

OSSICULOPLASTY: AUTOGENOUS OR BIOMATERIALS?

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Incus defect or incudomalleal blockage

- Often Long process of incus is lacking
- Following years of retraction pocket
- Continuity maintained for years (thin osseous bridge, sometimes fibrous with direct contact between stapes and tympanic membrane)
- Auditory alteration can be mild : myringo-stapedopexie
- But diastasis between incus and stapes with normal tympanic membrane is frequent

In which case should we operate?

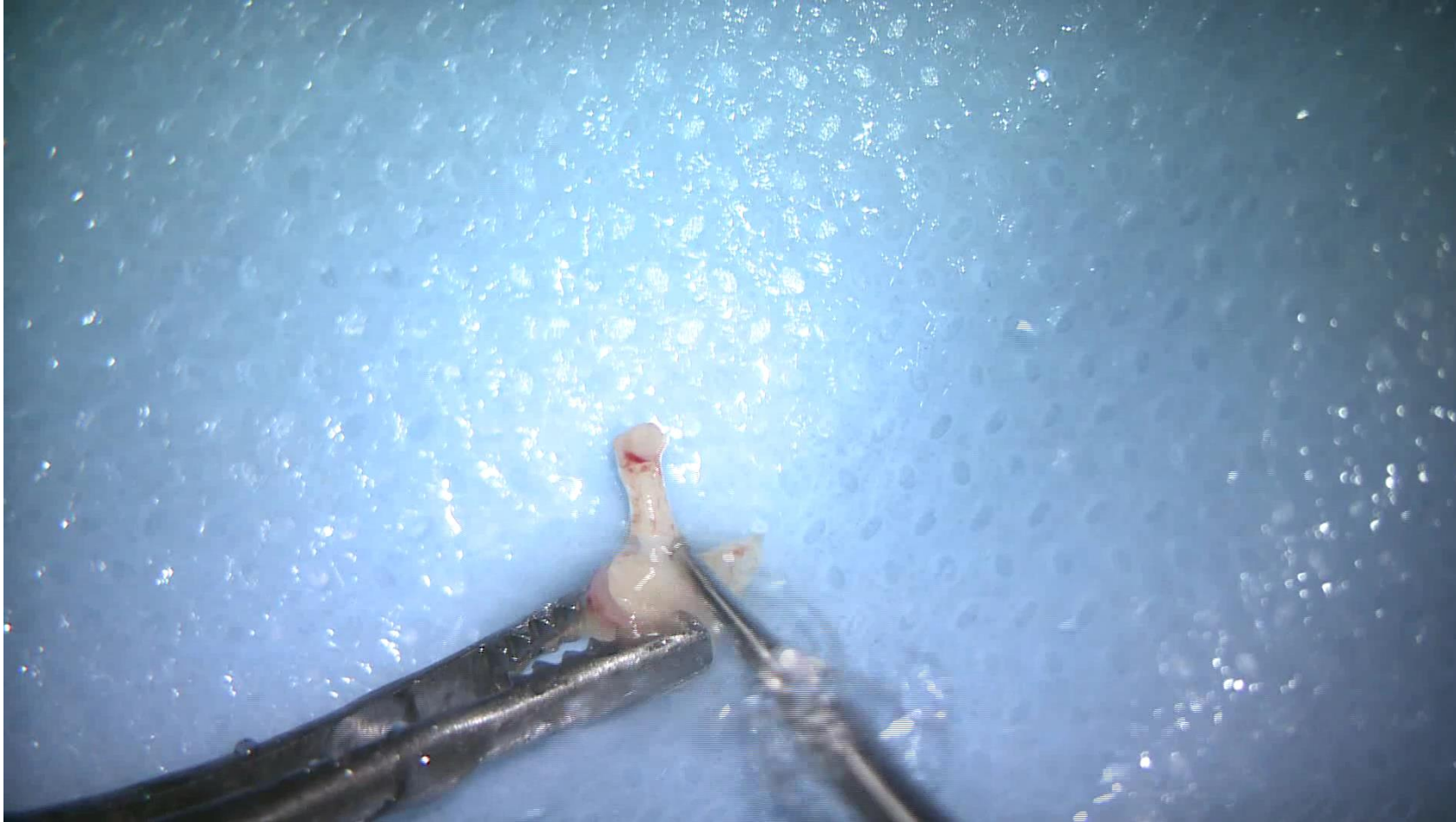
- In case
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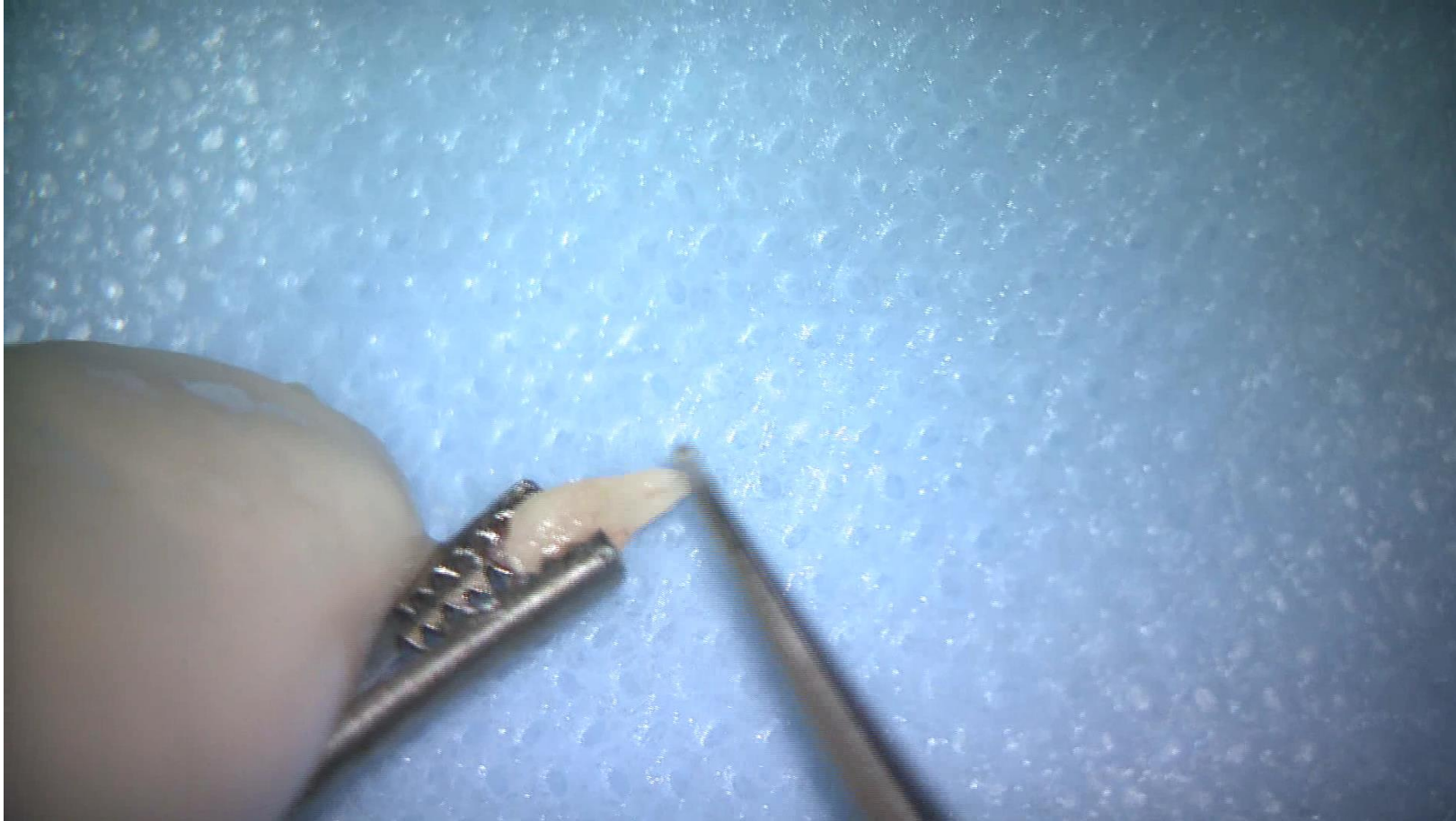


