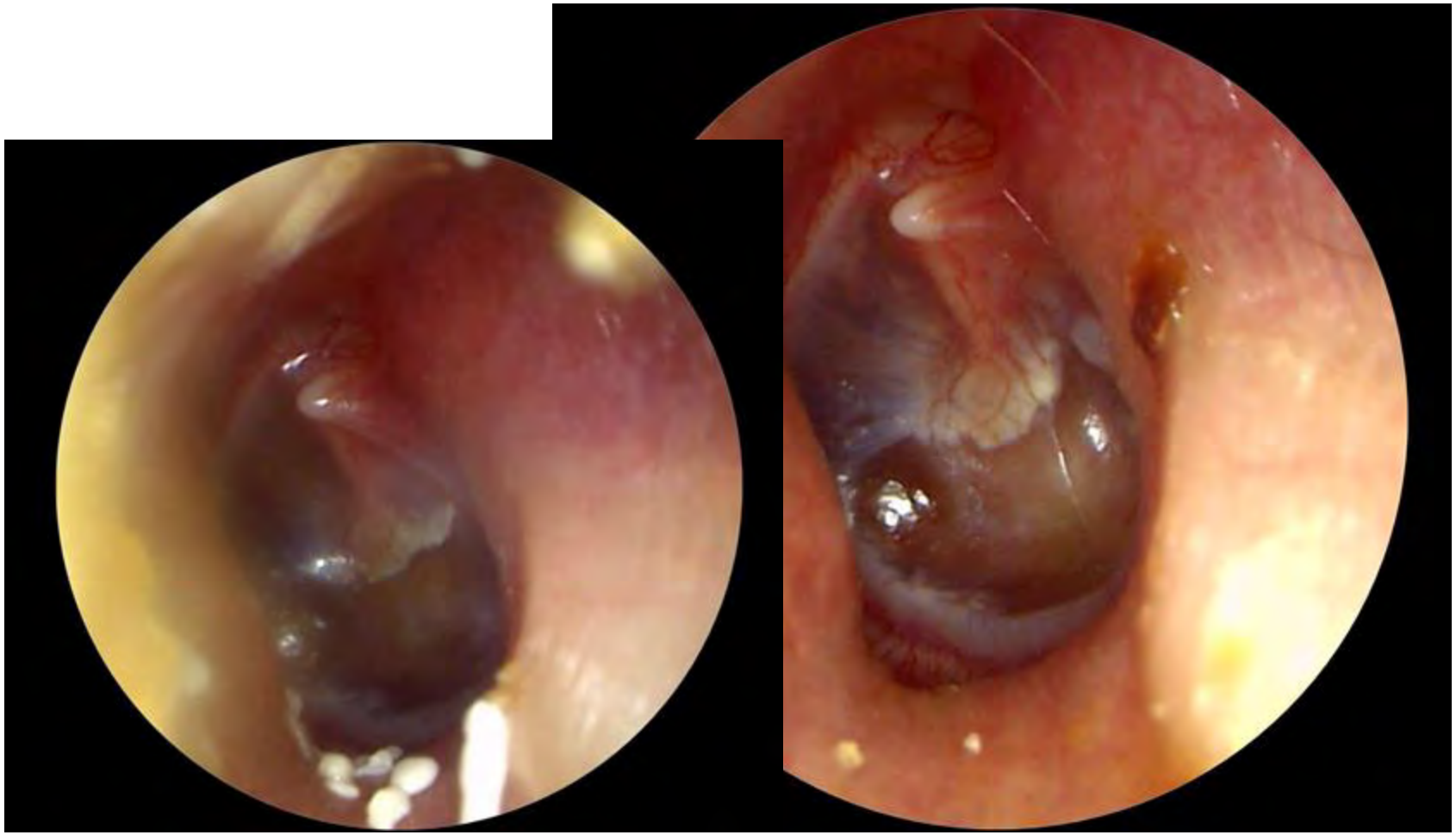




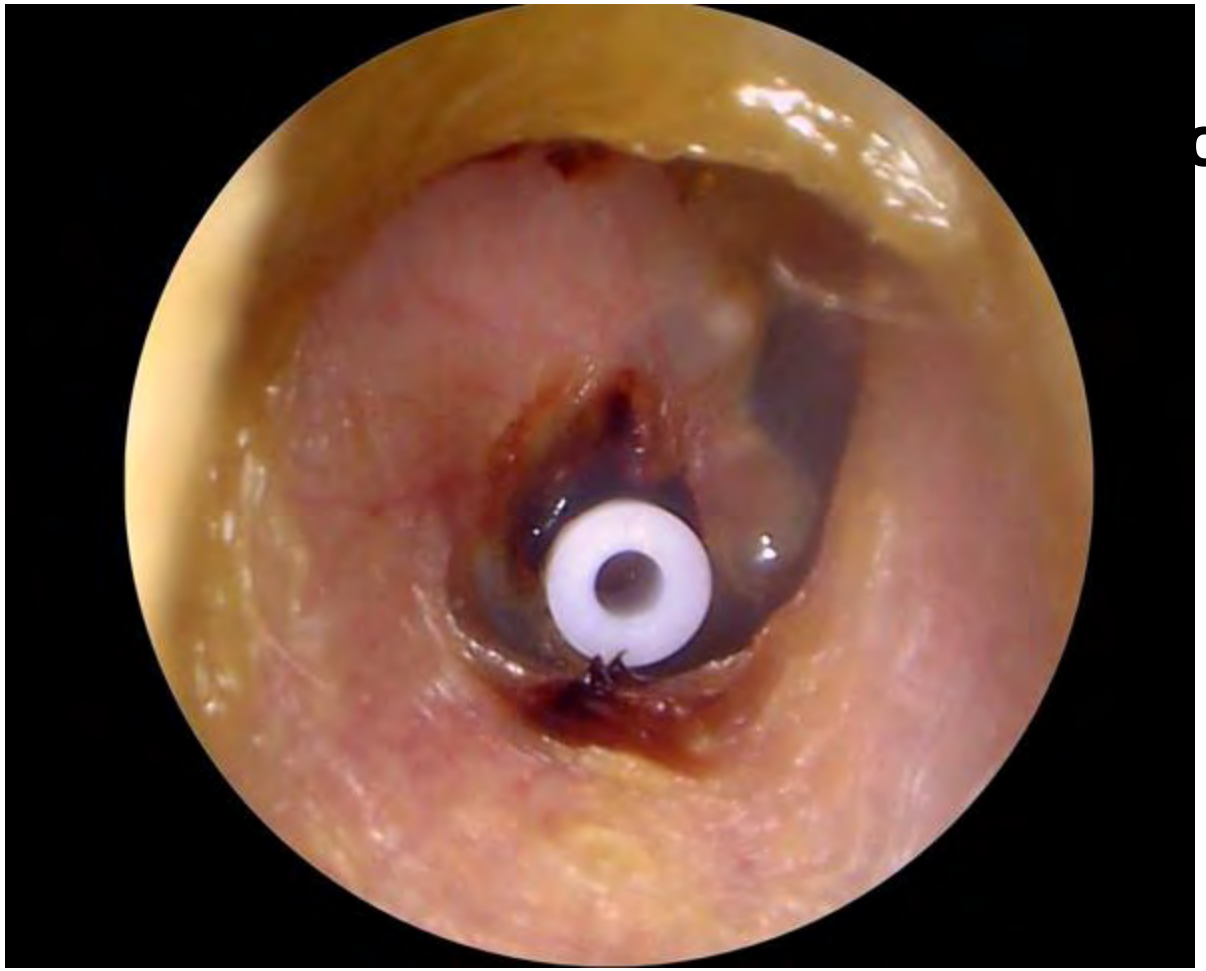
Middle Ear Issues

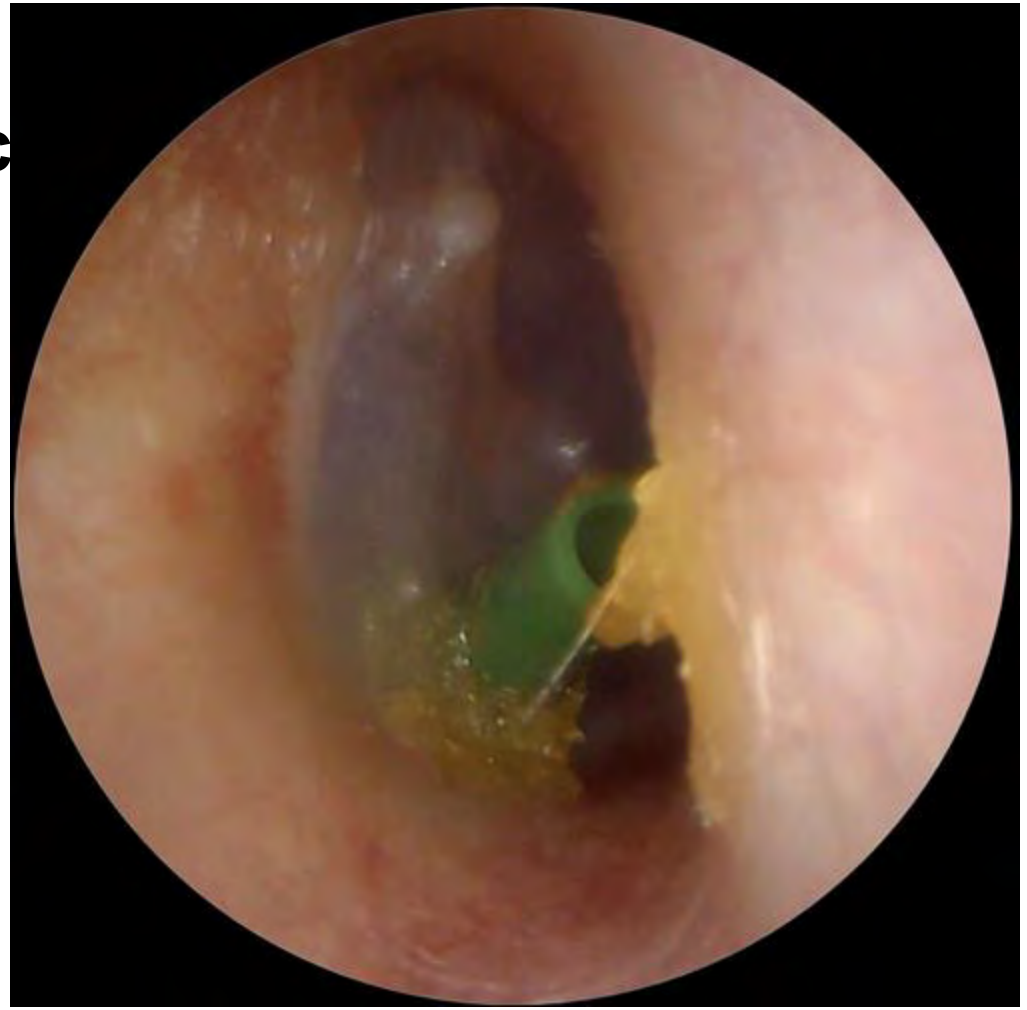
Fluid in the Middle Ear

