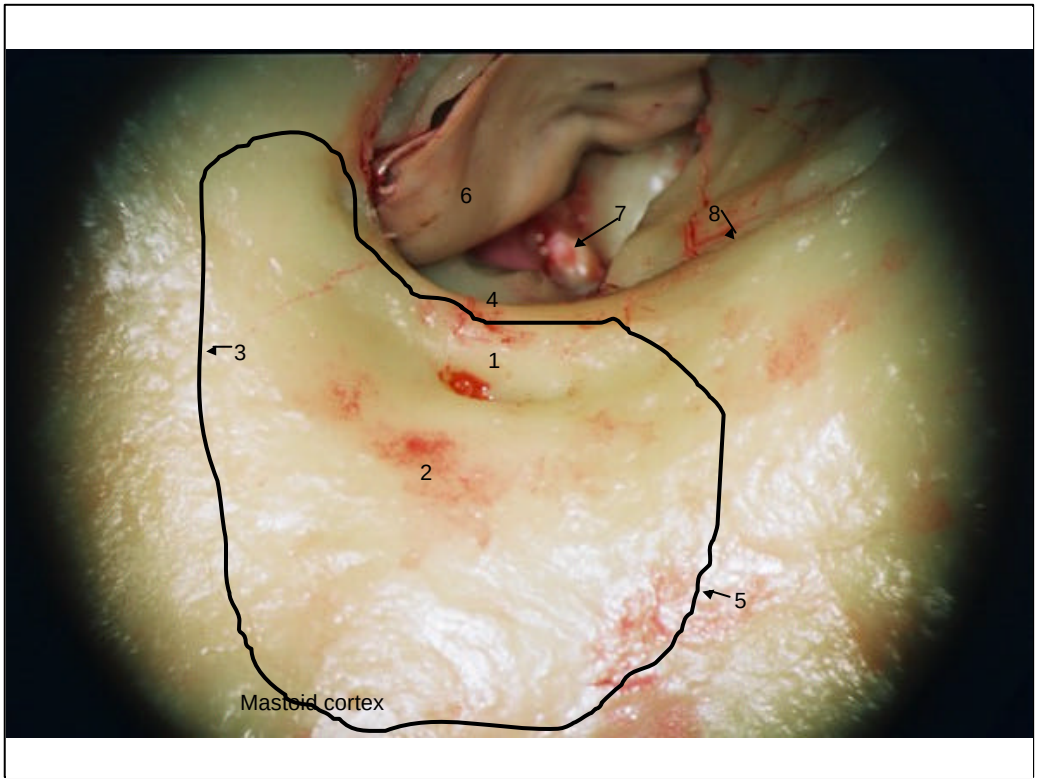
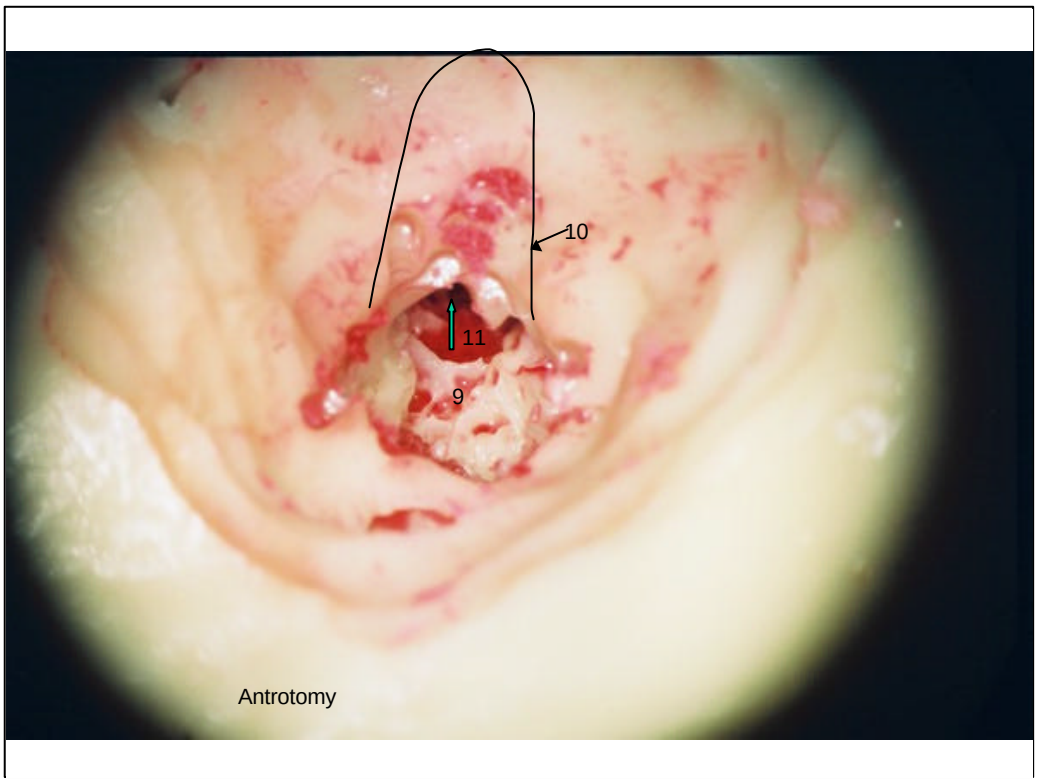
Cortical mastoidectomy



