OSSICULOPLASTY
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Techniques

Columellas
- Short (drum to stapes head)
- Long (drum to footplate)

Assemblies: Direct or L-strut
- Malleus-stapes
- Malleus-footplate

Other: (incudoplasty, neomalleus, etc.)
In most ossiculopasty situations, the incus is either damaged or fixed by the pathology present.
Early (1950s) ossiculoplasty experimental techniques.
Early Austin Teflon “umbrella” columella. Extrusions were common due to the biomaterial used and the sharp edged design.
COLUMELLAS

Short: Drum to Stapes head
Long: Drum to stapes footplate

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Short (drum to stapes head) columellar technique (PORP: partial ossicular replacement prosthesis).
Grace titanium PORP short columella, current usage.
Long (drum to footplate) columellar technique (TORP: total ossicular replacement prosthesis)
Columellar Ossiculoplasty Complications

- Extrusion
- Displacement
- Incorrect length
Columellar extrusion and displacement problems.
Titanium columella: Extrusion
Toppled hydroxylapatite columella (drum intact).
Assembly Ossiculoplasty

Varieties

- Direct struts
  - Short
  - Long

- Indirect L-struts
  - Short
  - Long
Direct malleus-stapes assembly technique (Spanner strut).
Grate direct malleus-stapes polyethylene strut, ca. 1983.

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Indirect / L-strut malleus-stapes assembly.
L-strut malleus-stapes assembly (Wehrs, ca. 1991)
Dornhoffer short and long indirect / L-strut assemblies, current usage.
Assembly Ossiculoplasty
Complications

- Angulation
- Footplate “skid”
Assembly angulation: dissipation of forces.
Malleus-stapes “footplate skid” potential.
Ossiculoplasty: vector forces. If the malleus-stapes angulation is greater than $45^0$, the efficiency of assemblies will decline.
Ossiculoplasty: angulation strategy.
Niche Techniques

- Incudoplasty: Repair of the damaged incus
- Neomalleus struts
- Other: e.g. homograft drum and chain methods, stapedectomy
Early incus supplement technique: polythene tubing, bent to 90°
Incudoplasty, Applebaum device. Difficult to site, risk of further incudal necrosis causing “wobble”.

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Incus-stapes incudoplasty prosthesis (titanium).
Titanium incudoplasty, also at risk of further necrosis.
Cartilage neomalleus stut (with Spanner strut-to stapes below).
OSSICULOPLASY
Prognostic Considerations

- **Surgical**: complexity, difficulty
- **Mucosa**: fibrosed, tympanosclerotic
- **Ossicules**: malleus/stapes pathology
- **Tubal insufficiency**
- **External canal**: blunting, obliteration, atresia
OSSICULOPLASTY

Summary

- **Simplicity** – to reduce operative setbacks
- **Versatility** – application to diverse cases
- **Reliability** – in both function and durability