

A decorative border consisting of a grid of blue ear icons. The icons are arranged in two rows: the top row has 12 icons and the bottom row has 10 icons, all facing right. The background of the slide is a light blue gradient.

Surgical Correction of Conductive Hearing Loss

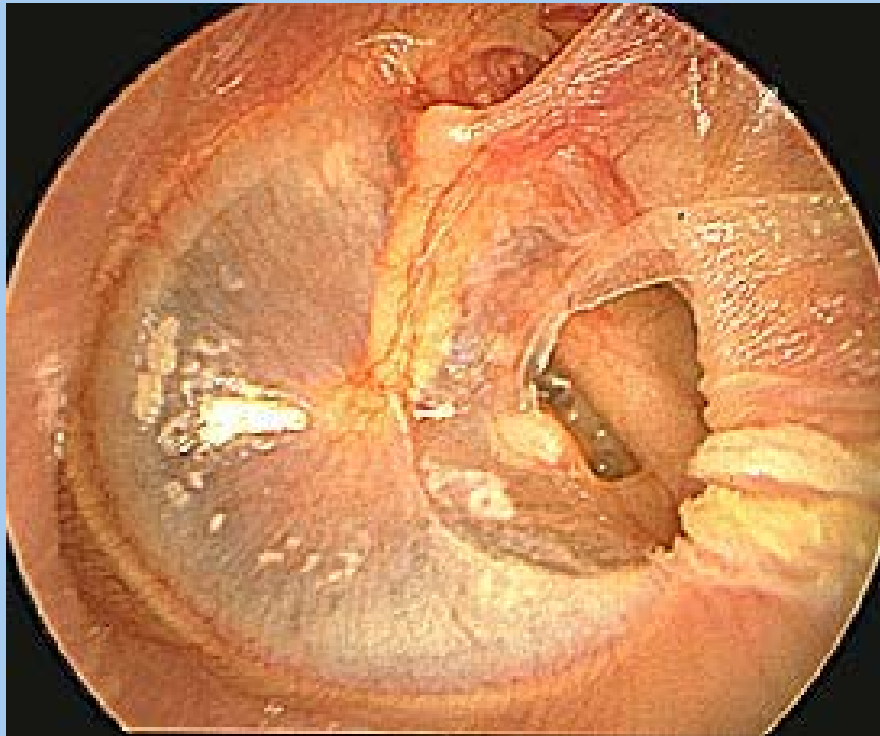
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University of Iowa Hospitals and Clinics

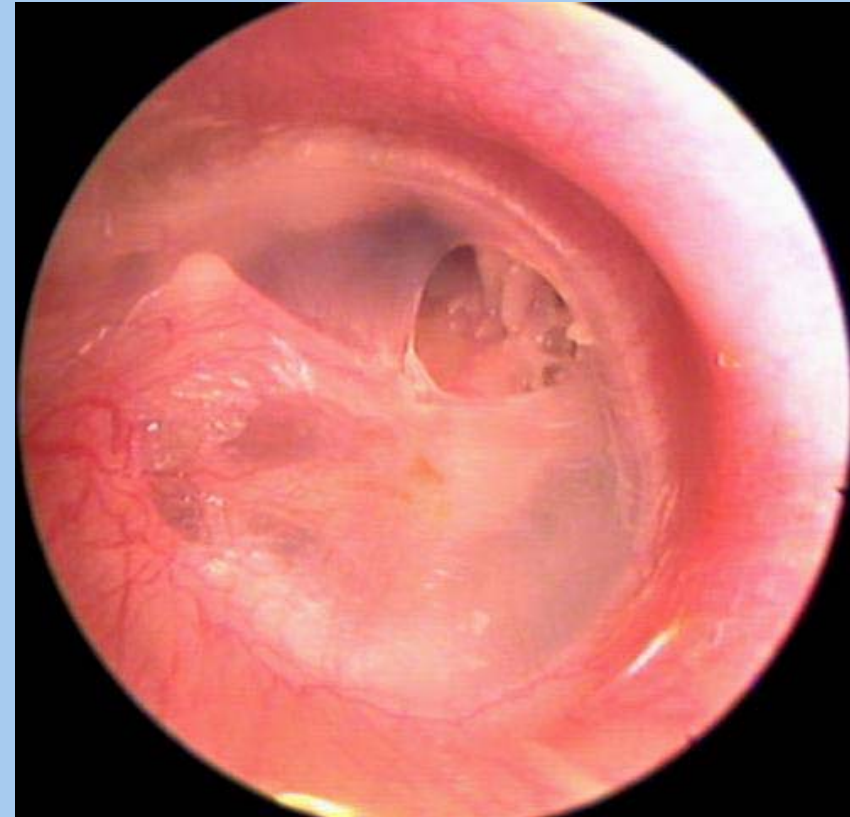
Intact Tympanic Membrane



TM Perforation



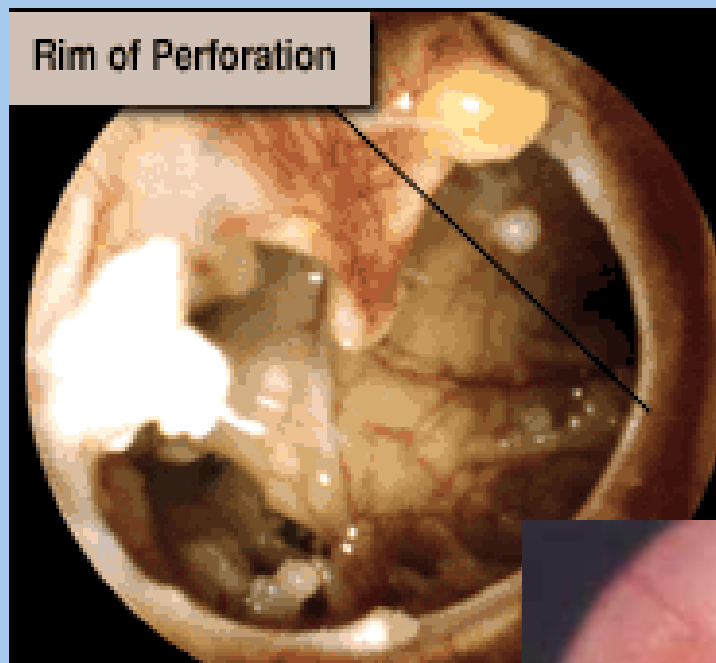
Marginal TM Perforation



Central TM Perforation

TM Perforation: Classification

- Marginal vs. central
- Quadrant
- Size
 - Percentage



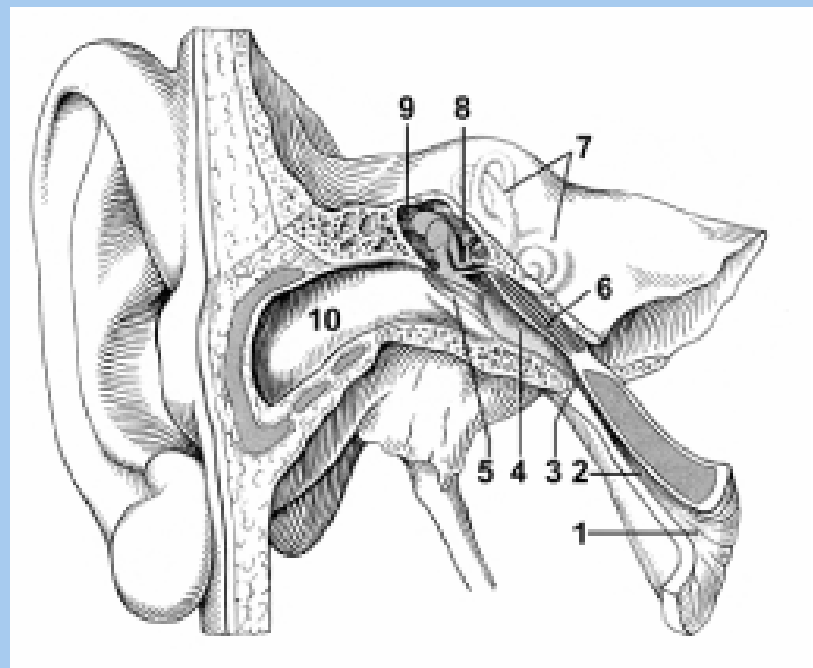
A decorative border consisting of a repeating pattern of stylized ear icons in a light blue color, running along the top and left edges of the slide.

Tympanoplasty

- Definition: Repair of the tympanic membrane (TM) with inspection of middle ear & possible ossicular chain reconstruction
 - This is different than a myringoplasty
- Indications:
 - Prevent recurrent disease
 - Improve hearing
 - Provide a dry ear canal
 - Enable patient to bathe & swim freely

Tympanoplasty

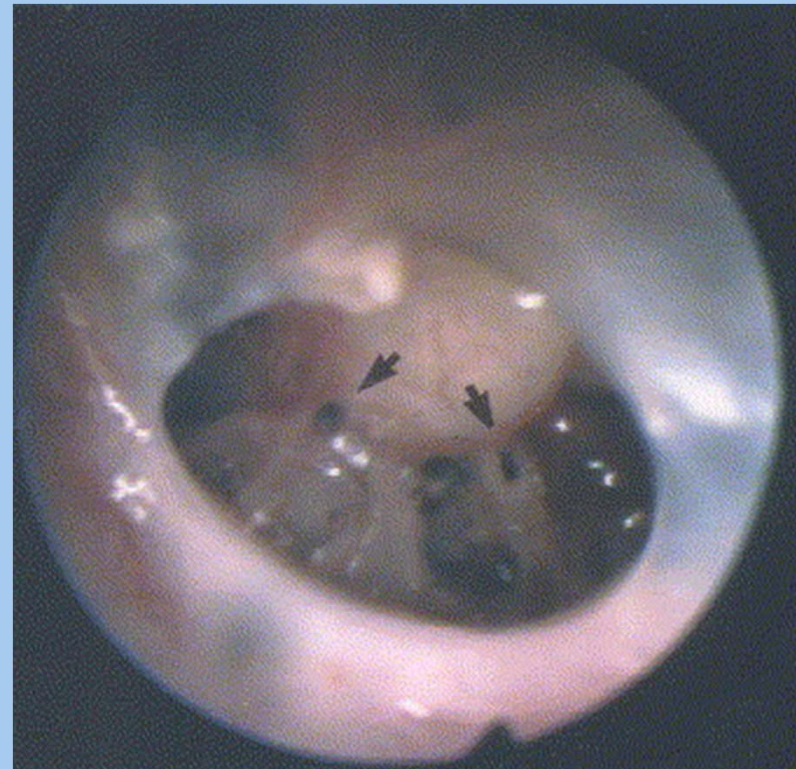
- Appropriate candidates:
 - Perforation of TM
 - Cholesteatoma / other lesion involving TM or tympanic cavity
 - Resolved otorrhea
 - Preferably no Eustachian tube dysfunction



