HYDROXYLAPATITE (HA)
COLUMELLAR PROSTHESES
Columellar design. Earlier polyethylene designs using a flat top were prone to tilting, then pressure, sharp edge, or local biomaterial effect under the drum, causing extrusion.
Oval-Top columnellar design. The ovoid shape was designed to adapt to a wedge of the pars tensa, overlying the stapes.

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Oval-Top columnella, longitudinal section showing the shape of the head, intended to mimic the drum curvature.
Oval-Top TORP design. Effect of prosthetic tilt. The curvature avoided local pressure points.

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Oval-Top PORP design. Adaptation to longitudinal tilt.
Oval-Top PORP. Siting on the intact stapes.
Oval-Top TORP. Position on the footplate.
Oval-Top PORP and TORP models. The Teflon shafts permitted rapid and simple length adjustment. (Black)
Universal application of the Oval-Top design, TORP and PORP models. The shafts were interchangeable under a common hydroxylapatite head.
Oval-Top TORP in situ, Rt ear.
Oval-Top PORP in situ, RT ear.
Ova-Top prosthesis evident under the postero-superior pars tensa, Lt ear.
Oval-Top PORP after a trans canal ossiculoplasty.
Oval-TOP PORP. Case of ICW mastoidectomy for an attic cholesteatoma. A small attic defect has been closed with autograft cartilage. Grommet in situ (recent OME).
Oval-Top prosthesis in situ after ICW. Drum repair and extensive attic wall repair with autograft cartilage.
Oval-Top ossiculoplasty outcome after a traumatic chain rupture, Lt ear. Lingering anterior dislocation of the malleus handle evident.
Oval-Top TORP used in a trans-canal drum and chain repair. Severe adhesive otitis necessitated a total drum composite graft.
Radiology showing an oval-top TORP under the tympanic membrane. Rt ear. The middle ear is well aerated, without significant fibrosis.
Left side Oval-Top Torp. Drum thickened, some middle ear fibrosis.
Oval-Top, LT ear, TORP ossiculoplasty. Site free of disease, ear aerated.
Oval-Top TORP in a mastoidectomy reconstruction. A hydroxylapatite canal wall prosthesis is seen laterally. The middle ear shows adhesions but is partially aerated.
Hybrid hydroxyapatite-titanium columella (Dornhoffer), grooved to permit use as an indirect (L-strut) assembly. Cartilage overlay prudent if used as a columella.
Grooved Dornhoffer hydroxylapatite columella/assembly model, adaptable to either PORP or MSA roles.
Dornhoffer footplate stabilisation device, designed to prevent footplate “skid” or other displacement of the medial end of the TORP model. The notches adapt to remaining crural stumps.
An Oval-Top prosthesis compromised by chronic tubal insufficiency. Severe total drum retraction present, despite Silastic sheeting in the middle ear, visible behind the drum.
Recurrent cholesteatoma, after an Oval-Top ossiculoplasty. The drum is invaginating between the malleus handle and the prosthetic head, into the attic.
Gross pars tensa collapse and extrusion of an Oval-Top TORP. Chronic tubal insufficiency is a major cause of failed ossiculoplasty.
Severe drum retraction due to chronic tubal failure, post-ICW surgery. The Oval-Top TORP is draped with fine squamous epithelium but without rupture.
Drum breakdown due to virulent infection. Oval-Top PORP exposed, later removed.
Severe displacement of an Oval-Top PORP. The device has toppled onto its side. The drum remains intact.
Marked toppling of an Oval-Top PORP, ICW case complicated by severe tubal insufficiency.
Toppled Oval-Top PORP subsequent to a tympanoplasty.
Extrusion of an Oval-Top prosthesis. The process is frequently a dry “mummified” occurrence, possibly partially avascular action.
Gradual extrusion of a hydroxylapatite head, evidently without infection.
Fully extruded Oval-Top TORP, lying in the EAC, 13 years after surgery.