Ear wax, why is it there? When and how to remove it

Mike Smith
ENT Consultant
Hereford County Hospital
and
Worcester Royal Infirmary

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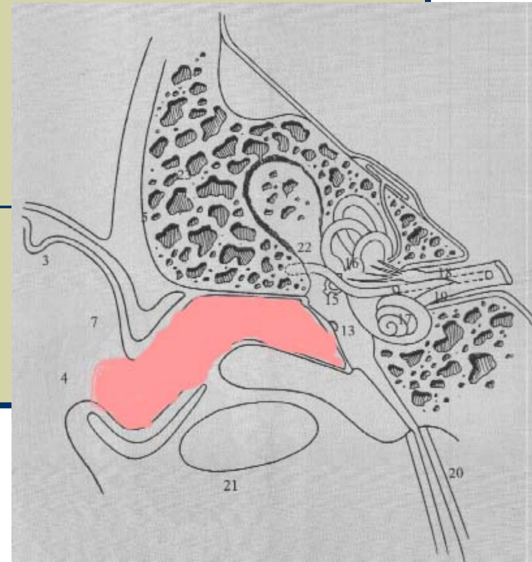
Anatomy:
Ear Canal: 2-3cm long (2.7 avg.)

	Cartilaginous part	Bony part
	Outer 1/3 of canal	Inner 2/3 of canal
Skin	Thick, 1.5-2mm	Thin, 0.1-0.15 mm
Glands	1. Cerumen 2. Sebum	None
Hair	1. Fine 2. Thick (older men)	None

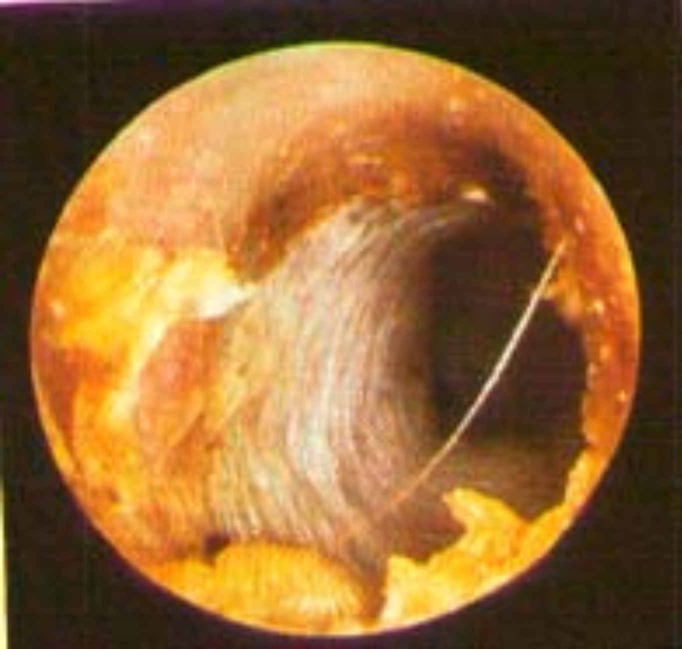


Ear Canal Glands and Wax

- **Cerumen**
  Long coiled tubes with muscle walls.
  In hair follicles.
  Secrete like sweat in response to e.g emotions like fear.
  Thin sweat like secretion.
- **Sebum**
  Secrete Oily fluid.
  In hair follicles.
- **Epithelium**
  Migrated from deep canal and from drum surface.
- **Hairs**
  Shed and matting with secretions.

Functions of wax

- Waterproofing layer
- Protective layer from trauma
- Migration outward with dust, foreign material (e.g.sand, grommets)
- pH is antiseptic
- Contains antibacterial agents



Canal Skin Migration

- Epithelium Keratin/ dead skin moves from drum centre out and along canal to meet the secretions in outer canal

- Wax formation: Mixed cerumen, sebum, epithelial debris and loose hairs

- **Keratosis Obturans** Failure of migration. Epithelial build up and canal expansion. Rare.