1 Spine of Henle. **2** Cribriform area. **3** Temporal line. **4** Postero superior wall of EAC. **5** Area to be drilled. **6** Tympanomeatal flap. **7** Head of stapes. **8** Tympanomastoid suture.

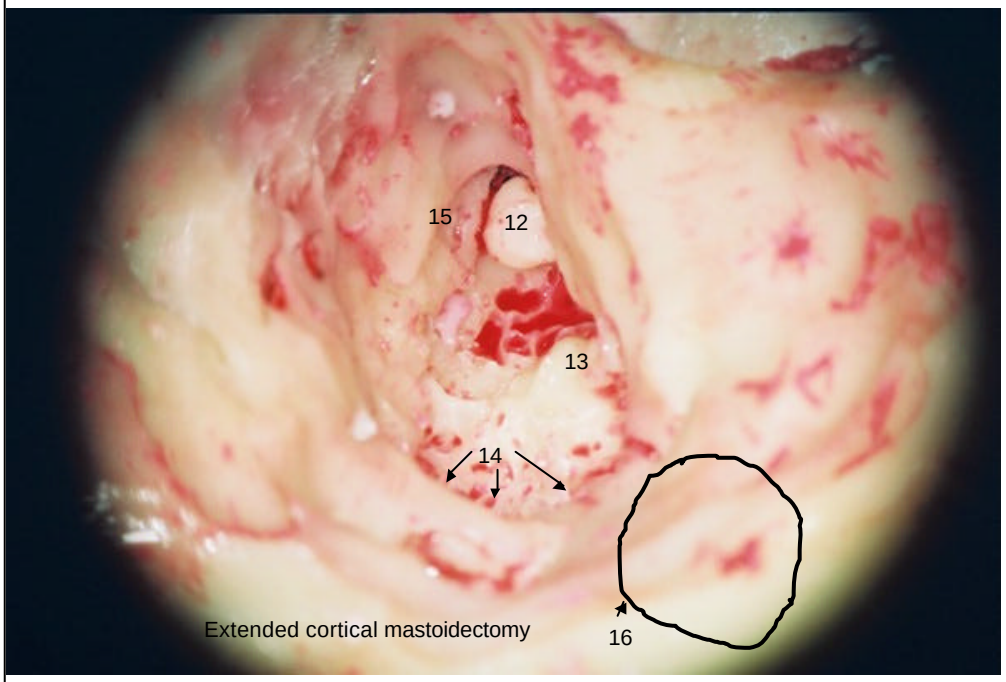
Cortical Mastoidectomy

The aim of this procedure is to remove mastoid air cells and define the limits of pneumatisation. One of the characteristics of the temporal bone is its variability and this is especially so with pneumatisation. However, the antrum is always present and at the same site and so provides a secure landmark no matter how sclerotic or pneumatised the bone.