- image on right is after PE tube had worked its way out



PE





PE

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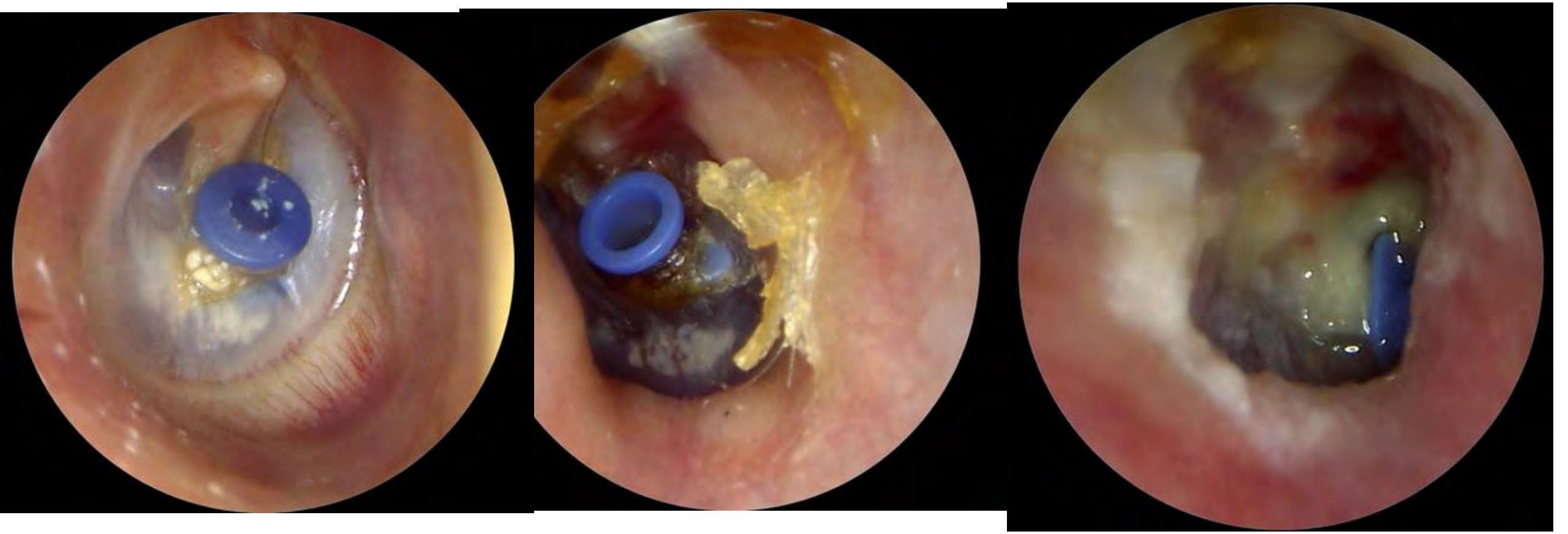