Tympanoplasty

- Poor Candidates:

- Multiple failed attempts at closure
 - Poor Eustachian tube function
- Smoker
- Systemic disease
 - DM
 - Steroid use
- Actively draining
- Slag injury



Slag injury – retained metallic debris

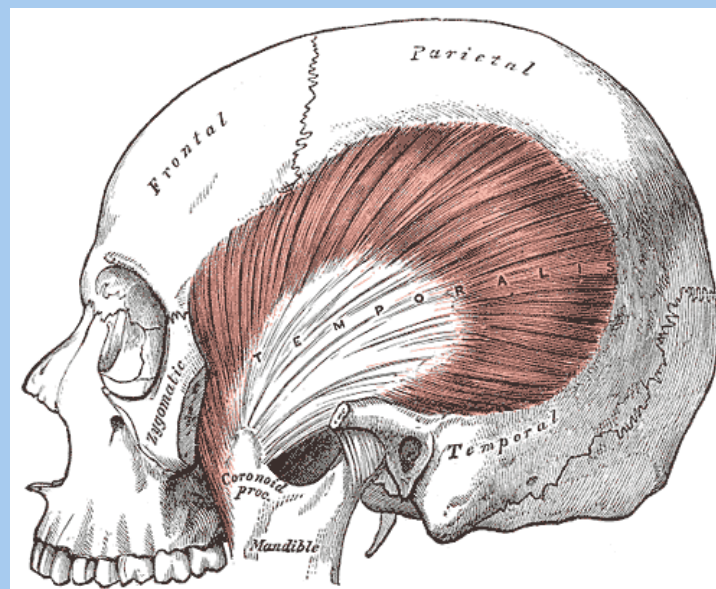
Tympanoplasty

- Commonly used materials:

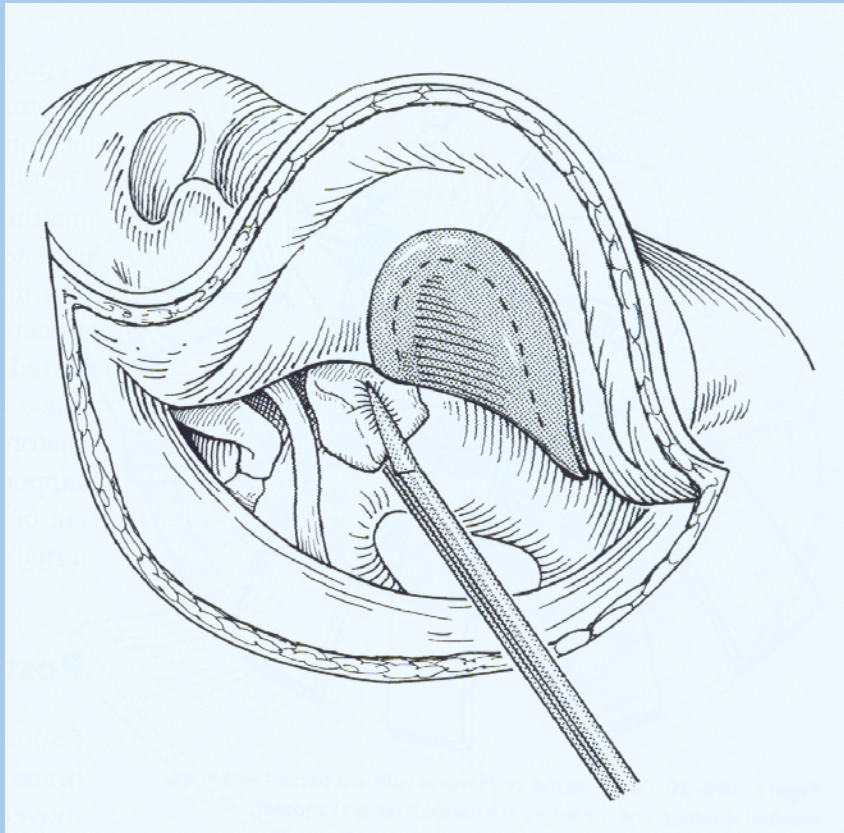
- Temporalis fascia
- Perichondrium/cartilage
- Periosteum
- Alloderm

- Techniques

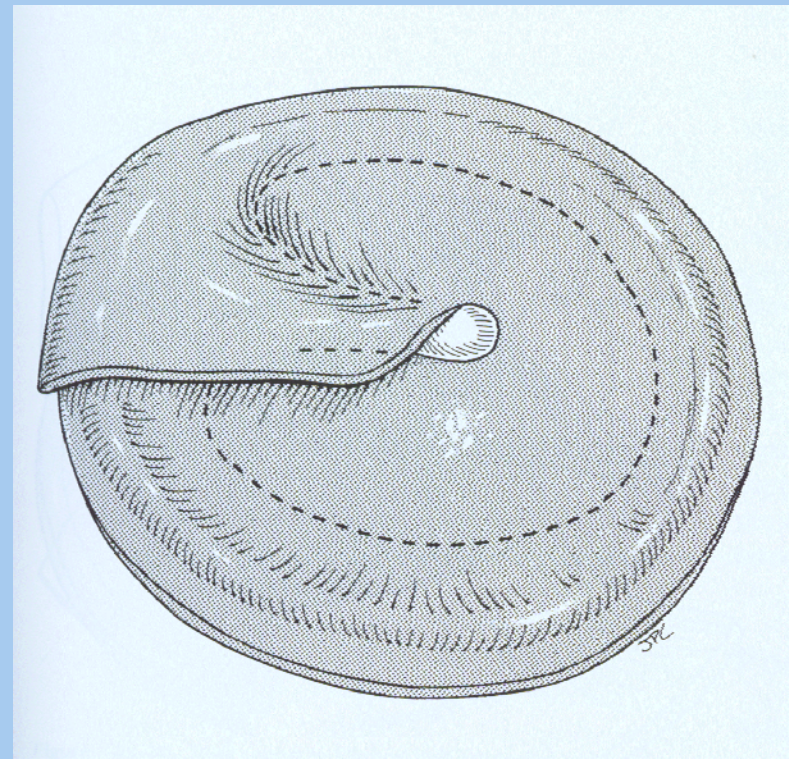
- Overlay
- Underlay



Underlay v. Overlay




Underlay= medial



Overlay= lateral



Soft tissue

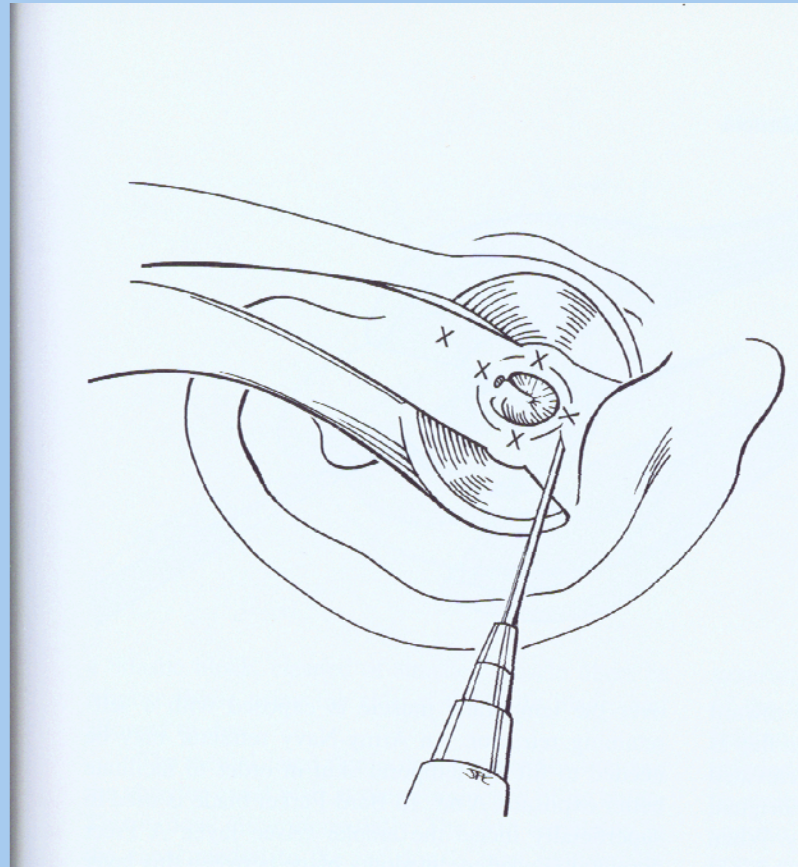
- 
- Transcanal
 - For most cases
 - Post auricular
 - For lateral grafts
 - Good for kids
 - Endaural
 - When need canalplasty
 - Good for kids

A decorative border of blue ear icons runs along the top and left sides of the slide. The top border consists of 12 icons, and the left border consists of 12 icons, all arranged in a repeating pattern.