Remedies and folklore

- Historical
  Ancient Egypt
  - syringing with olive oil, frankincense, salt
  Also reported goat's
  - urine, steam
- Wax spoons
- Ear 'candling'
- Harmful practices:
  Scratching
  Cotton buds
- False conceptions:
  Wax is dirty in some way
  Wax is often the cause for reduced hearing

Problems with wax?

- **Hearing loss**
  Totally obstructed e.g. wax and water (conductive hearing loss 45dB)
  Apparent total obstruction (hearing loss 5dB)
  Non-obstructive (no loss)
- **Tinnitus**
  Crackling due to contact of wax in canal with drum
  Associated with hearing loss of canal obstruction
- **Pain, Otitis Externa**
- **Hearing aid obstruction**

- Solvent drops
- Syringe
- Aural speculum and loops/hooks
- Microscopic suction

Wax Solvent Drops

Bicarbonate
Olive oil
Glycerine
Commercial e.g. Cerumol, Waxsol, Exterol (5% urea / peroxide in glycerol)

Ear Syringing

- Types of syringe
  Metal, traditional
  Plastic
  Rubber bulb/rat-tail
  Electrical pulsed
  pump

- **Method** (training?)
  Solvent for 1/52 beforehand
  Straighten canal
  (Pull up and back)
  Water at 37-38 deg. C
  Smooth action syringe
  Brace nozzle with hand on head, against sudden movement
  Plastic drape on patient
  Point syringe up and back
- **After syringing**
  check canal/drum (Dr?)

Survey of GP practice
BMJ Sharp et al. 1990

- 312 GPs,
  (289 responders)
- 274 do syringe
  (20% always do it themselves)
- 44,000 ears syringed in period of study (9 pts. per GP per month)
- Even when wax appeared to be obstructive; mean hearing gain was only 5dB.

Risks of syringing

- A New Zealand Med Insurance group reported 25% of claims arise from ear syringing.
- Complications requiring specialist referral in 1:1000