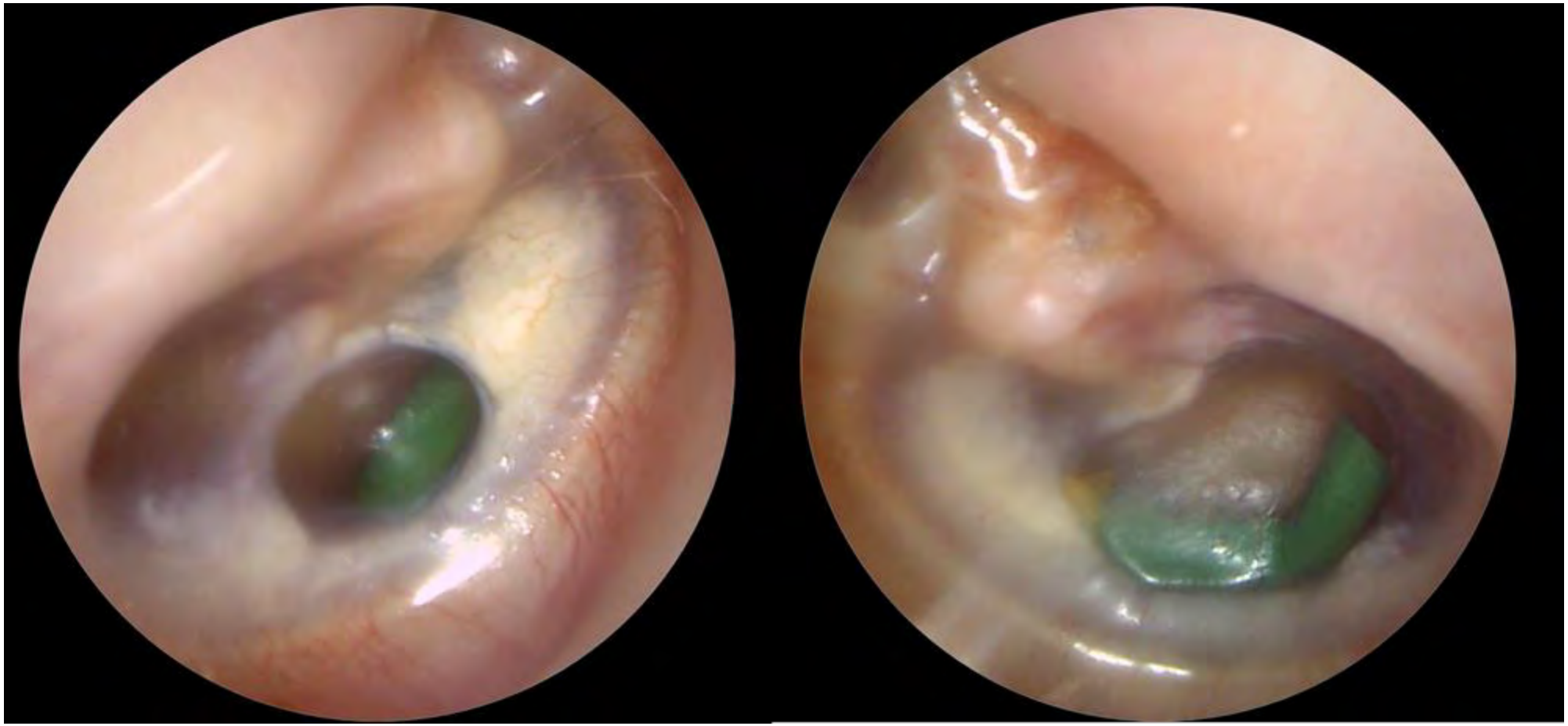
PE tube on right image is not doing so well!



PE Tubes

Gone Wrong

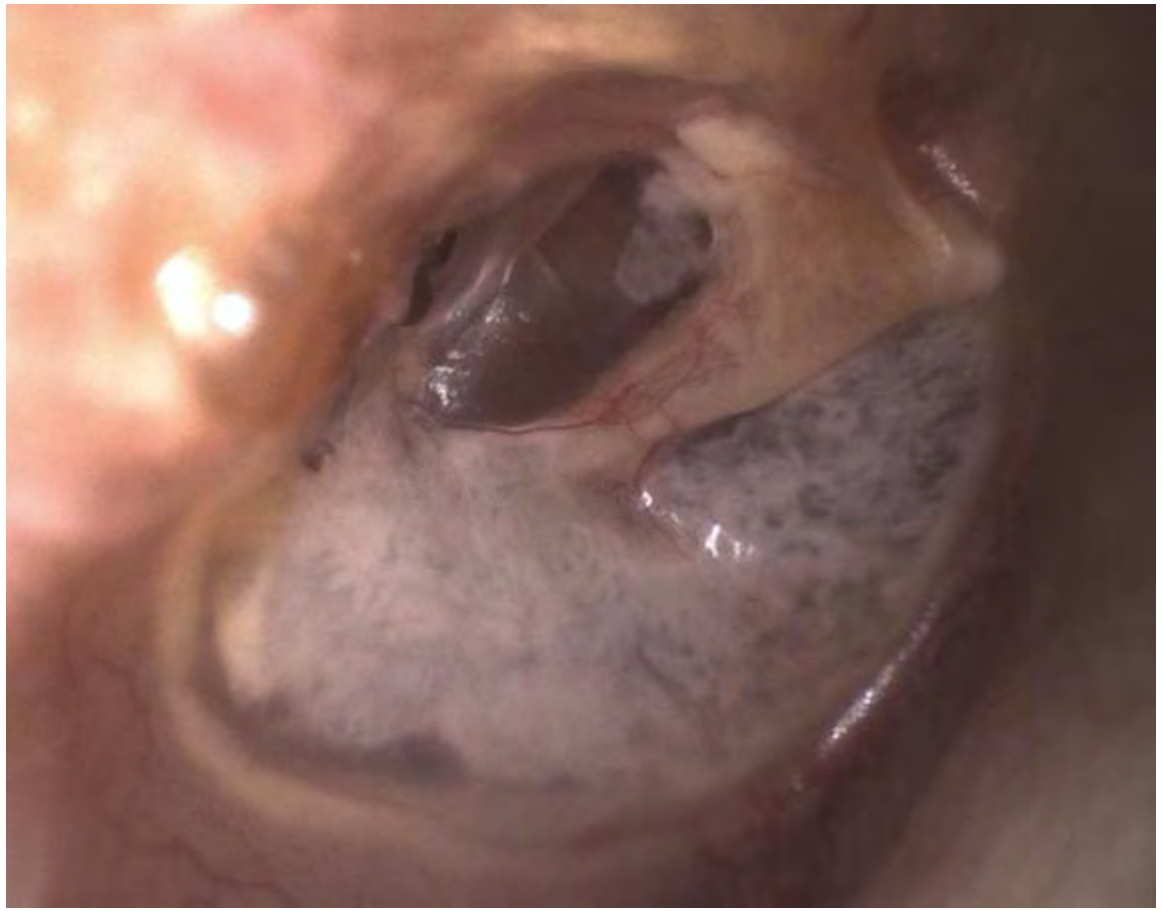
- Sucked into ME spa ce!