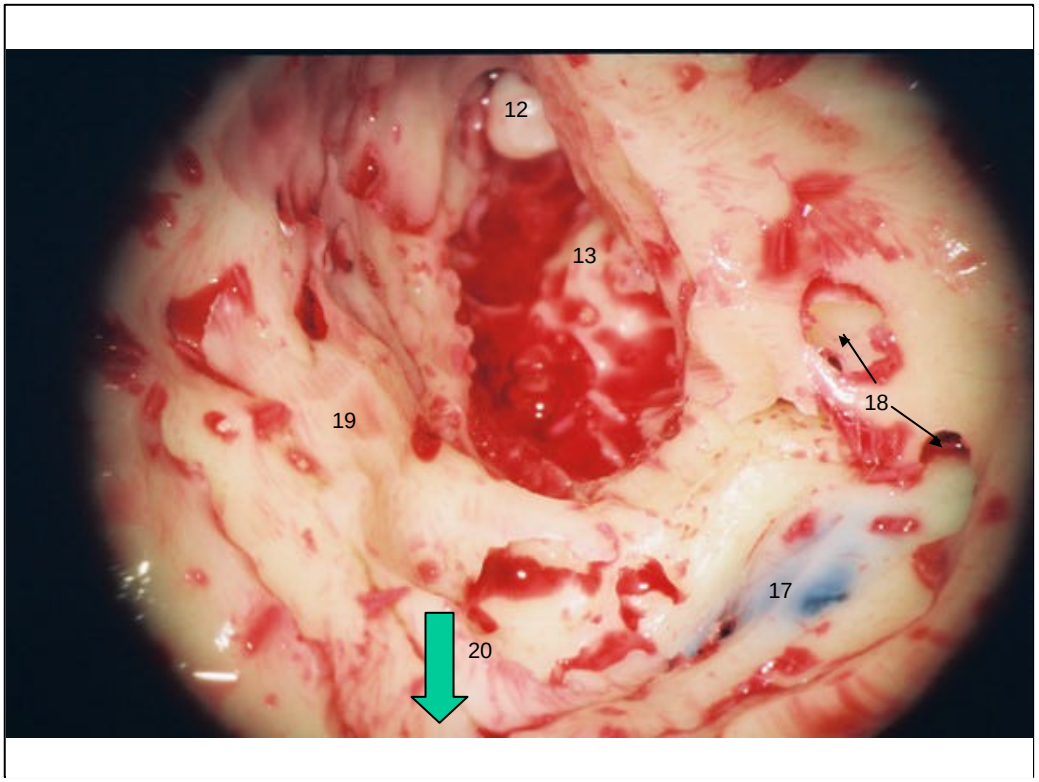
9 antrum. **10** bone removal to get view of head of malleus. **11** arrow points to epitympanum.

Begin posterosuperior to the EAC using a 5.5mm bur. Keep the wall of the EAC intact and drill in an anteromedial direction parallel to the EAC. Keep the walls of the cavity sloping so that you can see the point of your instrument as you progress medially. Beginners tend to drill down a narrow pit with vertical walls preventing a view of the business end of their instrument. Always be alert for the sigmoid sinus. The antrum is the same distance medially as the TM so keep the EAC clear of bone dust otherwise you will lose this landmark. Once into the antrum drill anteriorly with 2mm bur to get a view of the epitympanum and head of malleus (incus has previously been removed).



12 Head of malleus. **13** Lateral semicircular canal. **14** Periantral cells. **15** Tegment tympani. **16** Bone to be removed to view sigmoid sinus.