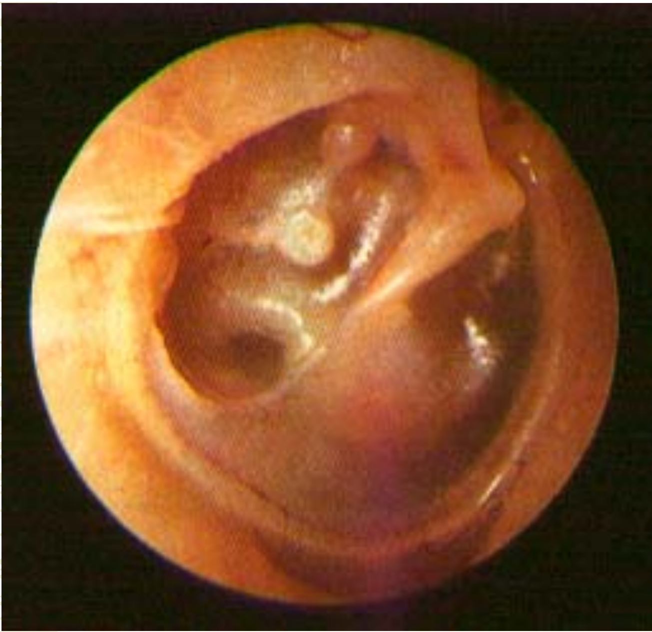
Indications for syringing

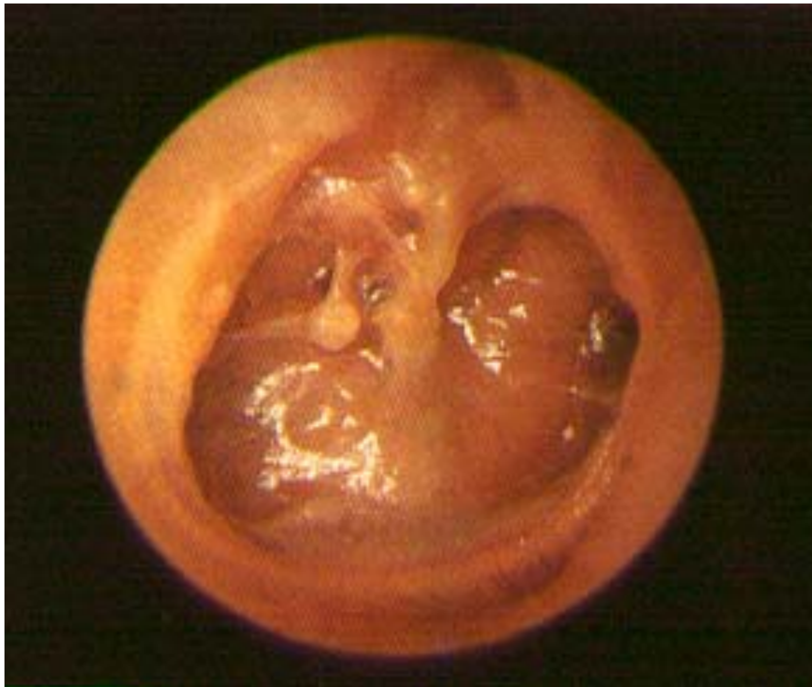
- Total occlusion
- Pain / discomfort
- Examination of obscured tympanic membrane
- Tinnitus (but may aggravate)
- Otitis Externa (if other cleansing not available)
- Foreign body

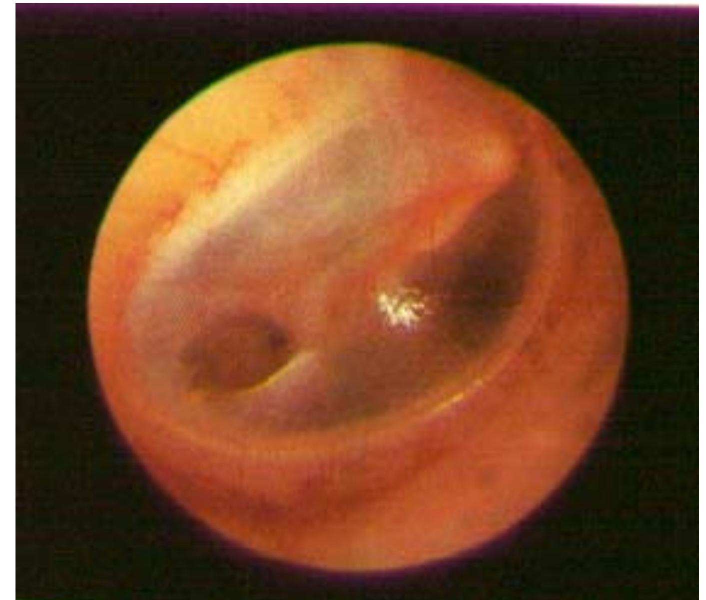
Contra-indications to syringing

- Non-occlusive wax (be more selective of patients)
- Previous ear disease with atrophic thin drum
- Previous ear surgery (even grommets can leave thin segments of drum)
- Awaiting ear surgery (can precipitate mastoiditis)
- Perforation (may force debris into middle ear or re-infect the perforation)
- Only hearing ear (take no risks)
- Past history of recurrent Otitis Externa
- *Extra care* to avoid trauma if taking anti-coagulant