Perforations

Right ear small sized perforation

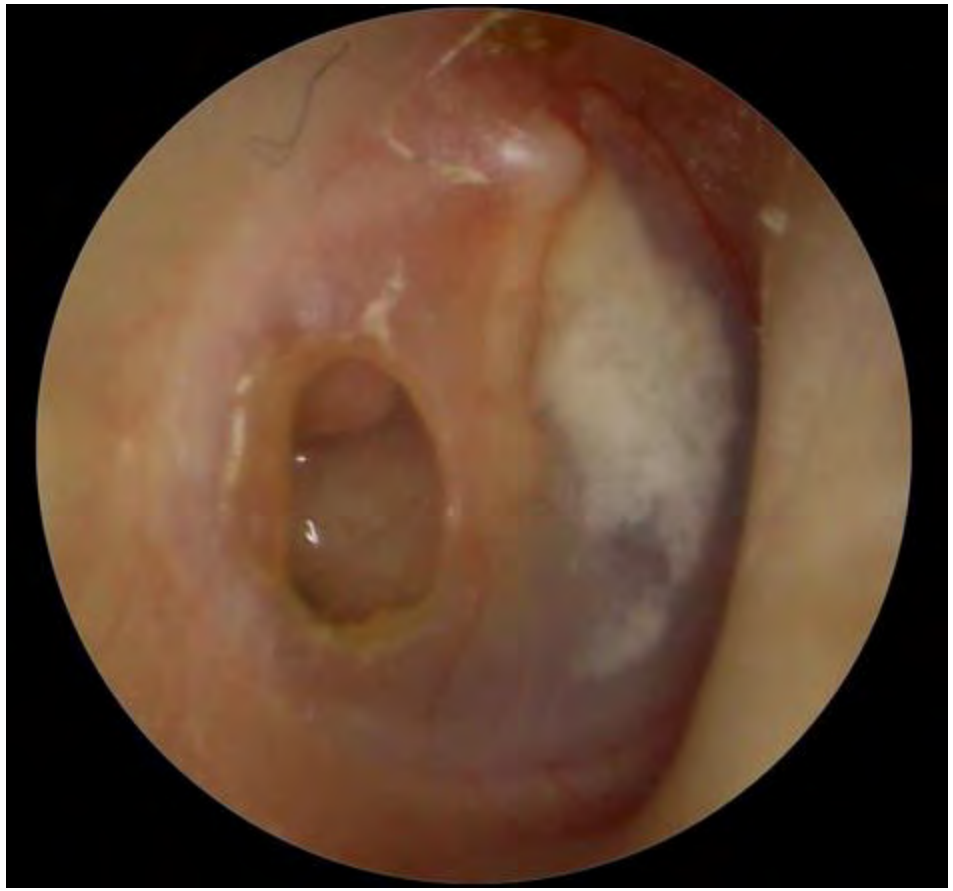
- Perf is in posterior-superior quadrant
- Ongoing middle ear issues
- Longstanding perforation
    - Flat tymp with large volume