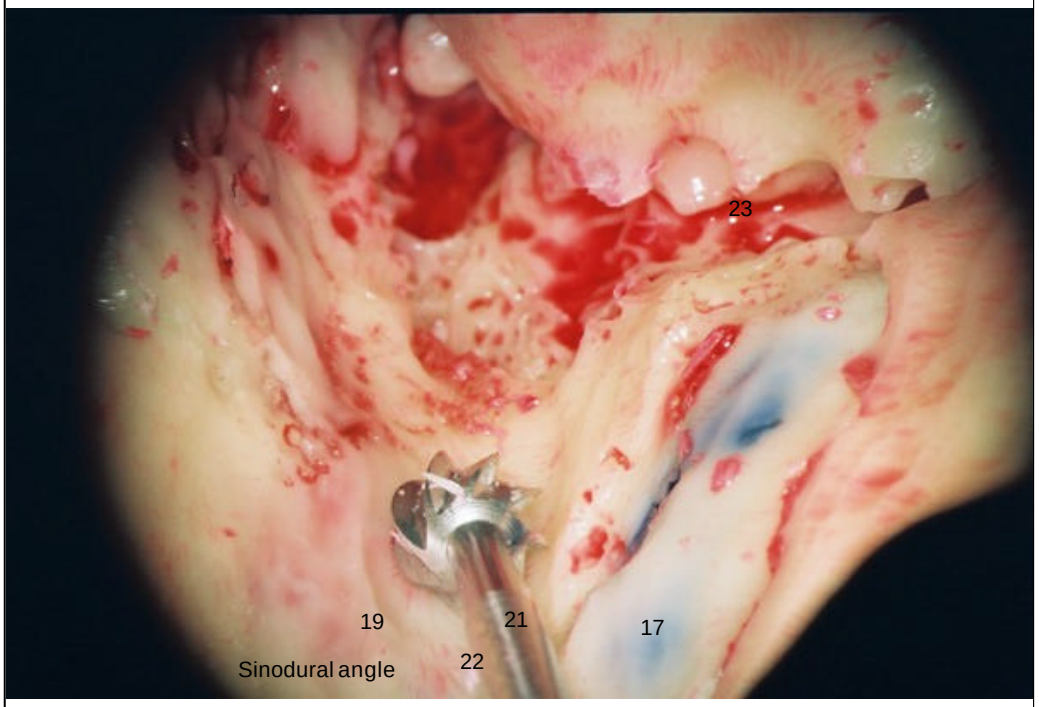
Now drill posteriorly to expose the sigmoid sinus.



17 Sigmoid sinus. **18** Mastoid air cells. **19** Middle fossa plate (dura).

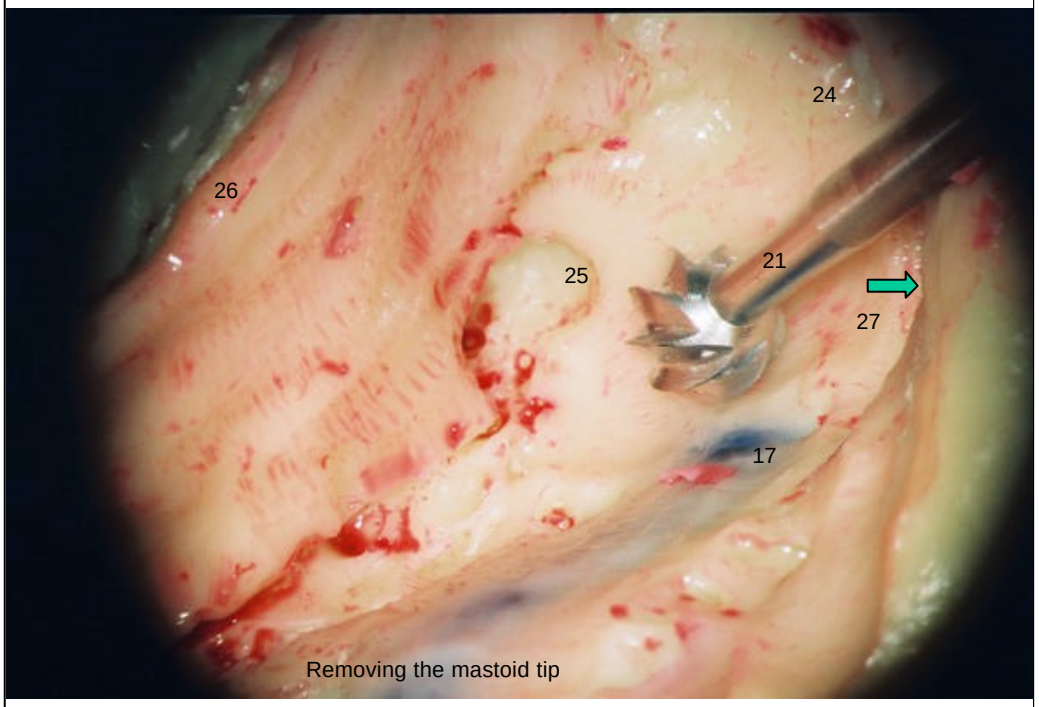
20 Arrow points to sinodural angle (Citelli's angle).