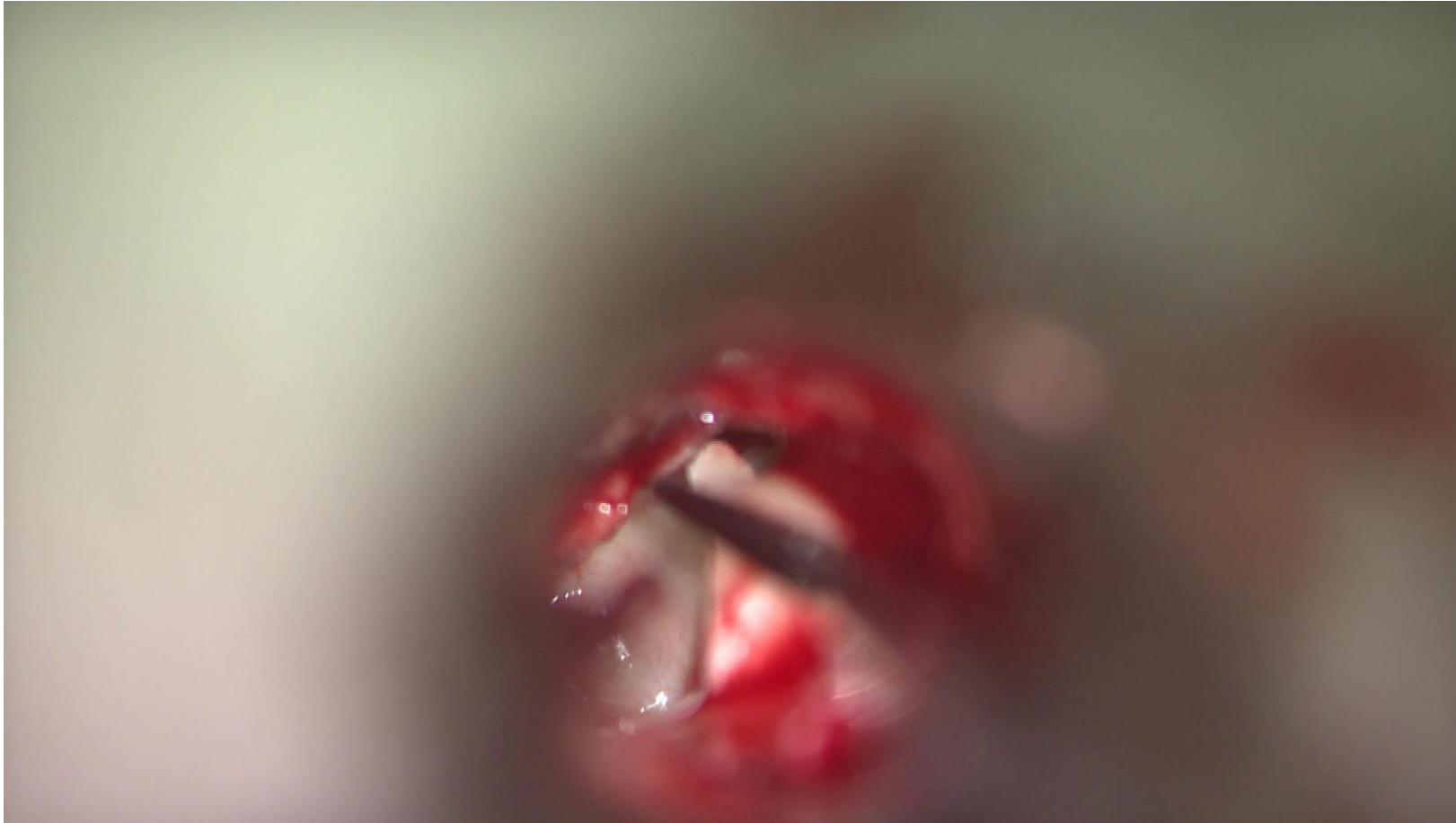
Which surgical procedure?