Perforations

Right ear medium sized perforation

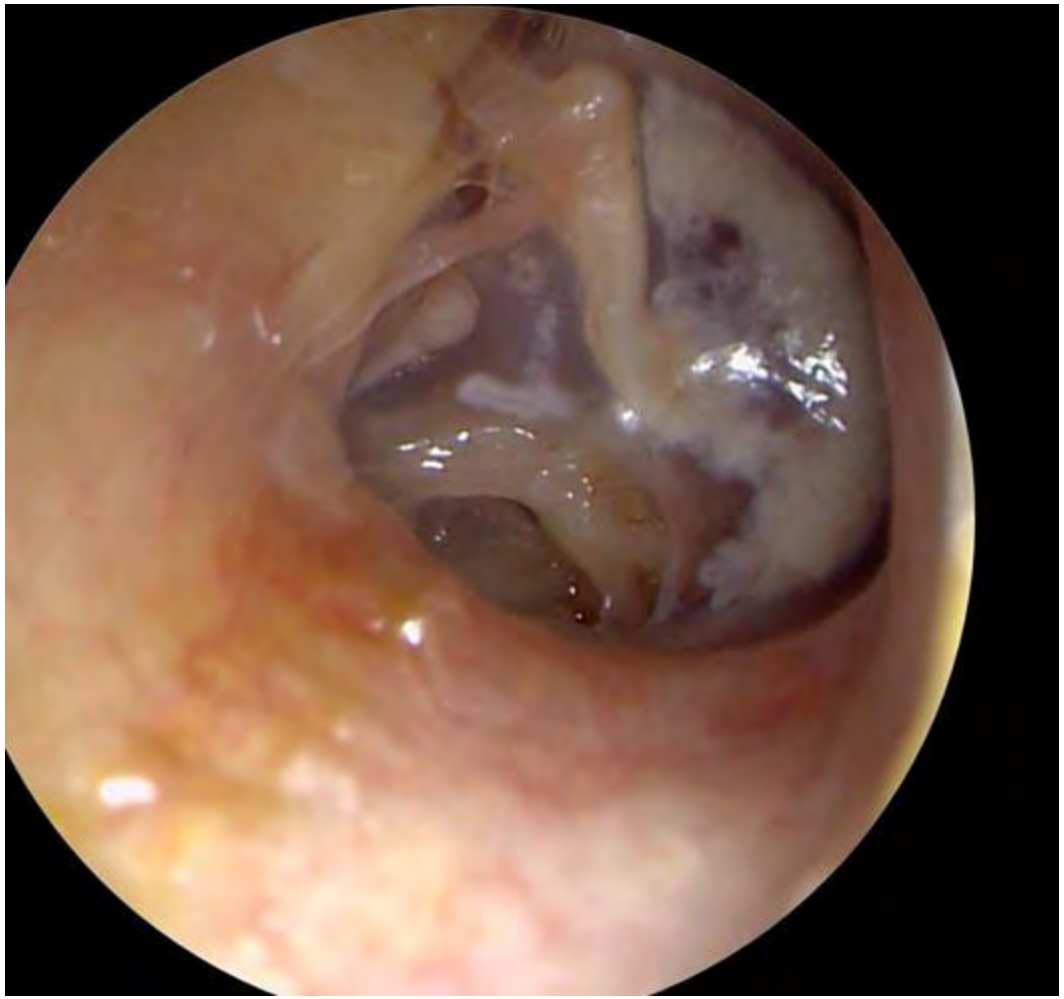
- Posterior aspect



Perforations

Right ear perforation with severe retraction

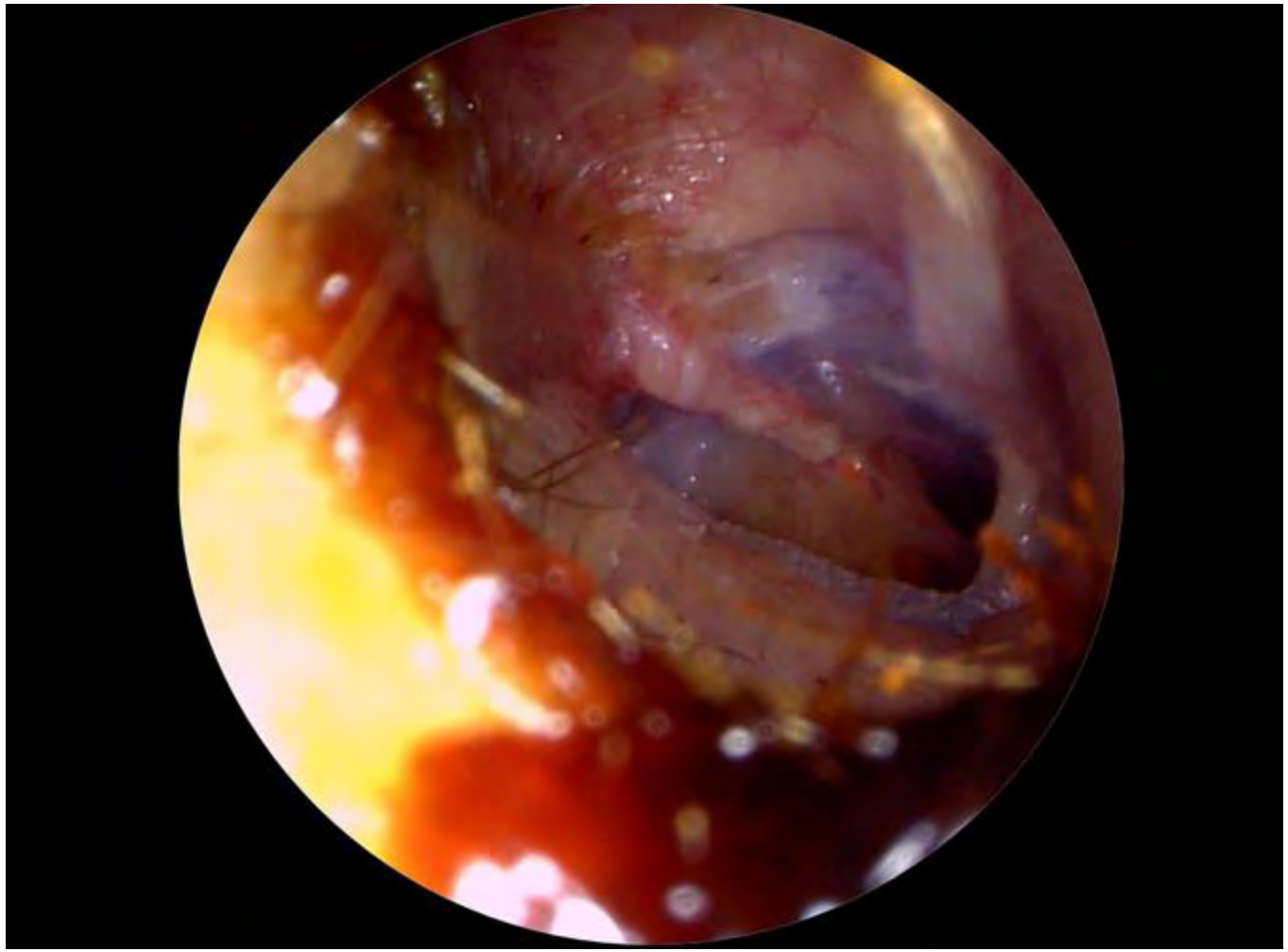
- Posterior-inferior quadrant



Perforations

Large perforation

- Reportedly due to Q-tip use



Perforations

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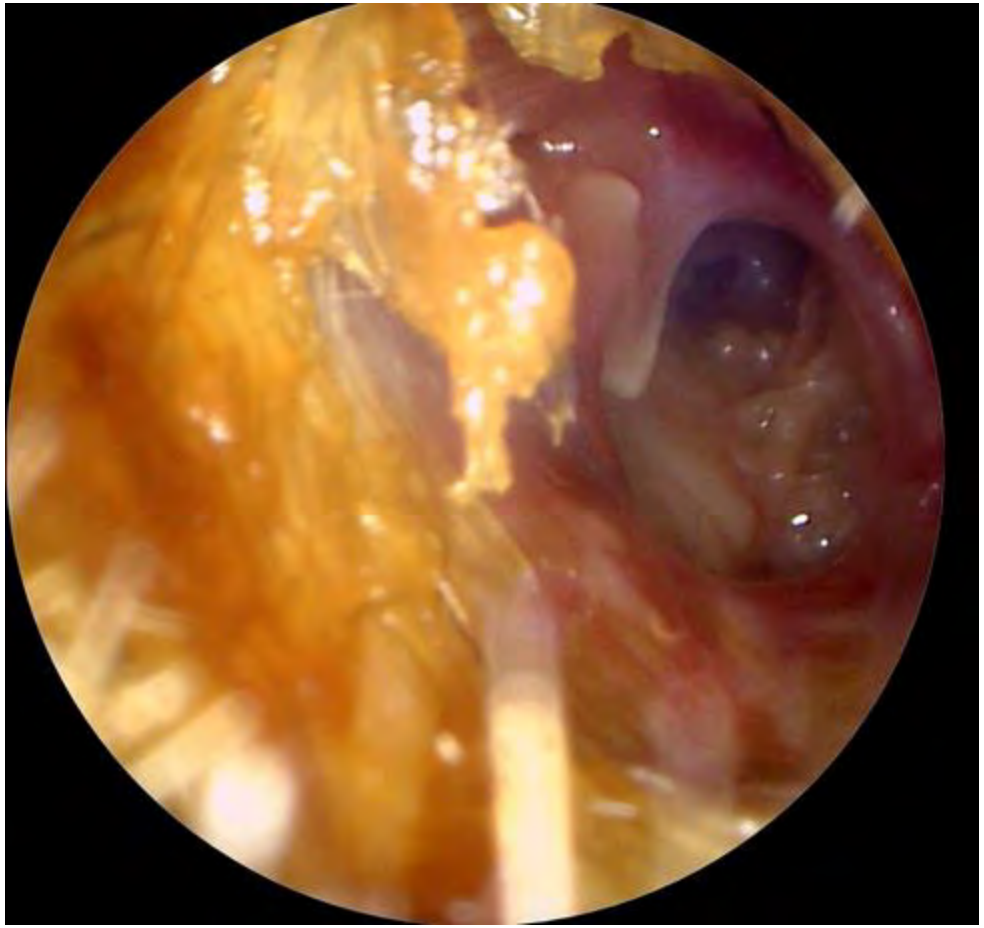
Right ear full perforation