Now remove the cells between the middle fossa plate and the sigmoid sinus to identify the sinodural angle.



19 Middle fossa plate. **21** 5mm bur. **22** Sinodural angle. **23** Central mastoid tract

Drill out the cells between the pink of the middle fossa plate and the blue of the sigmoid sinus. Do not leave any unopened cells here that may in a patient contain cholesteatoma.

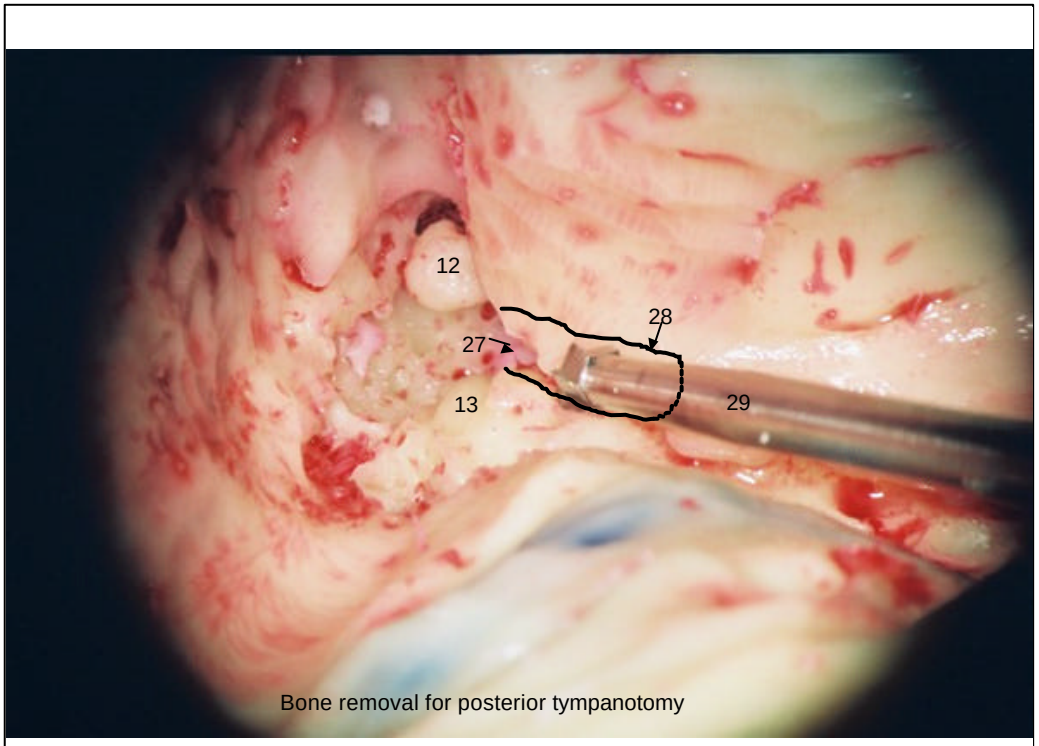


Removing the mastoid tip

17 Sigmoid sinus inferiorly. **21** 5mm bur. **24** Mastoid tip. **25** Opened mastoid air cell. **26** Intact posterior wall of the external auditory canal. **27** Arrow points to a yet unopened cell.