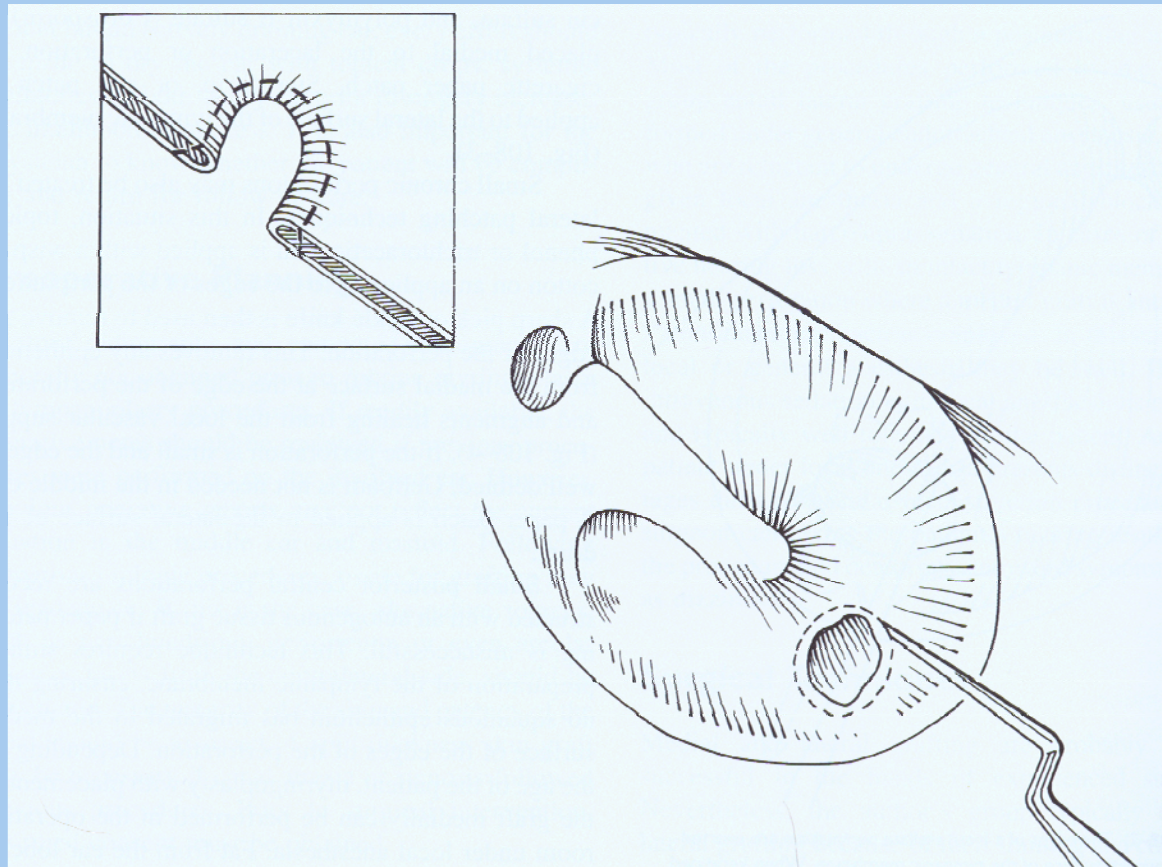
Underlay technique— selection of patients

- Posterior central perforations
- “Smaller” perforations
- Any perforation with intact annulus