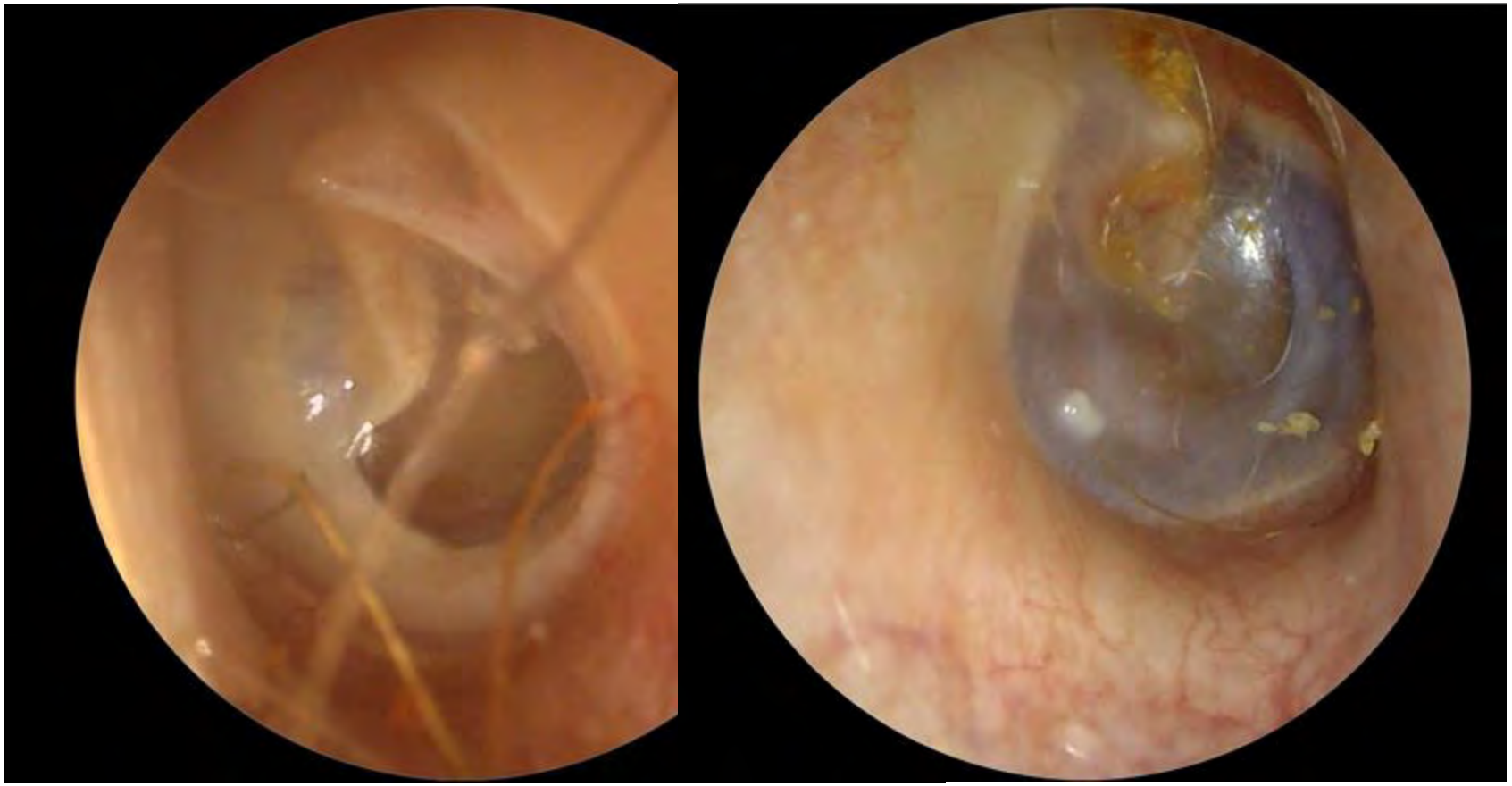
- Middle ear space is open



Monomeric TM

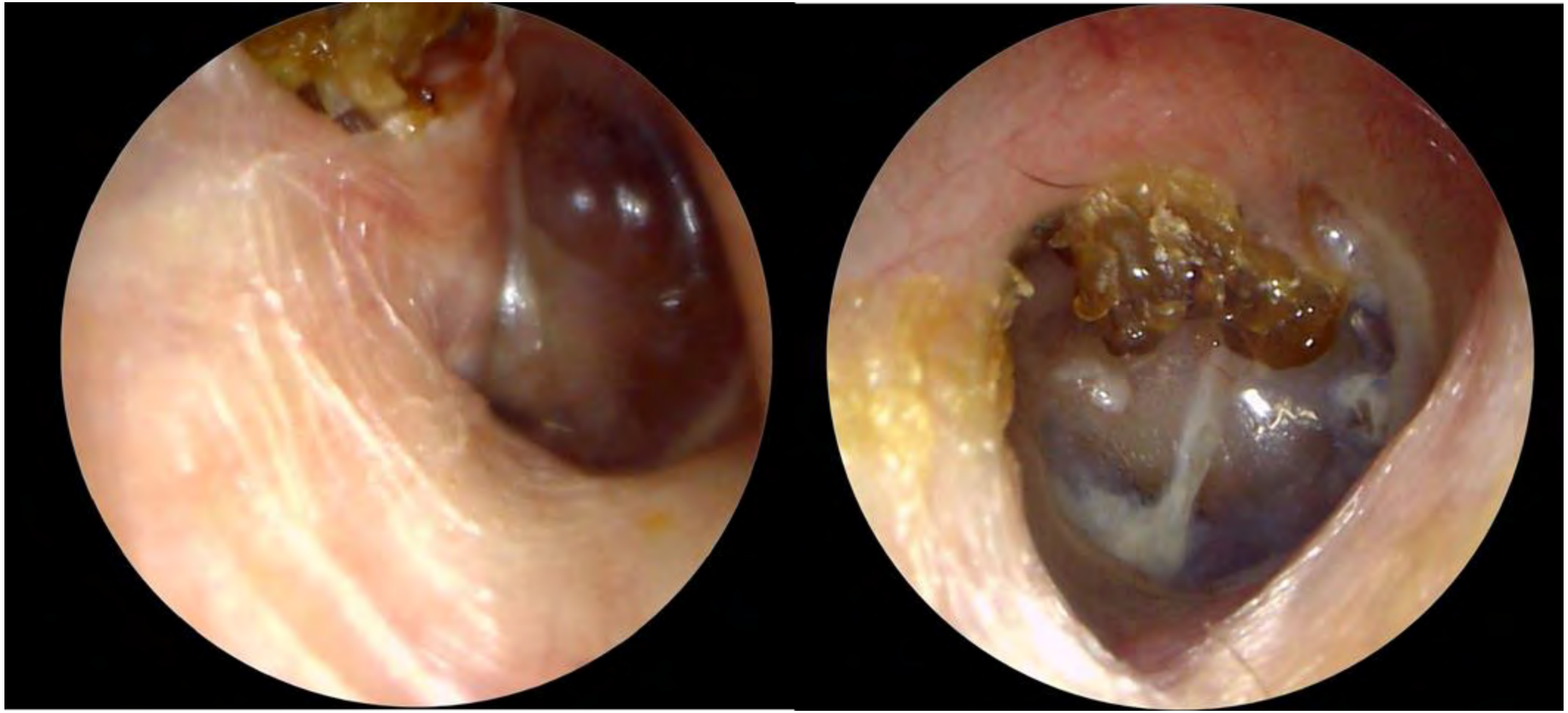
Healed perforations

- We see lots of these



Cholesteatomas

Cholesteatoma - Right ears