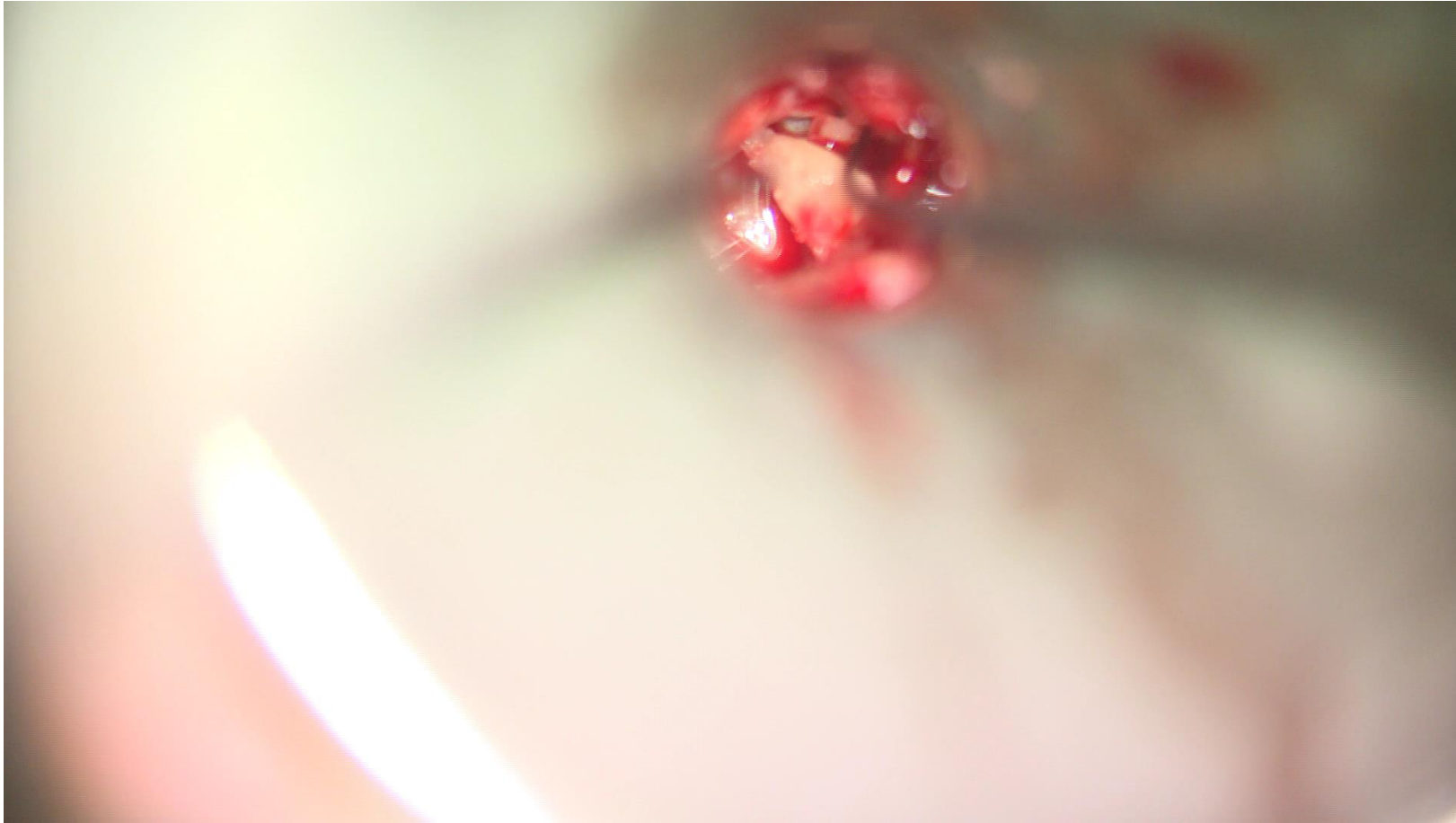
1. ossicular transposition: body of incus, head of malleus, (piece of cortical bone)
2. PORP (TORP)
3. Taqucartilage plate
4. Ciment

Incus transposition









PORP: one example



The screenshot shows the KURZ website interface. At the top left is the KURZ logo. The navigation menu includes: > Products > OTOLOGY > TYMPANOPLASTY > TTP-VARIAC Titanium... On the right, there are links for e-catalog, Clinical Evidence, MR Information, a language dropdown set to DE, and a search icon. Below this is a secondary menu with Products, Company, News, and Contact. A phone icon is visible in the bottom right corner of the header area.