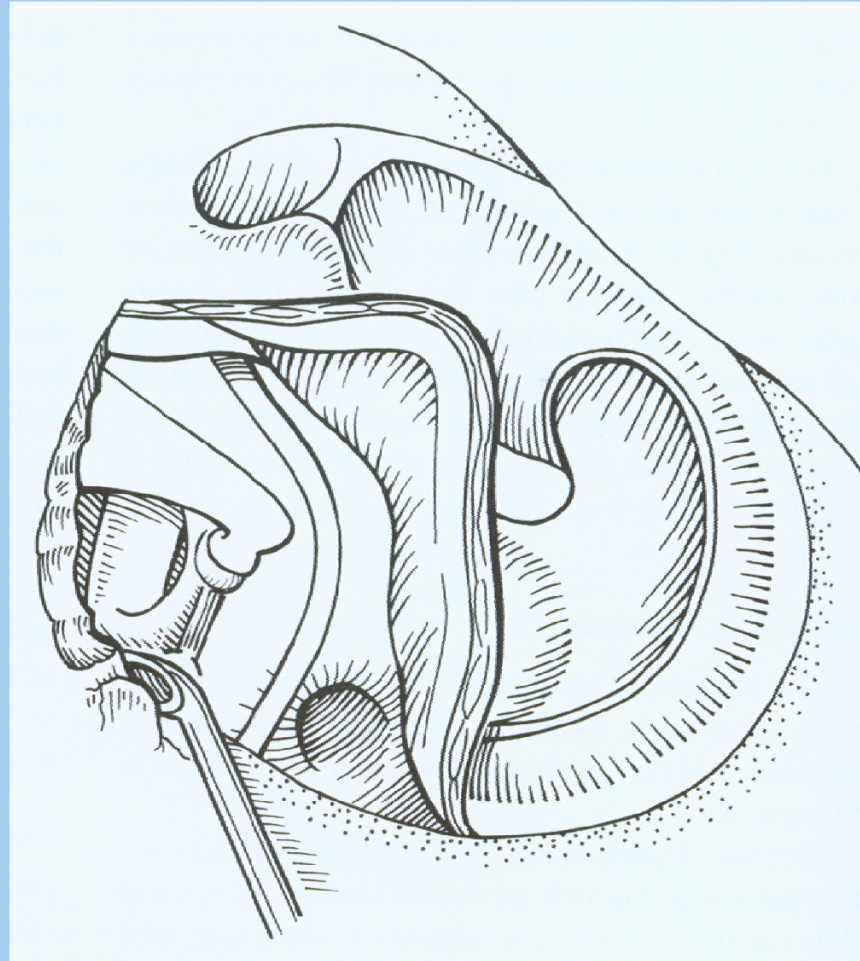
Underlay technique—procedure



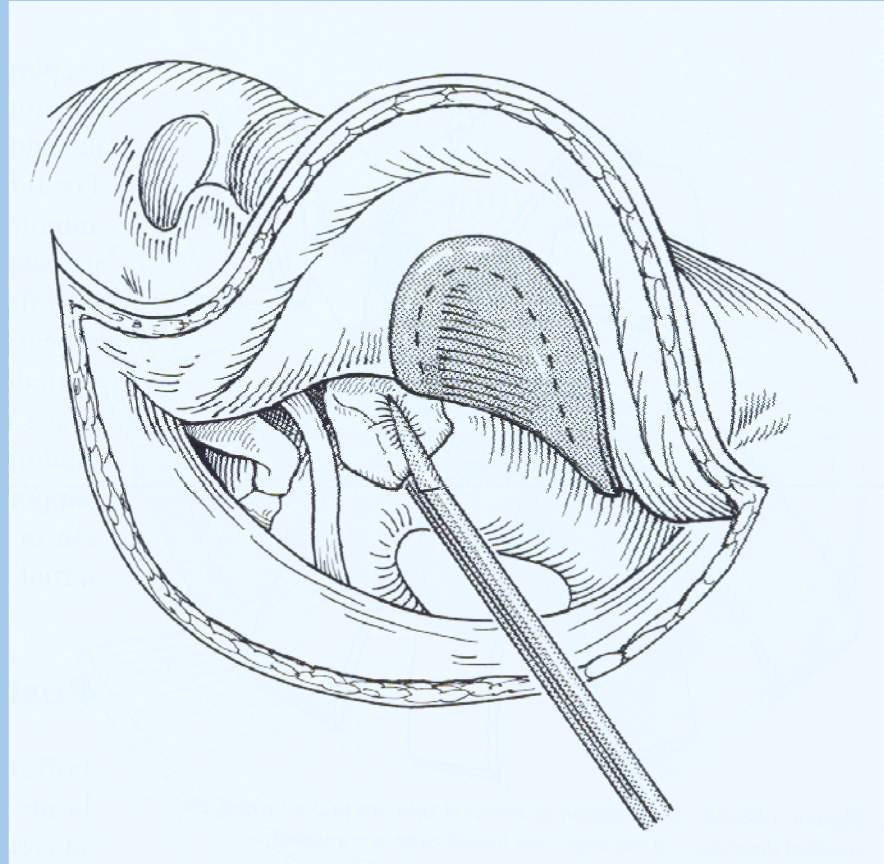
Underlay technique—procedure



Underlay technique—procedure

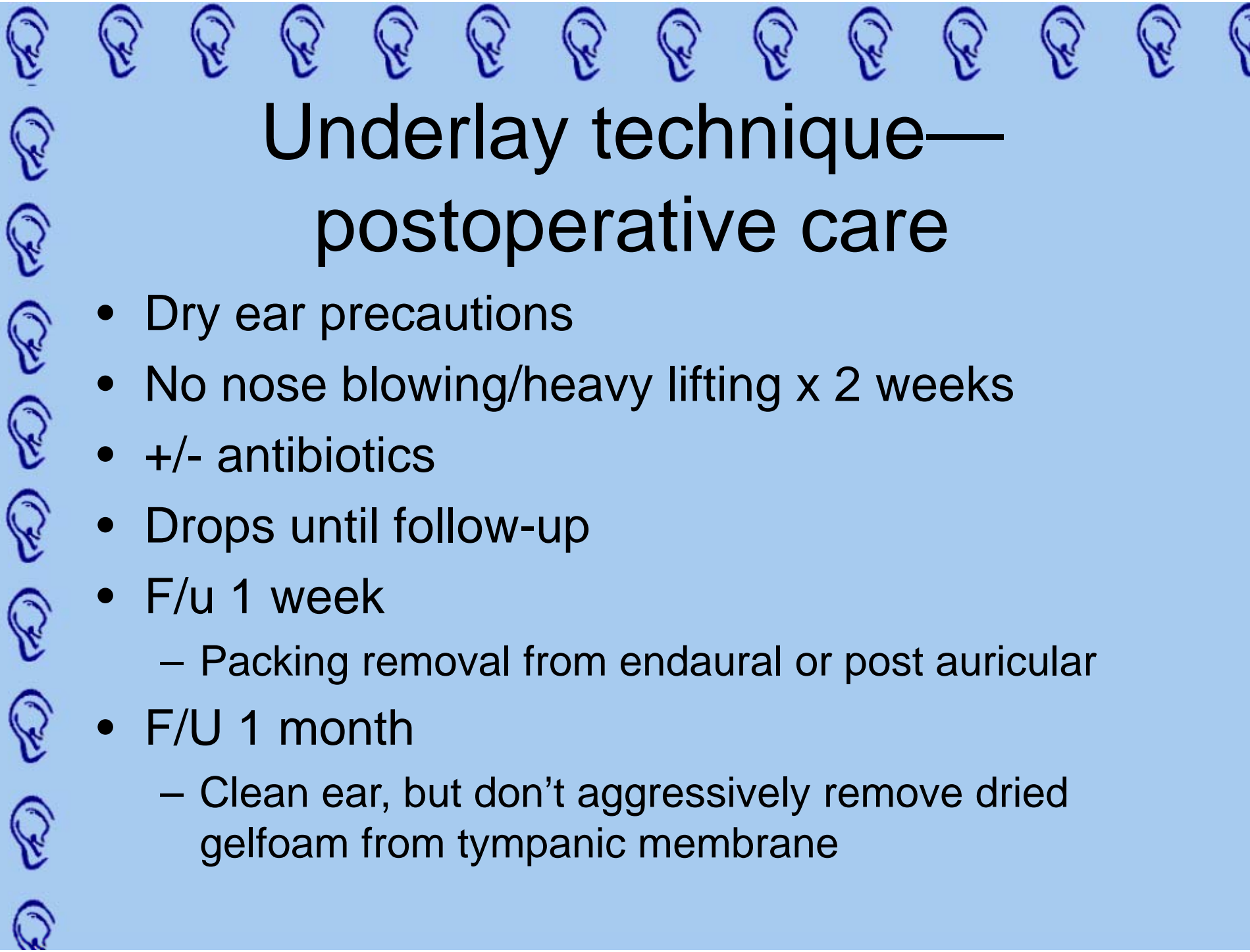


Underlay technique—procedure



Underlay/Medial Technique



A decorative border consisting of a repeating pattern of stylized ear icons in blue, arranged in two horizontal rows along the top and left edges of the slide.

Underlay technique— postoperative care

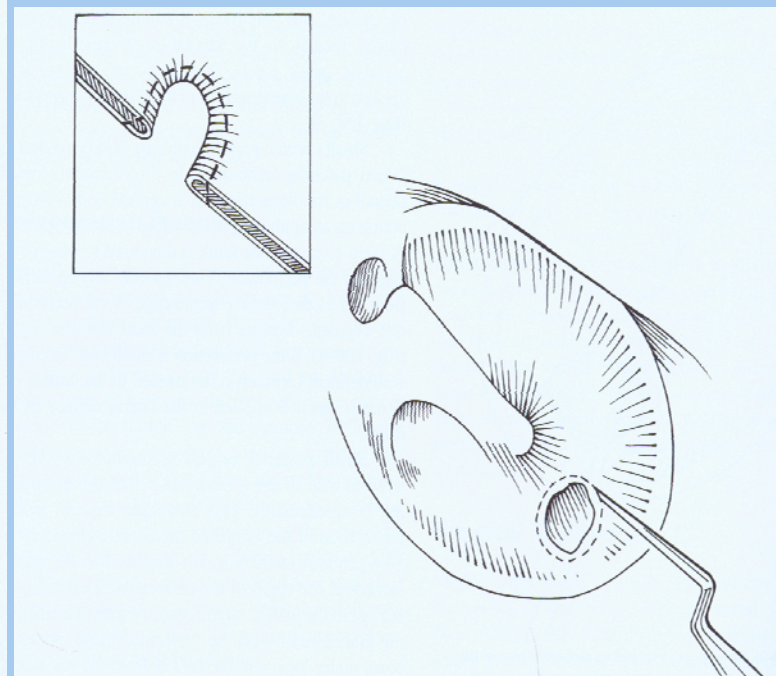
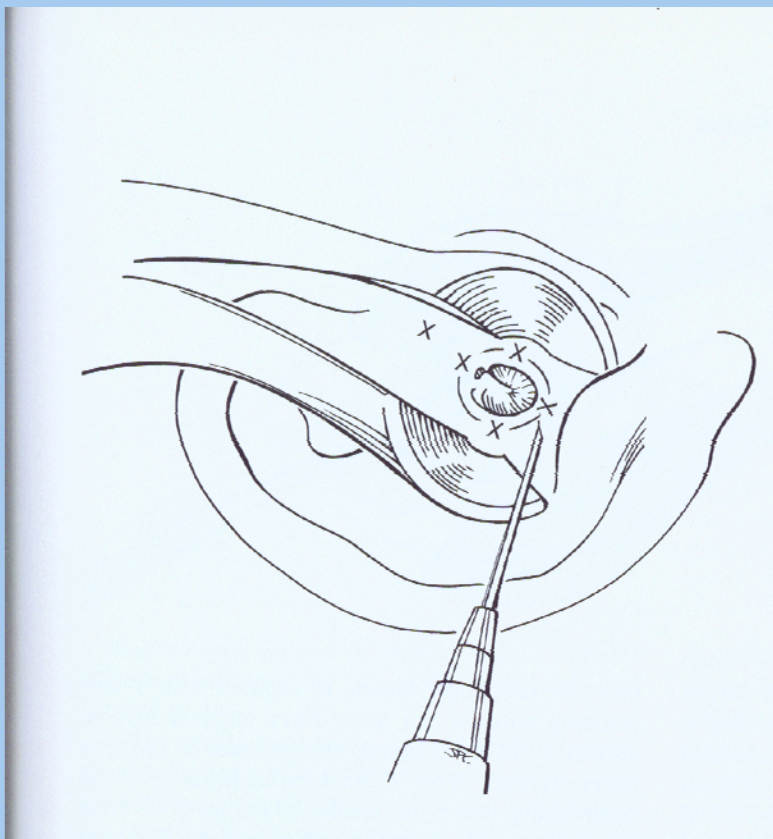
- Dry ear precautions
- No nose blowing/heavy lifting x 2 weeks
- +/- antibiotics
- Drops until follow-up
- F/u 1 week
 - Packing removal from endaural or post auricular
- F/U 1 month
 - Clean ear, but don't aggressively remove dried gelfoam from tympanic membrane

A decorative border consisting of a repeating pattern of stylized ear icons in blue, arranged in two rows along the top and left edges of the slide.

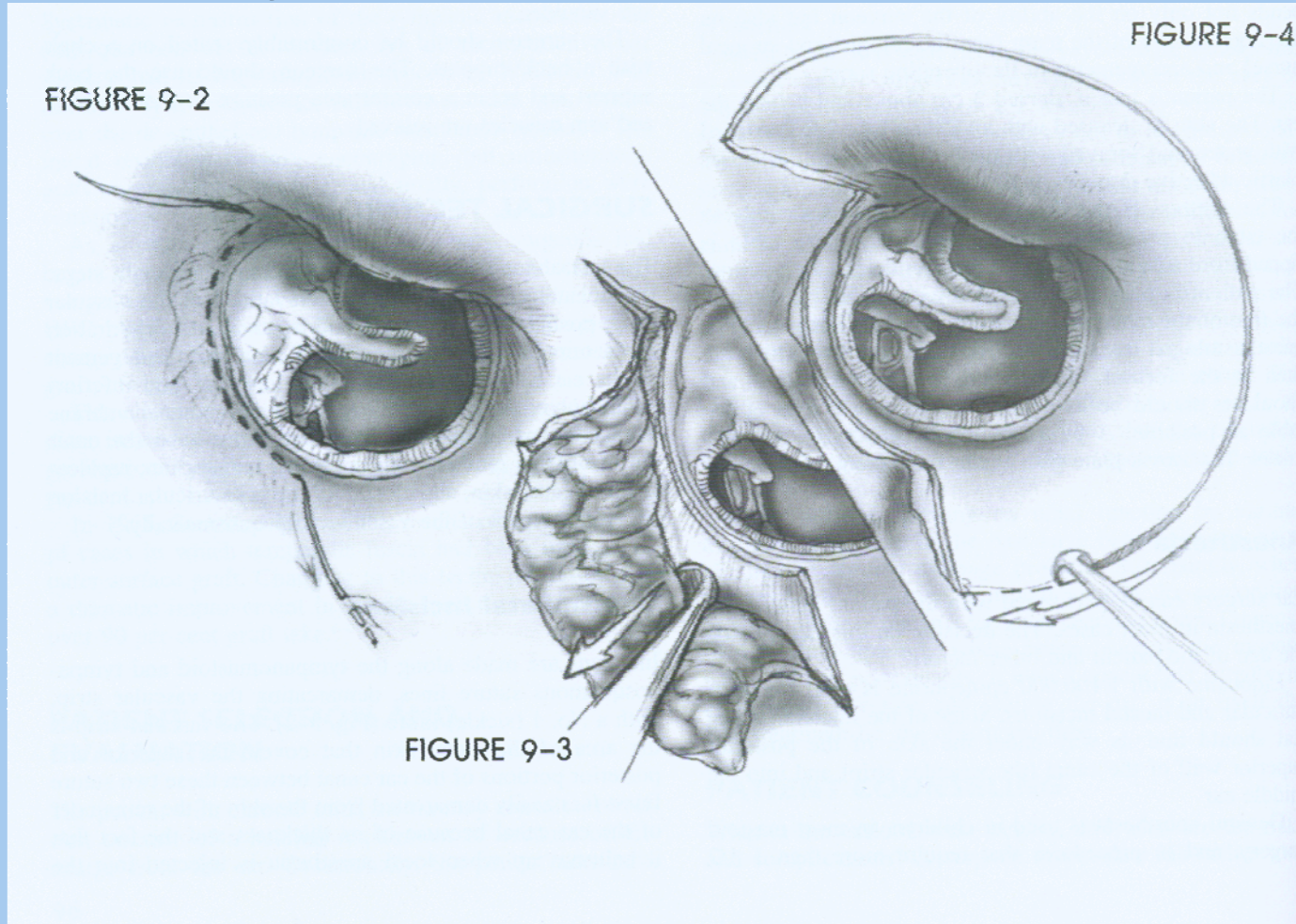
Overlay technique— selection of patients