Remove all the cells from the mastoid tip and the cortical bone of the mastoid tip itself. If an extensive cholesteatoma should extend this far inferiorly you need to remove all these cells. Removal of the tip allows soft tissue to collapse into the tip area, obliterating what would otherwise be a sump where wax and keratin could collect.

Posterior tympanotomy

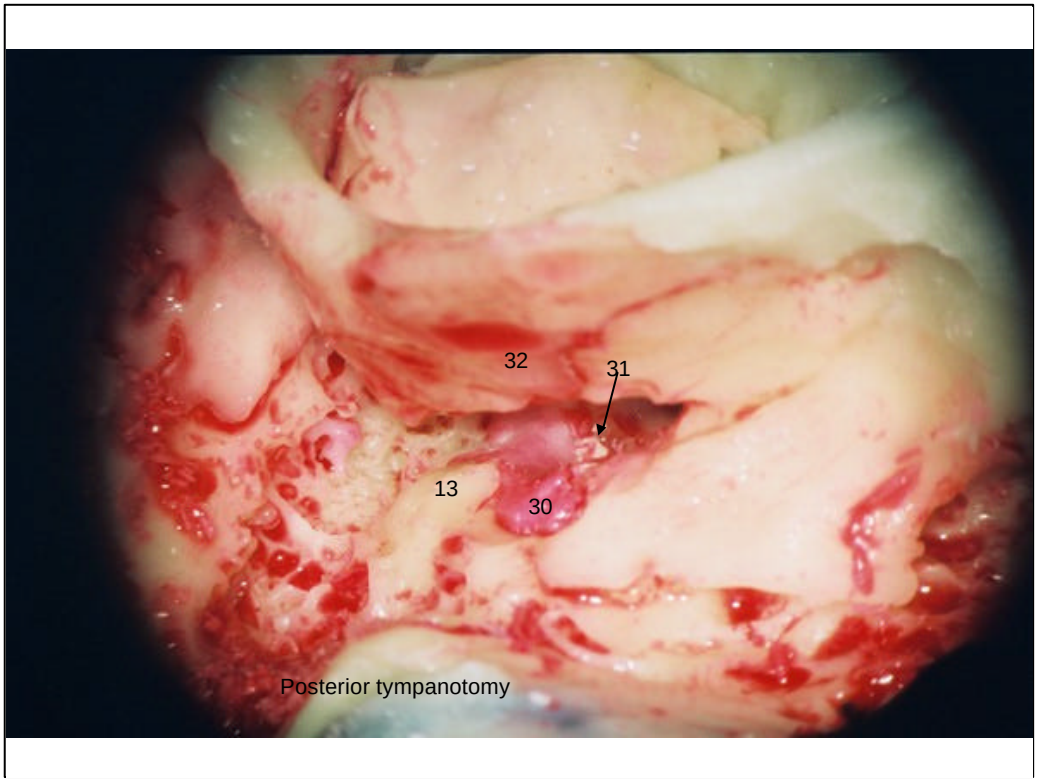


Bone removal for posterior tympanotomy

12 Head of malleus. **13** Lateral semicircular canal. **27** Horizontal part of facial nerve. **28** Bone to be removed. **29** 1.5mm bur.