TTP-VARIAC SYSTEM

TTP-VARIAC Partial Prosthesis

ADJUSTABLE LENGTH PROSTHESES

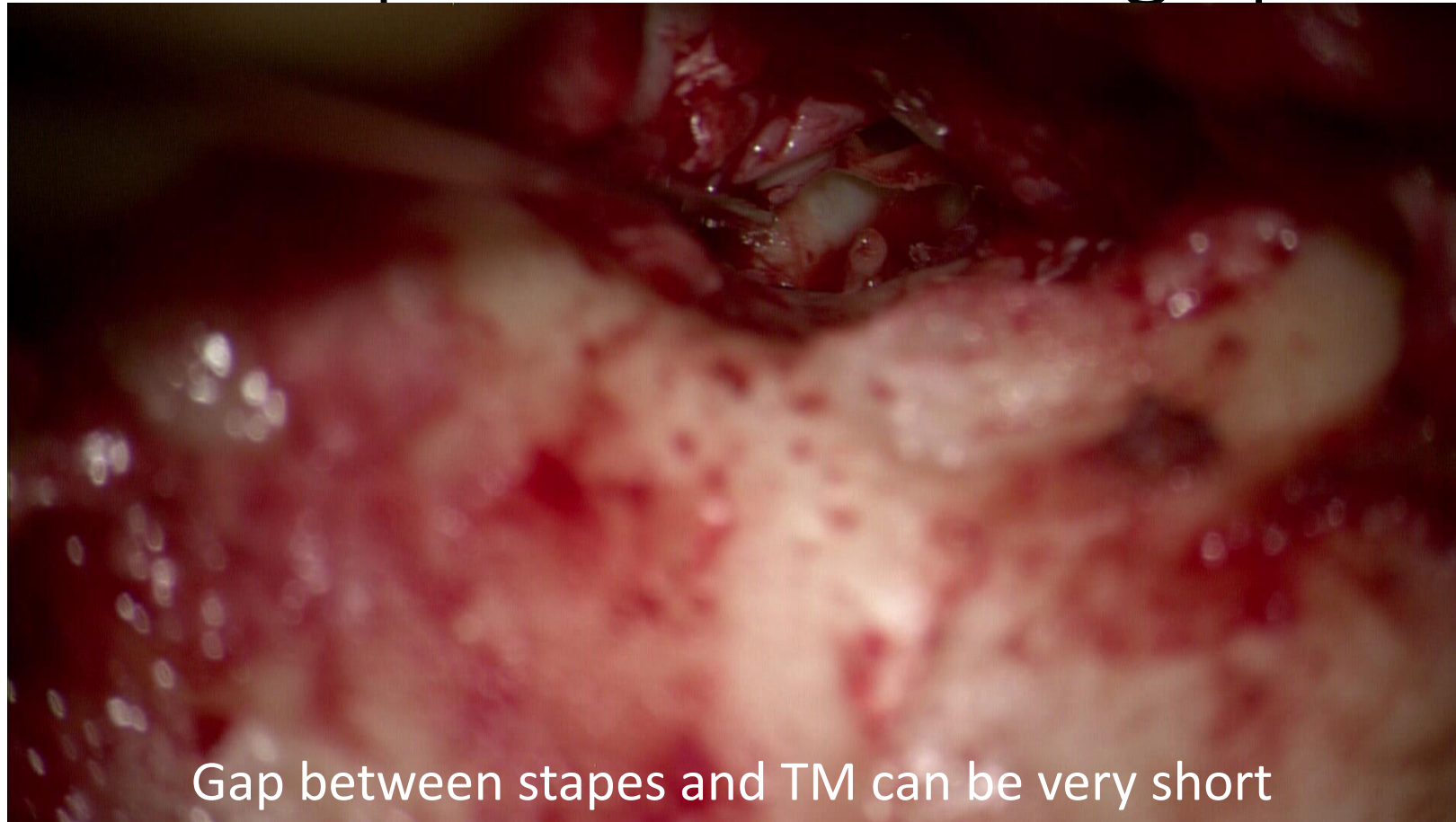
- Fine, elegant design
- Fenestrated head plate
- Partially roughened surface
- Pure titanium
- Finely balanced weight distribution
- MR conditional for the future: 7.0 Tesla

The product images show a silver-colored partial prosthesis with a circular head plate and a blue-colored fenestrated head plate. Both images have a red plus sign icon overlaid on them. To the left of the images is a vertical list of nine circles, with the top one filled with orange, indicating the current selection.