- Marginal perforations
- Total perforations/“larger perforations”
- Need for canalplasty
- Previously failed tympanoplasties

Overlay technique—procedure



Overlay technique—procedure



Overlay technique—procedure

FIGURE 9-5

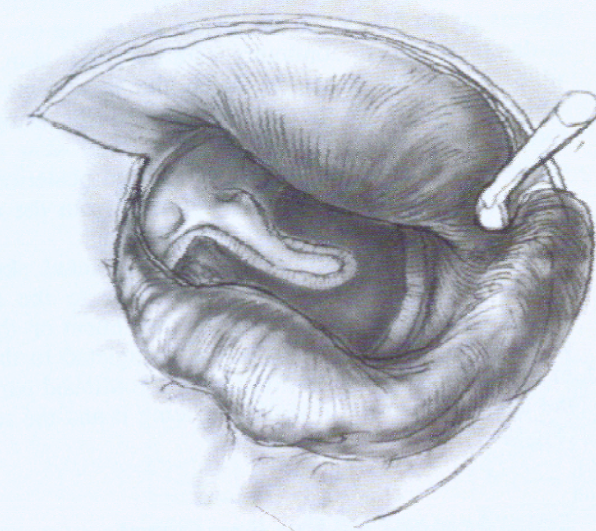


FIGURE 9-6

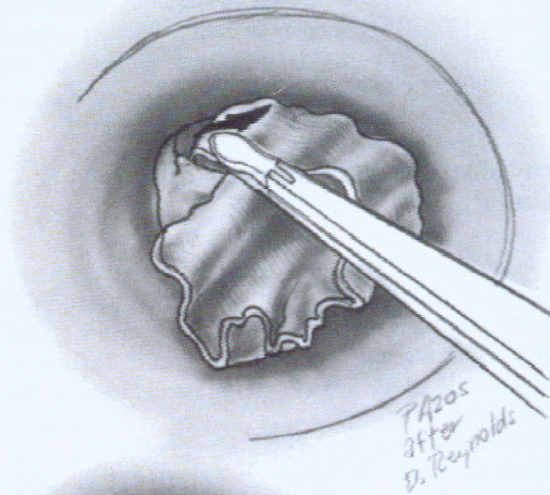


FIGURE 9-7

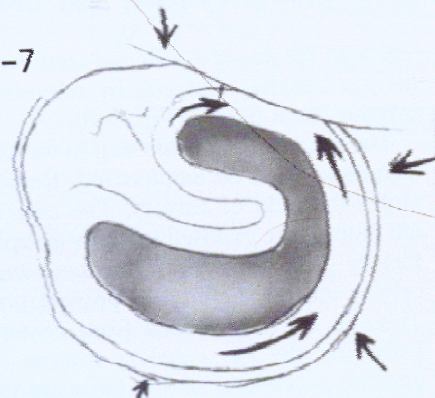
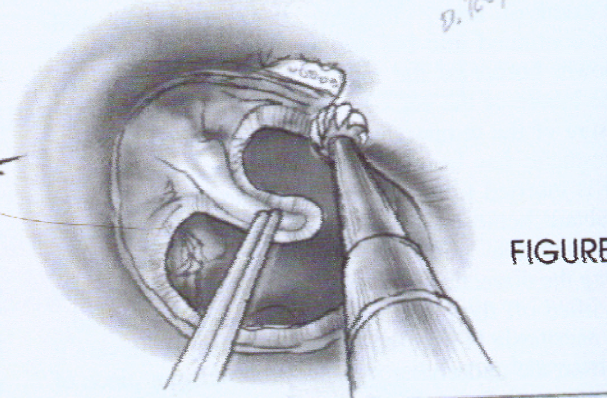


FIGURE 9-8





Overlay technique—procedure

FIGURE 9-9

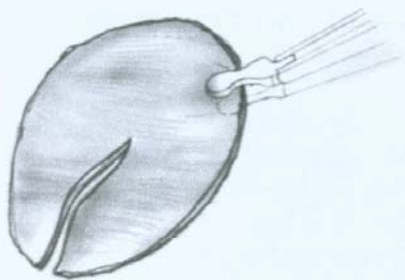


FIGURE 9-10

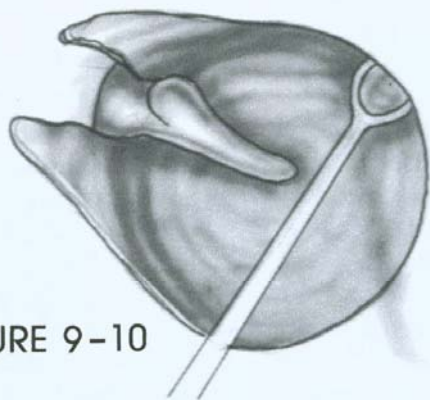


FIGURE 9-11

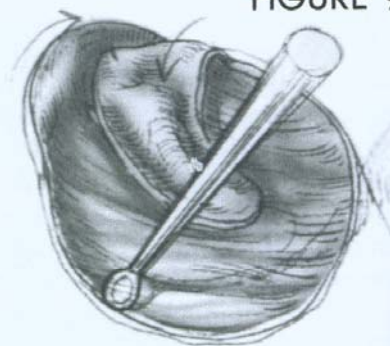


FIGURE 9-13

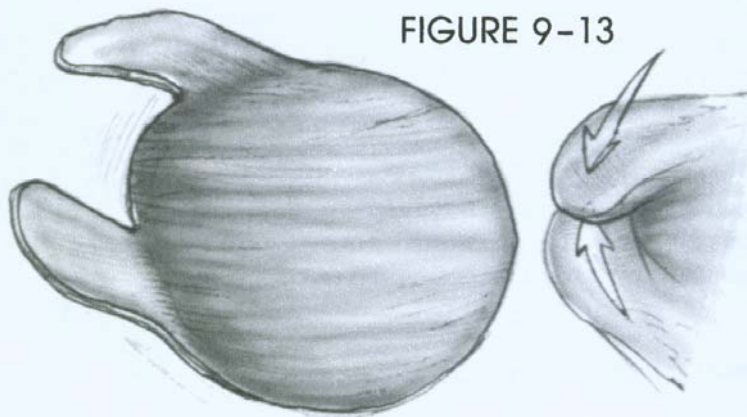
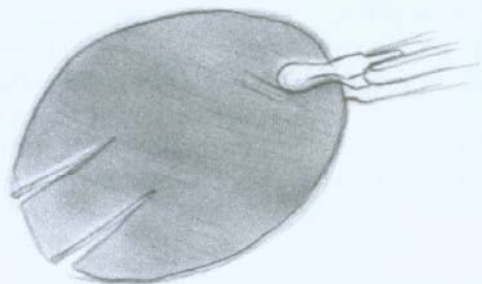


FIGURE 9-12





Overlay technique— postoperative care

Dry ear precautions

No nose blowing/heaving lifting x 2
weeks

F/U 6-8 weeks (gelfoam packing
removal)

Drops after pack removal until follow-up



Tympanoplasty--complications

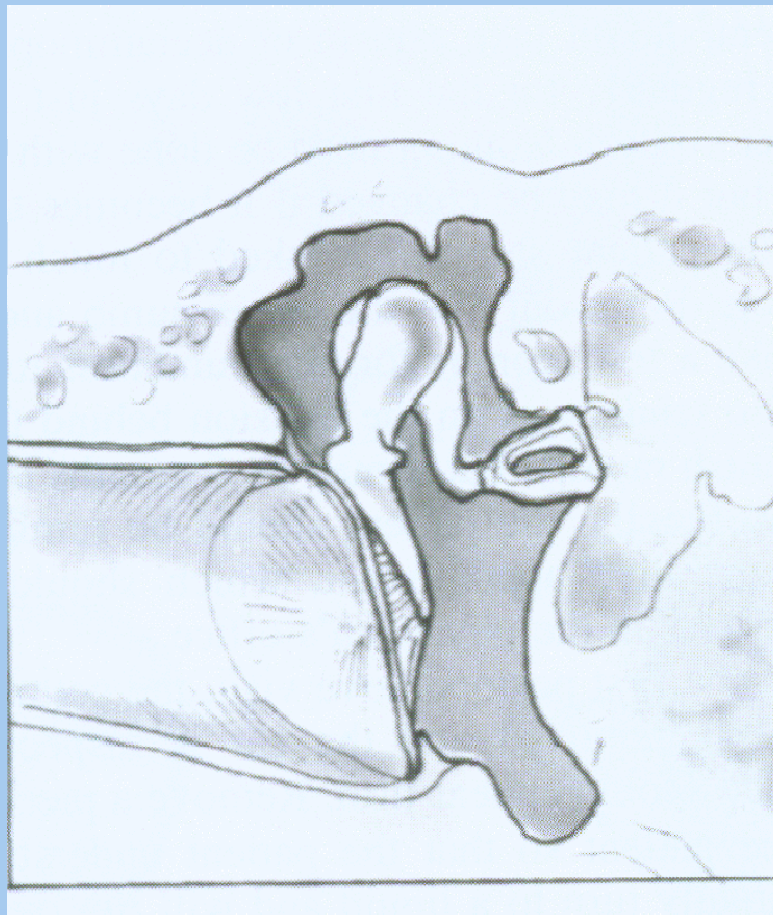
- Persistent / recurrent perforation
- **Cholesteatoma** (ME, drum, EAC)
- Dysguesia
- **Blunting**
- **Lateralization**
- SNHL / vertigo
- Facial nerve injury