Atrophic drums



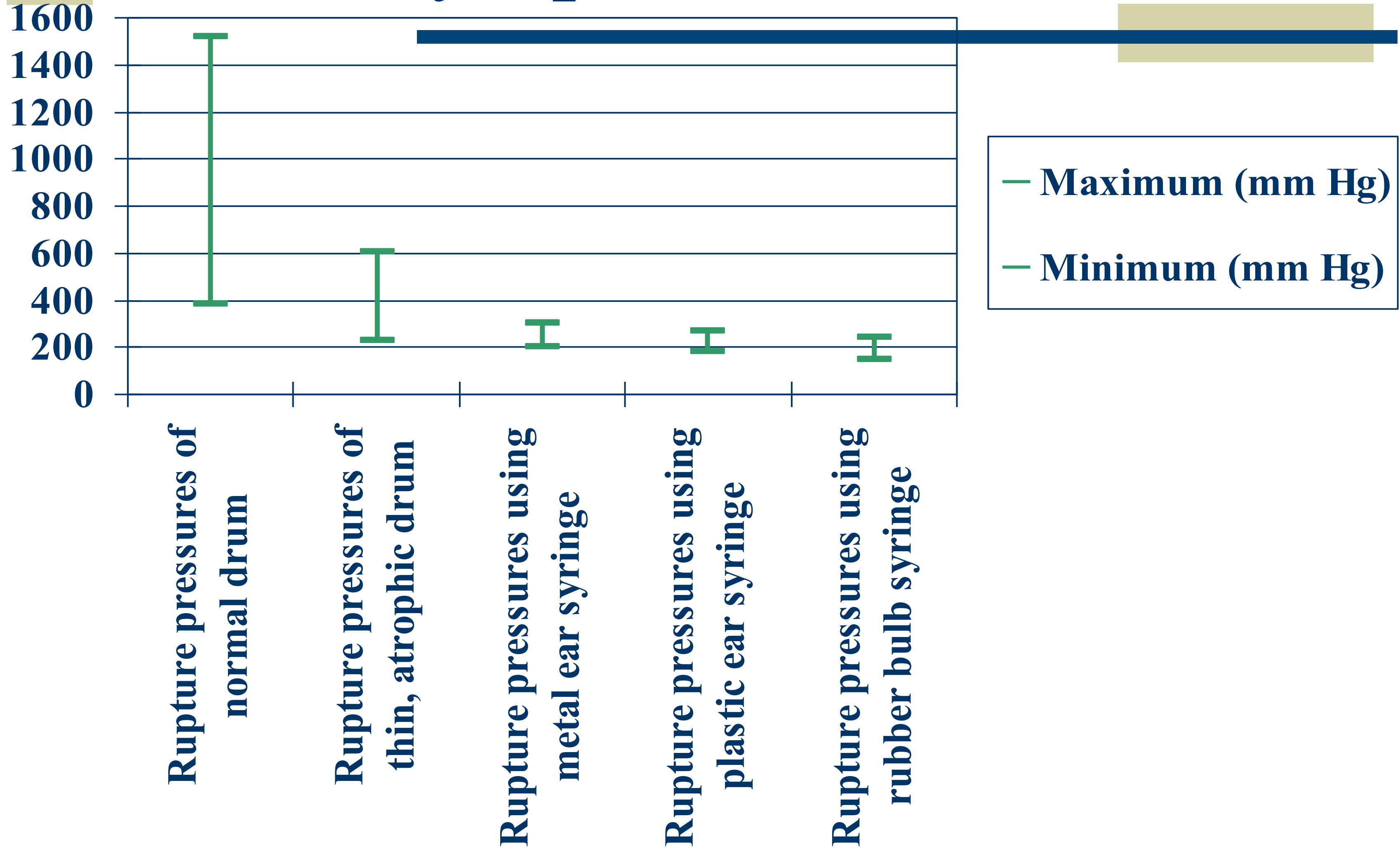




Rupture of human ear drum by syringing
Study by Sorenson et al 1995

- 10-48 hr cadavers
- Measured ear canal pressures
- Large variations in rupture pressure, but well above that generated by syringing (if TM not atrophic)
- Least risk:
  Young
  Narrow canal
  No atrophic sections of TM
- Higher risk:
  Older
  Wide canal
  Straight canal
  Thin TM