Posterior Tympanotomy

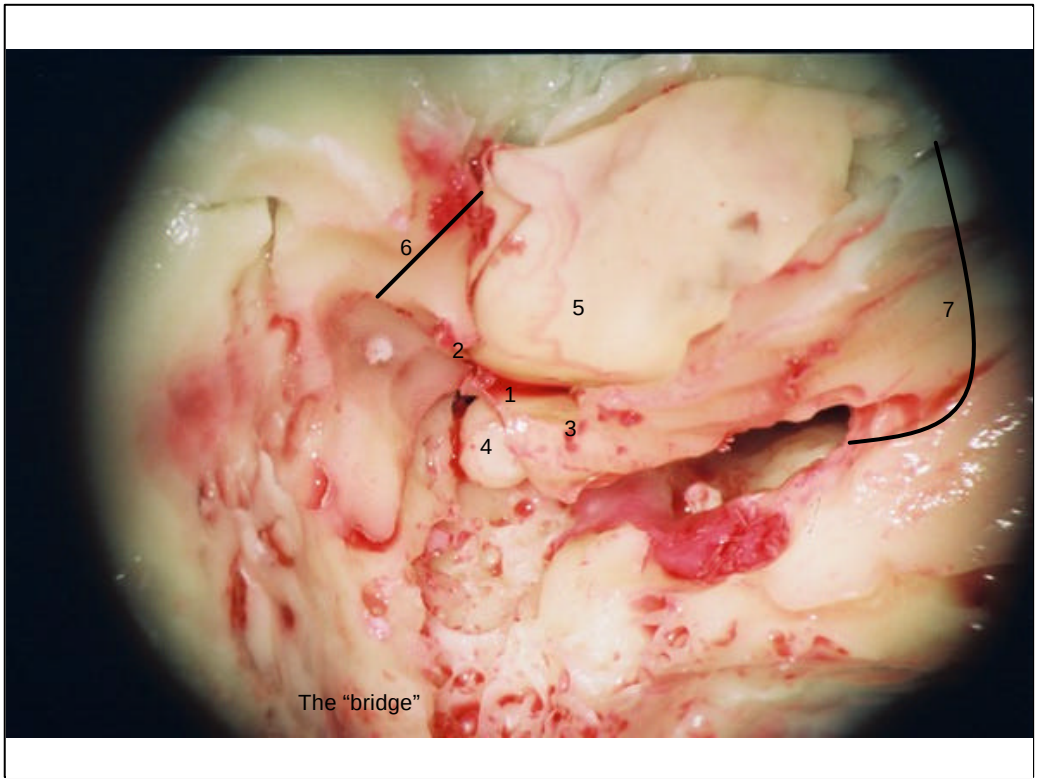
This allows a view of the middle ear from a posterior aspect. A 2mm wide strip of bone is drilled out between the vertical part of the facial nerve and the bony EAC. Start with a 1.5mm bur at the fossa incudis and work parallel to the vertical part of the facial nerve until you have a view of the stapes.



13 Lateral semicircular canal. **30** Second genu of the facial nerve. **31** Head of stapes. **32** Bony posterior wall of external auditory canal.

Now you are can identify the facial nerve and that stapes you can continue the posterior tympanotomy further inferiorly and obtain a view of the promontory and round window niche.

Modified radical mastoidectomy



1 The “bridge.” **2** Anterior “buttress.” **3** Posterior “buttress.” **4** Head of malleus. **5** Skin of EAC. **6** Bony removal anteriorly. **7** Bony removal inferiorly.

Modified Radical Mastoidectomy

The aim of this procedure is to make a common cavity the mastoid air cells, the antrum, the epitympanum and the EAC.