Lateralization

Unique to overlay technique

Can affect hearing result if severe

Correct by repeat t-plasty & tuck edges of graft under malleus

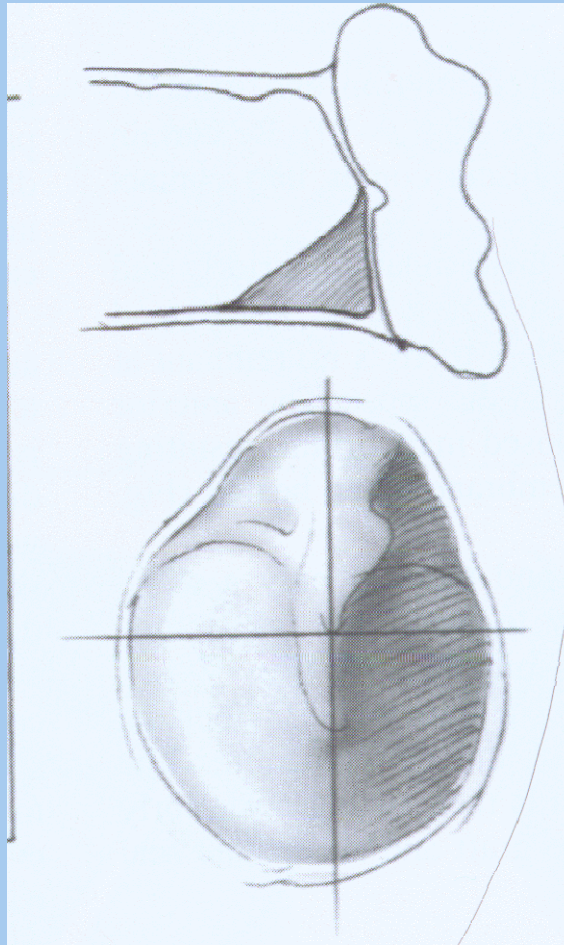


Blunting

Lateralization of
anterior graft

Unique to overlay
technique

Can affect hearing
result if severe





Tympanoplasty

Wullstein (1956)