Surgical Ears

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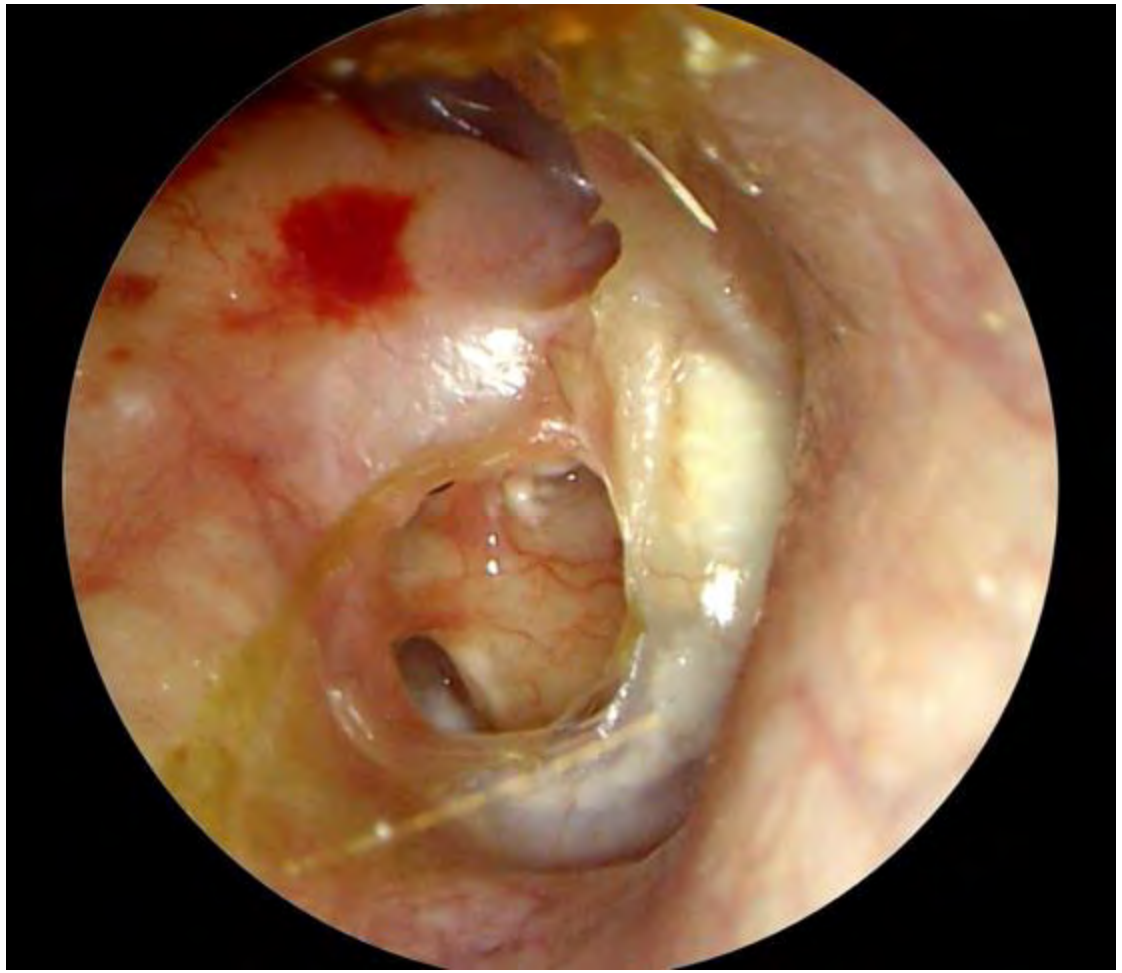
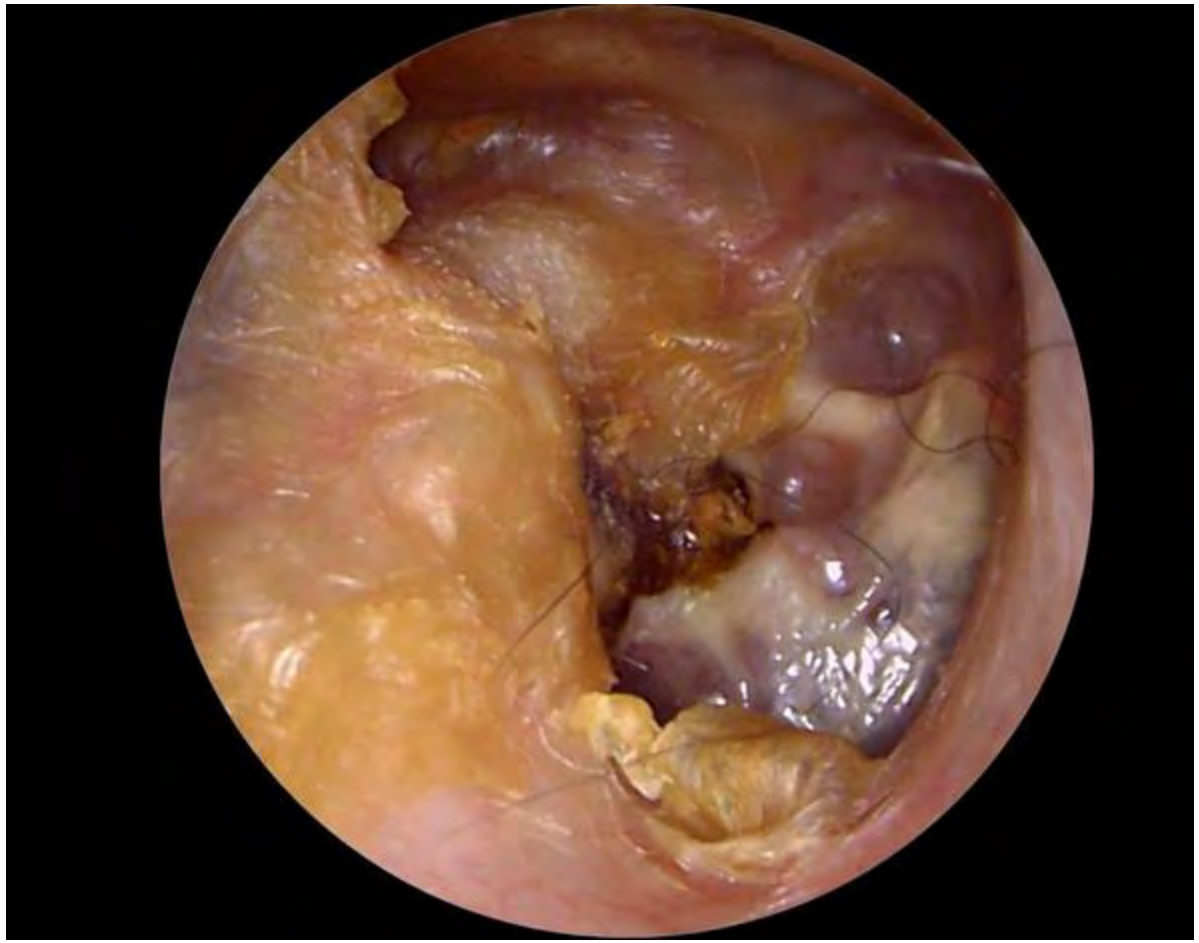
Right Ear Double Mastoidectomy with large perforation