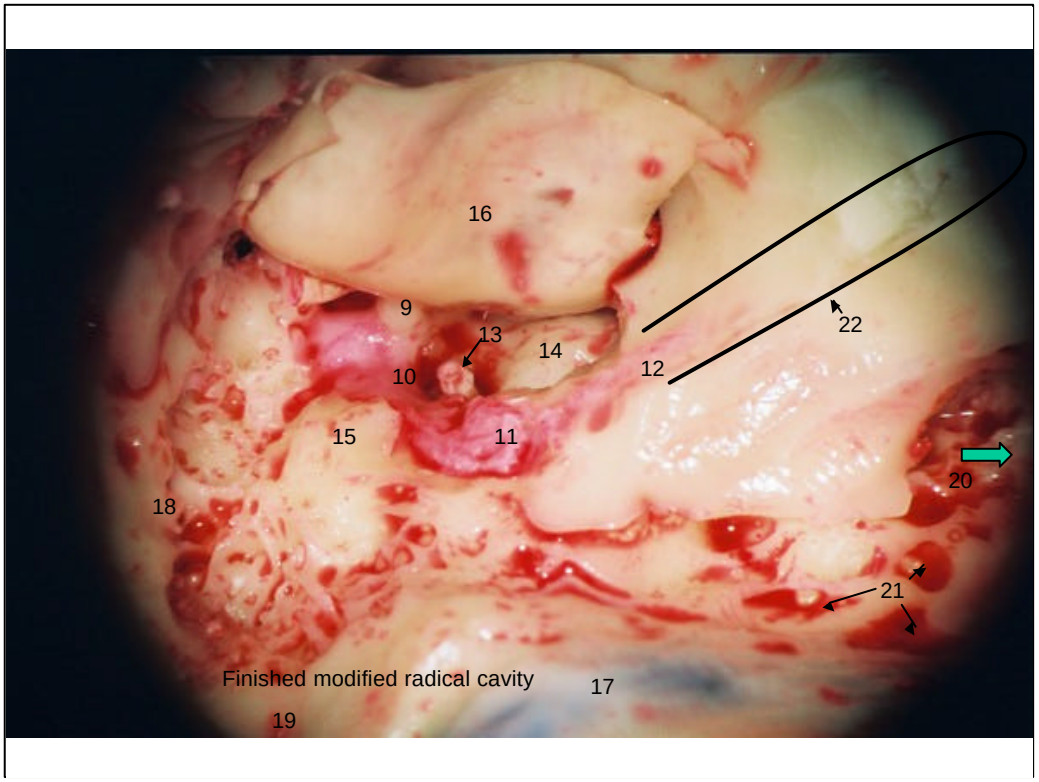
To convert a cortical mastoidectomy to a modified radical the posterior and superior walls of the EAC have to be removed. The tympanic membrane, handle of malleus and stapes and tympanum remain.

Begin with a 5.5mm bur removing the EAC. The most medial 2-3mm of the posterosuperior EAC bridges over the incus, lateral semicircular canal and the second genu of the facial nerve. Removal of this "bridge" should be done with especial care. Once the bridge is breached use a curette to remove its anterior and posterior buttresses. The facial ridge is the bone covering the vertical part of the facial nerve. The facial ridge is lowered medially to the level of the annulus and inferiorly to the level of the floor of the EAC.

4 Head of malleus. **8** House Dieter malleus nippers **9** Cochleariform process. **10** Horizontal facial nerve.

Amputate the head of the malleus by placing the House Dieter malleus nipper at the neck of the malleus, immediately superior to the cochleariform process.

Place a large piece of fascia on the walls of mastoid cavity and lay on top the skin flaps of the EAC.



10 Horizontal part of facial nerve. **11** Second genu of facial nerve. **12** Vertical part of facial nerve. **13** Head of stapes. **14** Promontory. **15** Lateral semicircular canal. **16** Skin of EAC. **17** Sigomoid sinus. **18** Middle fossa plate. **19** Sinodural angle. **20** Arrow points to mastoid tip. **21** Air cells. **22** Bone to be removed to expose facial nerve.

Note the 3 landmarks you will need when operating on the diseased, distorted ear, the cochleariform process, (the origin of tensor tympani tendon, the most dependable landmark), the stapes or oval window, and the lateral semicircular canal.

To convert this modified radical mastoidectomy to a radical mastoidectomy cavity remove the tympanic membrane and handle of the malleus.