Comparisons: PORP vs transposition

- For some, incus transposition is better
 - Amith et Rs 2017: ABG<20dB 65% vs 35% et plus d'extrusion
 - Ceccato et al 2005 même si ABG<20dB est similaire 62% vs 61%
- For others autogenous ossiculoplasty has several disadvantages :
 - Risk of acoustic bridge due to ossification between the transposed ossicle and neighbouring osseous structures
 - Risk of ossification between stapes and the transposed ossicle that can preclude safety of revision surgery
- PORP can be easily placed and removed and never ossifies but can spontaneously extrude (cartilage plate cover mandatory)
- **Both techniques require sufficient distance between stapes and TM**

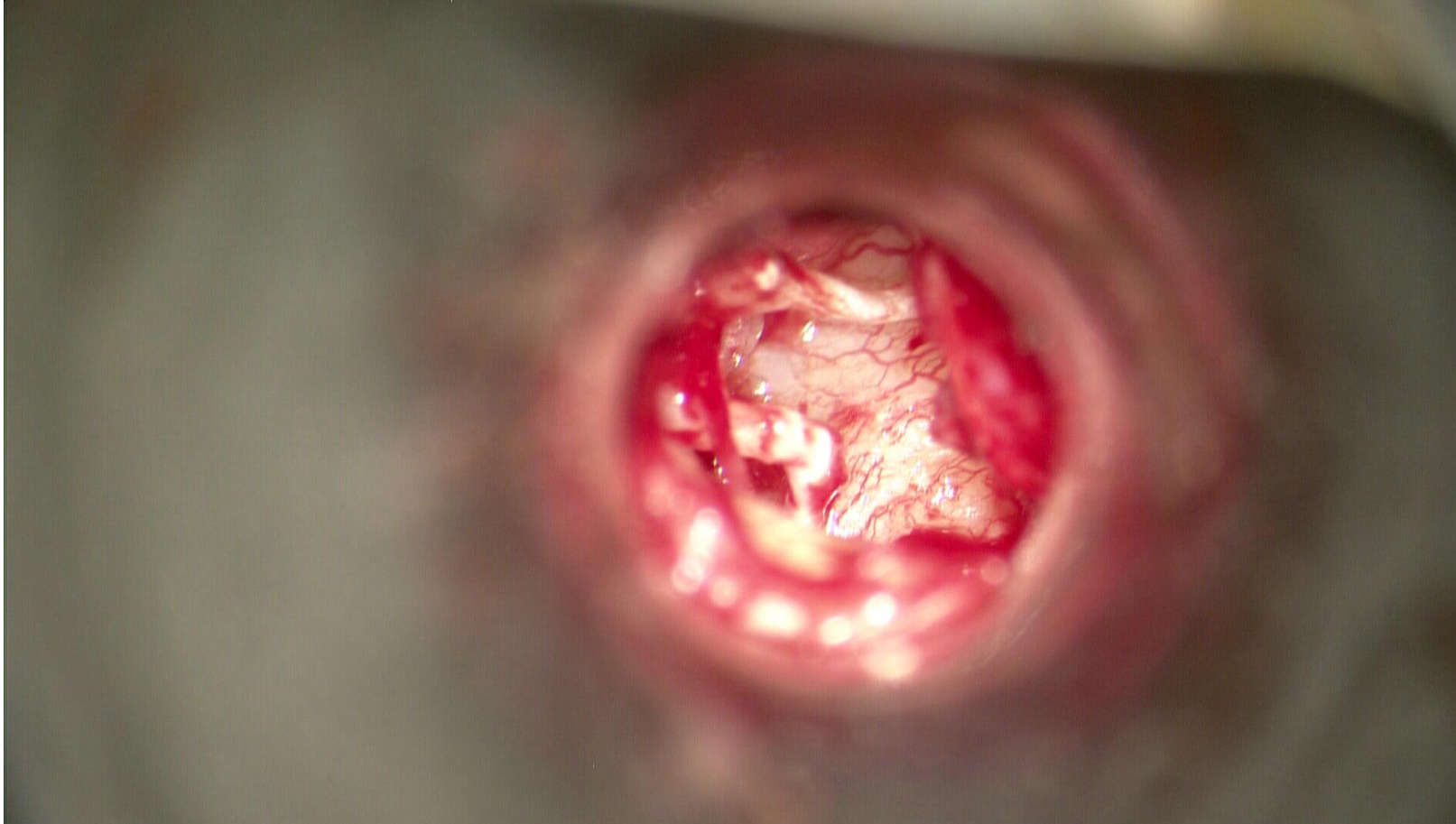
Alternative procedure: cartilage plate



Résultats comparatifs, cartilage vs PORP

- Cartilage plate 67,6% of patients $ABG \leq 20$ vs PORP 70,4% (Quérat et al 2014) – No extrusion of PORP in this series
- PORP: 61% $ABG < 20$ dB (Ceccato et al 2005)