- Type I
- Type II
- Type III
- Type IV
- Type V

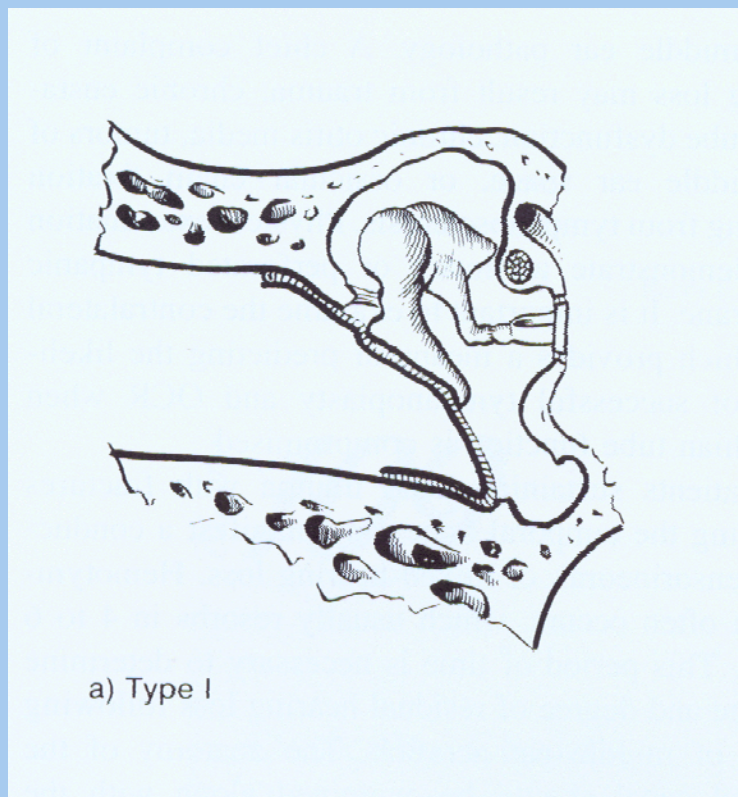


Types of tympanoplasty

Type I—

contact ossicular chain

- simple tympanoplasty
- Myringoplasty



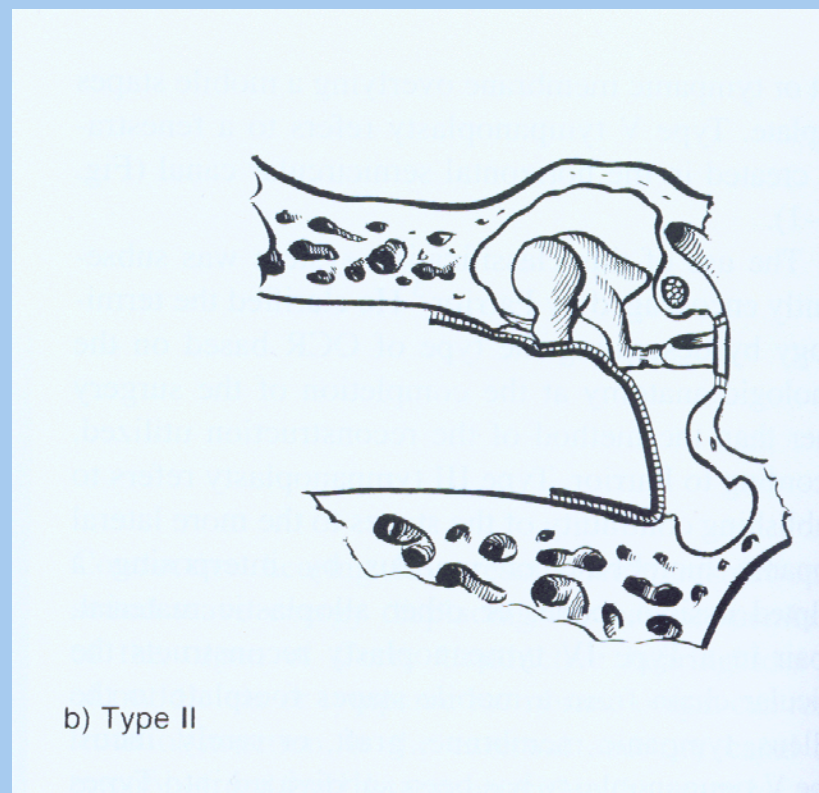


Types of tympanoplasty

Type II—

contact incus and stapes with
erosion of malleus

- TM onto incus
= **incudopexy**
- TM onto malleus remnant

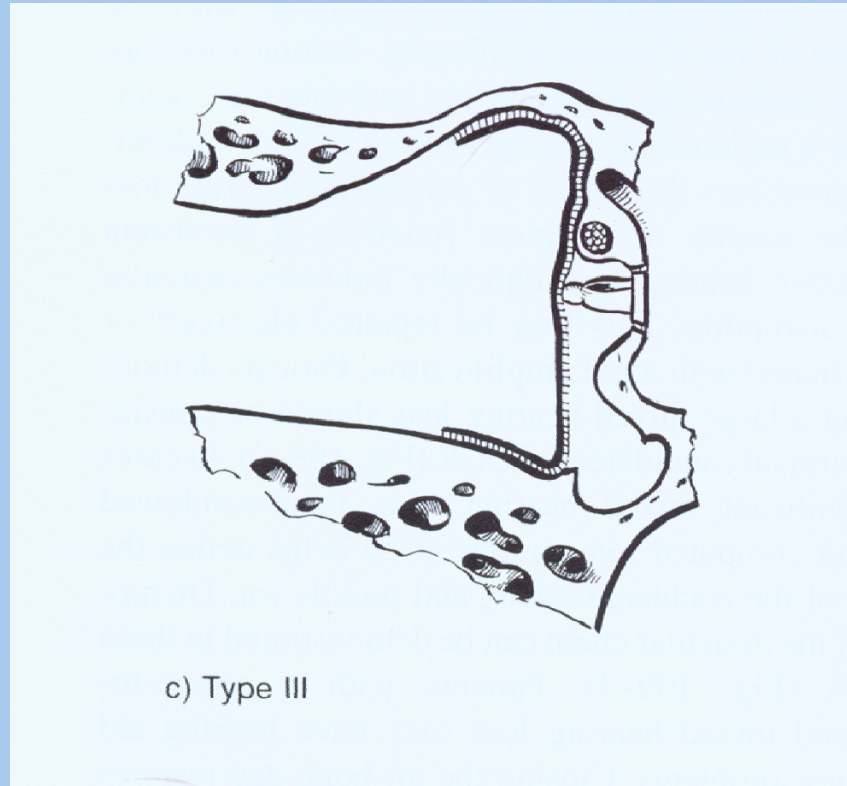


Types of tympanoplasty

Type III—

contact mobile stapes
superstructure

- TM onto capitulum of stapes
- with insufficient contact of incus to stapes



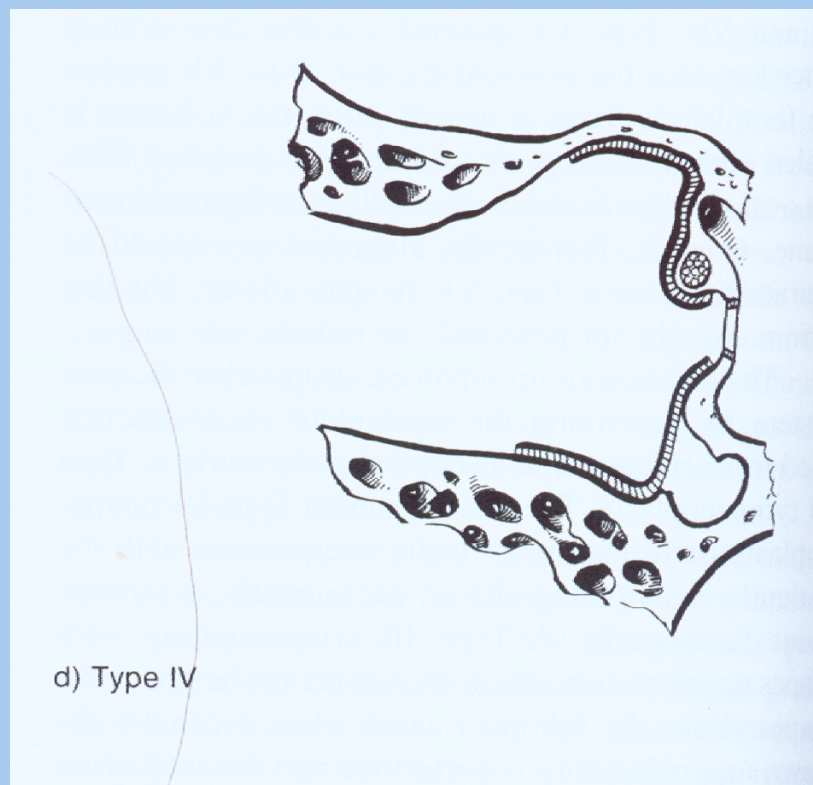


Types of tympanoplasty

Type IV—

contact stapes footplate with
absent or eroded stapes
superstructure

- TM onto footplate
- Footplate MOBILE
- TM covers RW

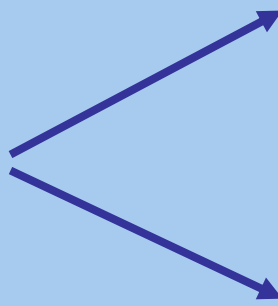




Types of tympanoplasty

Type V

Immobile
footplate



V_a = fenestration of horizontal
semicircular canal

V_b = stapedectomy/ OCR with
open footplate

Ossicular disorders

Types

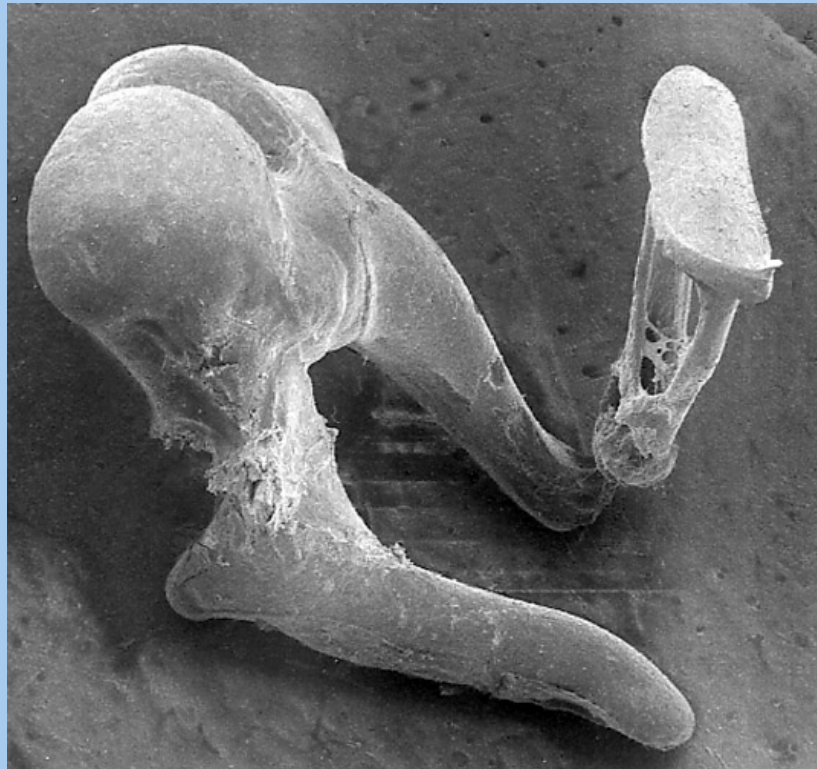
- Ossicular discontinuity
- Ossicular fixation

Causes

- Chronic otitis media
- Trauma
- Congenital
- Tympanosclerosis
- Otosclerosis

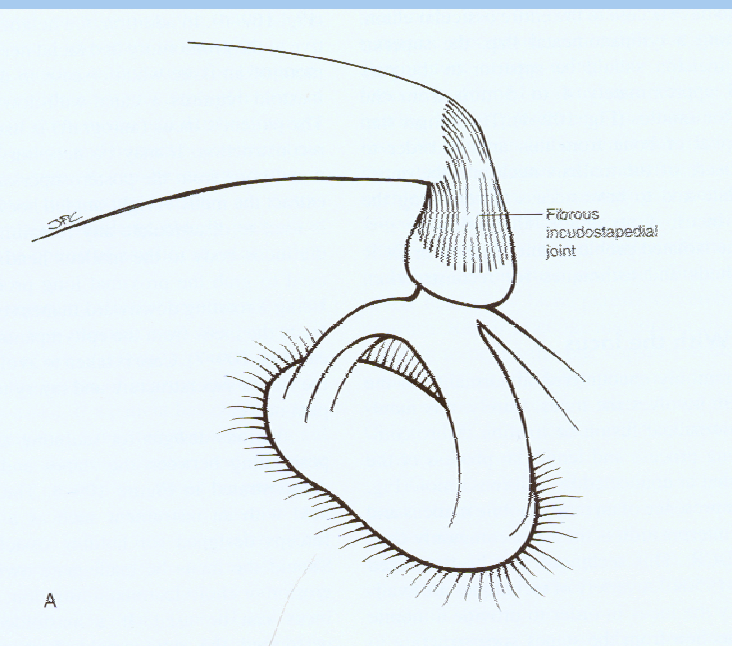
Symptoms

- CHL
- Dizziness/SNHL

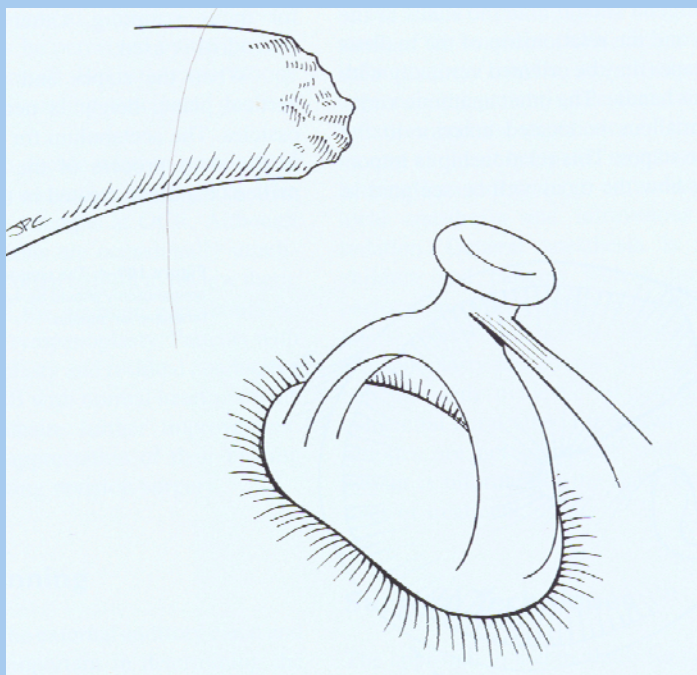




Common ossicular disorders



Fibrous IS joint



Incus erosion



Ossicular disorders— Therapeutic options

Hearing aid

Bone anchored hearing aid (Baha)

– Check out the protocol (thanks Ryan!)

Surgery (ossicular chain reconstruction)



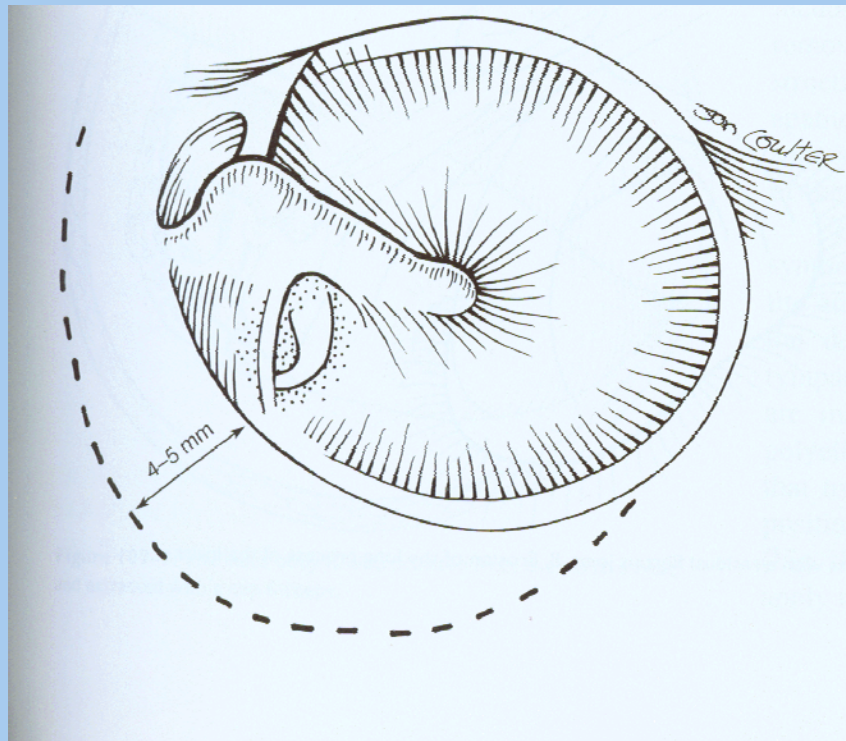
Ossiculoplasty (OCR)