Surgical Ears

Right ear Mastoidectomy-tympanoplasty



Surgical Ears

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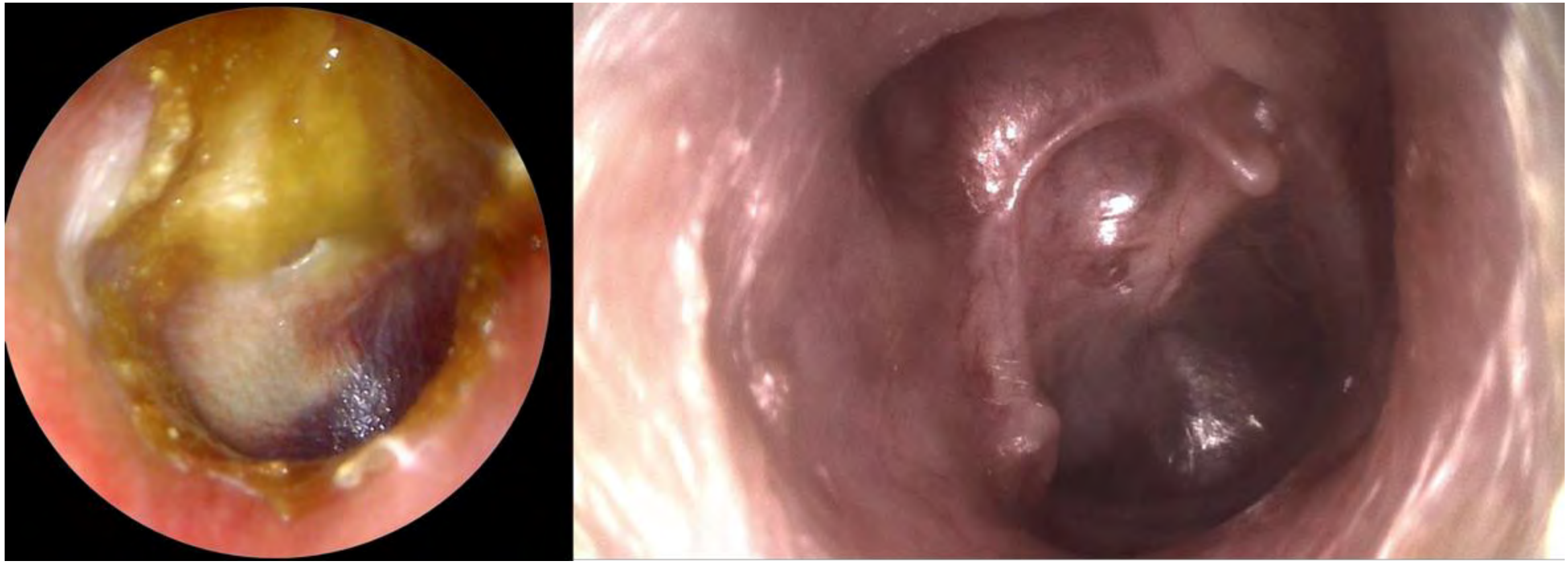
Pre and post surgery - right ear

- Pre: Natus Otocam Post: Inventis Harmonica



Summary

- Video otoscopy is essential to having a modern hearing clinic
  - It should be used with every patient, in my opinion
- VO makes your clinic more professional, less liable, and just makes clinical sense: diagnostics, documentation; it is also inclusive and patient-oriented
- While there are many styles and models of video otoscopes out there…
  - The gold standard are devices that are extremely high-quality, easy to use, USB powered and NOAH compatible
- Start using VO with every patient and change how you practice forever …and start creating your own VO image library!

Thank you for your attention.

QUESTIONS?

Contact: clayton@treatyourhearing.ca

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