- PORP CAN BE EXTRUDED (Ceccato et al 2005 et Amith et Rs 2017)

Ciment (Otomimix)



Functional Results

- Ciments with fiberglass and hydroxyapatite
 - Neural toxicity possible (aluminium), surface perfectly dry, with no mucosa left
- Ciments with hydroxyapatite (Otomimix): very well tolerated, accept humidity and mucosa
- Otomimix: ABG<20dB : 95% for diastasis of incudo-stapedial joint (Gérard et al, 2015)
- Fiberglass Ciments (in particular in children): improvement of Rinne. ABG<20dB : 70% (Gungor et al 2016)

CONCLUSIONS

- Three points to be considered:
 - Importance of GAP between incus and stapes,
 - distance between TM and I stapes
 - (likelihood of revision)

	small diastasis ($\leq 1/3$ short process of incus)	Big diastasis
Rétraction of TM	PLATE of CARTILAGE	Plate of CARTILAGE
Distance TM-Stapes normale	CIMENT	PORP – TRANSPOSITION

Very good result can be expected: ABG < 20dB in about 2/3 of cases

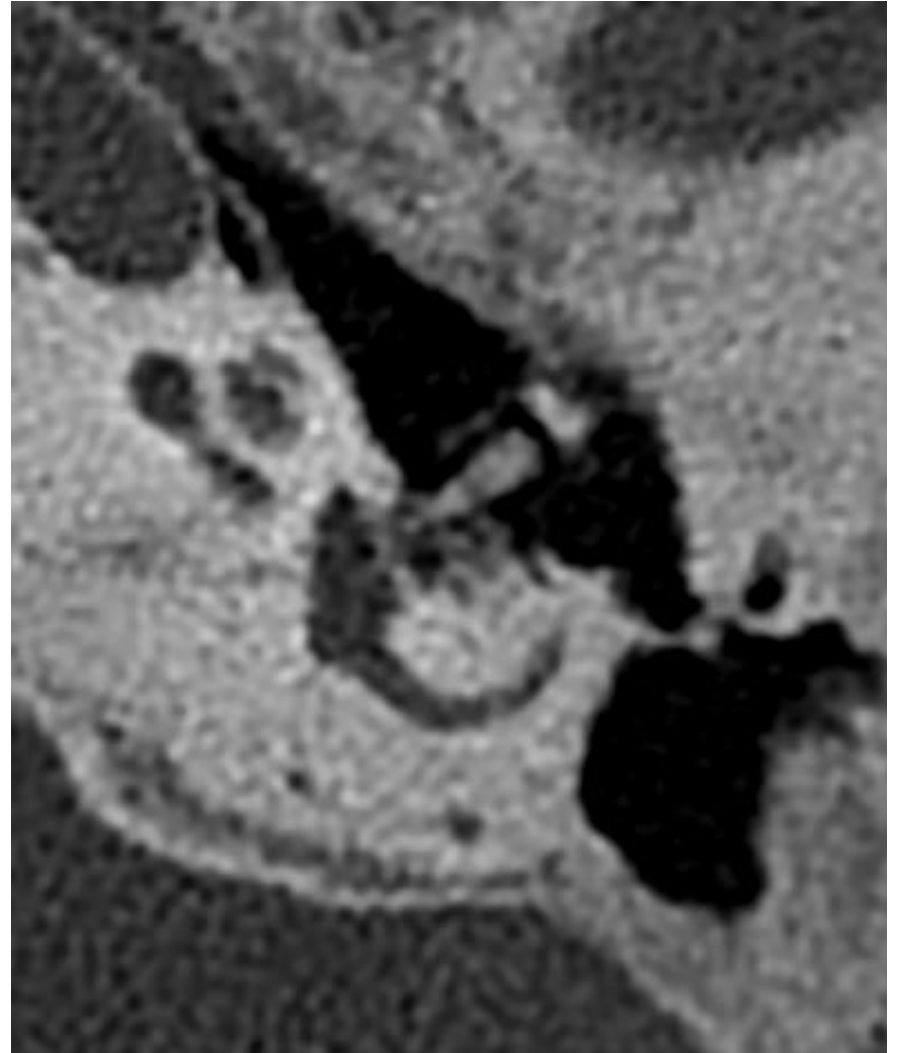
Total ossicular replacement TORP or autologuous ossiculoplasty?