Appropriate candidates:

- Resolved otorrhea with no middle ear disease
- Conductive or mixed hearing loss
- No Eustachian tube dysfunction (ideal)
 - Need enough middle ear space and aeration to allow for prosthesis and function
- Previous CWU or CWR for second-look



Ossiculoplasty (OCR)—technique

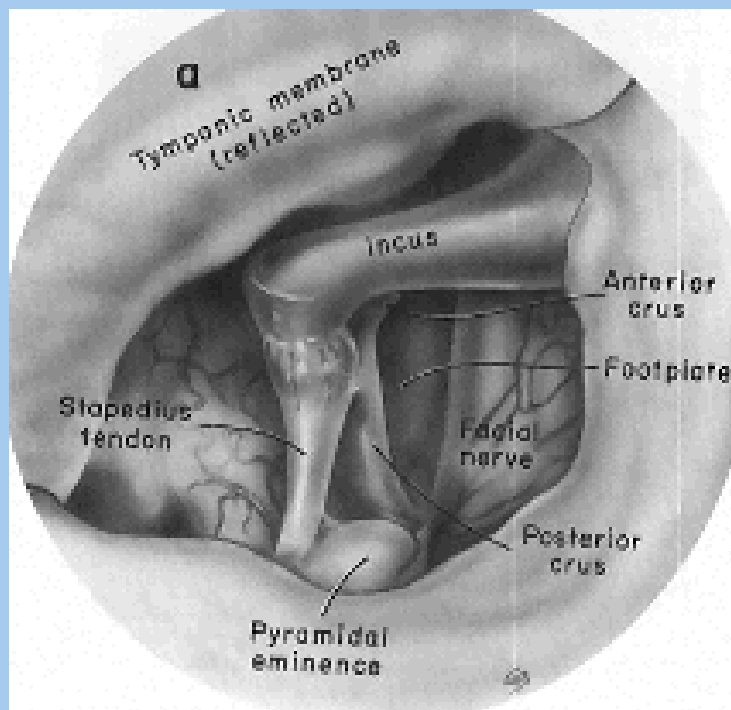




Surgical technique: Exploration

inder and Fisch, 2007:
Need to ID four crucial
structures:

- . **Anterior malleal ligament and process**
- . Inferior incudomalleal joint
- . Stapes and pyramidal process
- . **Round window niche**





Special considerations for CWR

The middle ear space is usually slightly more medial than before

- Make flap longer so that it will reach after prosthesis + cartilage placement

Facial nerve considerations

- Medial displacement of annular ring/edge of EAC will mean entering ME space closer to your facial nerve

Never trust FN to be bony covered

PORP

Partial Ossicular Replacement Prosthesis

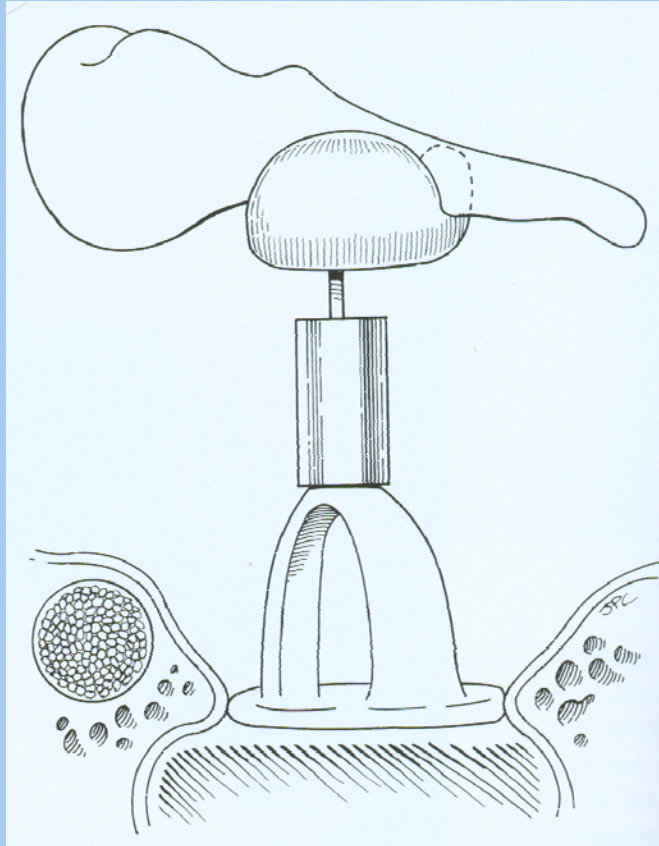
- Intact superstructure

Stapes

superstructure →

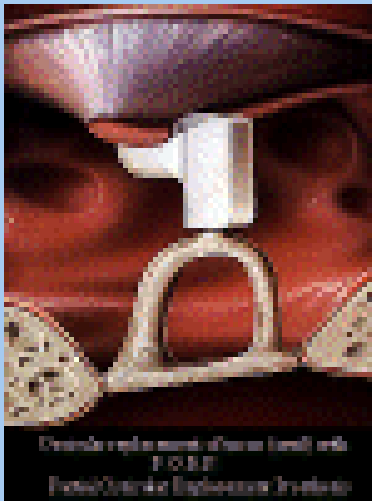
Incus or Malleus or

TM





PORP - Types



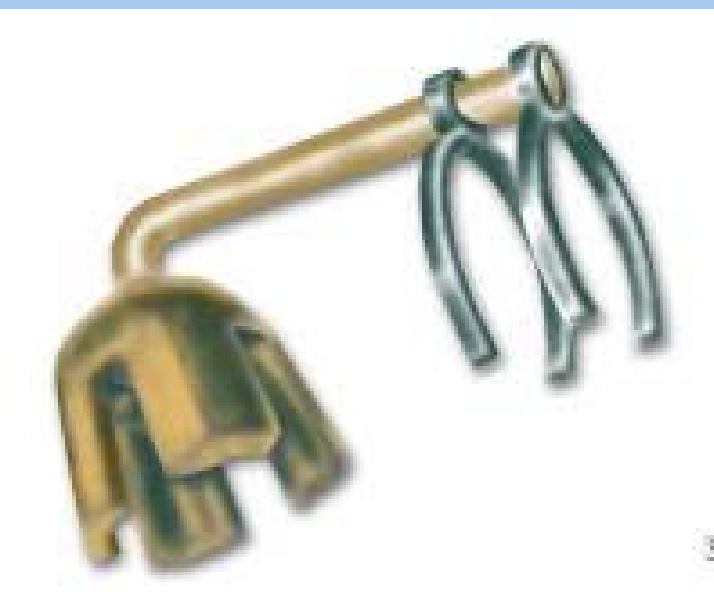


Grace ALTO

Partial		PRECISE OFF-CENTERED TITANIUM			Total
Material	Type	Material	Cat. #	Length	
Titanium	Centered	Titanium	700-300	3.00mm	
750-175	1.75mm		700-325	3.25mm	
750-200	2.00mm		700-350	3.50mm	
750-225	2.25mm		700-375	3.75mm	
750-250	2.50mm		700-400	4.00mm	
750-275	2.75mm		700-425	4.25mm	
750-300	3.00mm		700-450	4.50mm	
750-325	3.25mm		700-475	4.75mm	
750-350	3.50mm		700-500	5.00mm	
750-375	3.75mm		700-525	5.25mm	
750-400	4.00mm		700-550	5.50mm	
750-425	4.25mm	700-575	5.75mm		
750-450	4.50mm	700-600	6.00mm		
			700-625	6.25mm	
			700-650	6.50mm	
			700-675	6.75mm	
			700-700	7.00mm	



PORP with an eroded incus

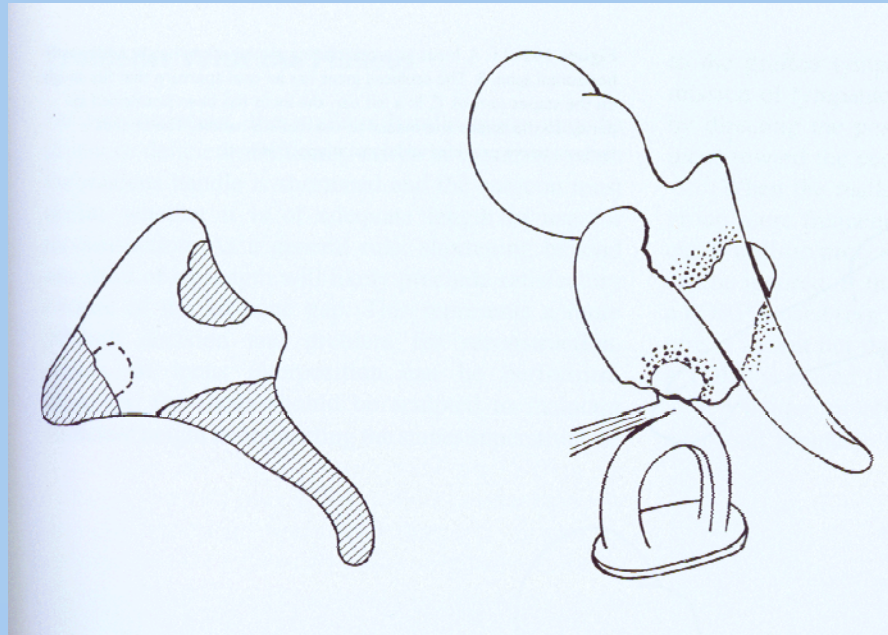


Applebaum

Incus interposition

Drill remaining incus to replace connections between ossicles

- Mainly used like PORP
- +/- cement
- Autologous tissue
 - Compatibility





Incus interposition video





TORP

Total Ossicular Reconstruction
Prosthesis

Footplate → malleus or TM

Oval window (with graft) → malleus or
TM



TORP