Experimental rupture pressures of Tympanic membrane

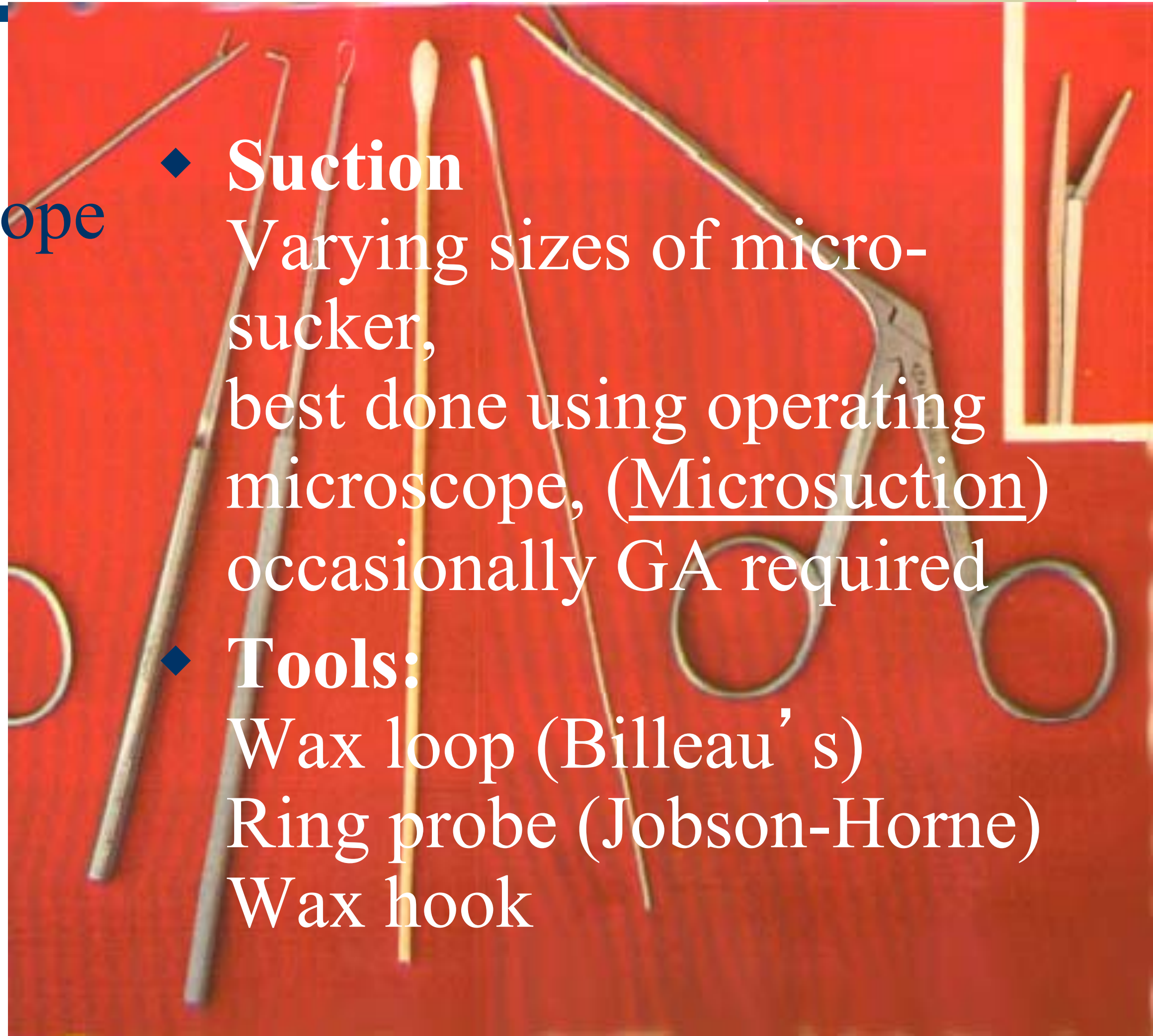


Treatment of complications

- **Otitis externa**
  prompt treatment
  refer if canal occluded by debris or oedema
- **Perforation**
  specialist referral
  (it usually heals)
- **Canal wall bleeding**
  bicarbonate or a/b drops stat
  follow up to ensure clot clears
- Acute sensori-neural hearing loss or vertigo
  Urgent referral
- Refer early if in any doubt.
  Do not blindly reassure the patient, check

Removal of wax with instruments

- **Lighting:**
  Open head otoscope
  Headlight
  Ear Microscope
- **Speculum**
  On otoscope or handheld



- **Suction**
  Varying sizes of micro-sucker,
  best done using operating microscope, (Microsuction)
  occasionally GA required
- **Tools:**
  Wax loop (Billeau's)
  Ring probe (Jobson-Horne)
  Wax hook