- First question: which technique gives better results?
- Second question: which technique is safer in the long term?
- Second question: will it be necessary to achieve a revision surgery?
(cholesteatoma)

ABSENCE OF STAPES FOOTPLATE MOBILE

- TORP
- AUTOLOGUOUS OSSICLE USED AS A TORP:
risk of ossification to the footplate

IF NO TORP AVAILABLE, INTERPOSE FASCIA
GRAFT BETWEEN STAPES FOOTPLATE
AND OSSICLE



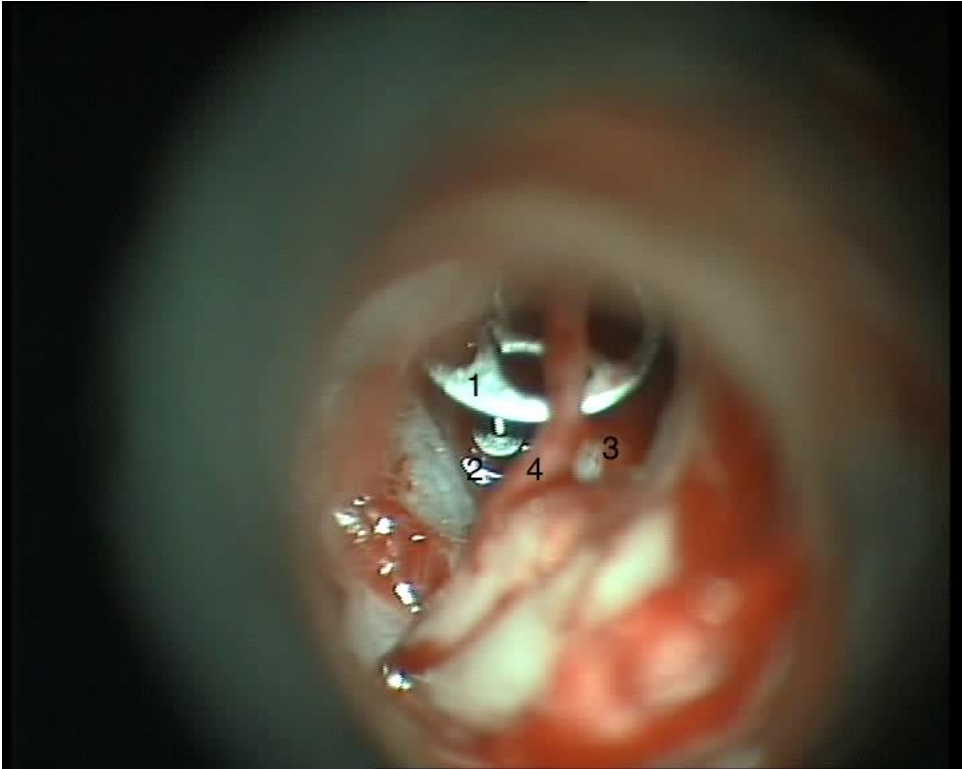
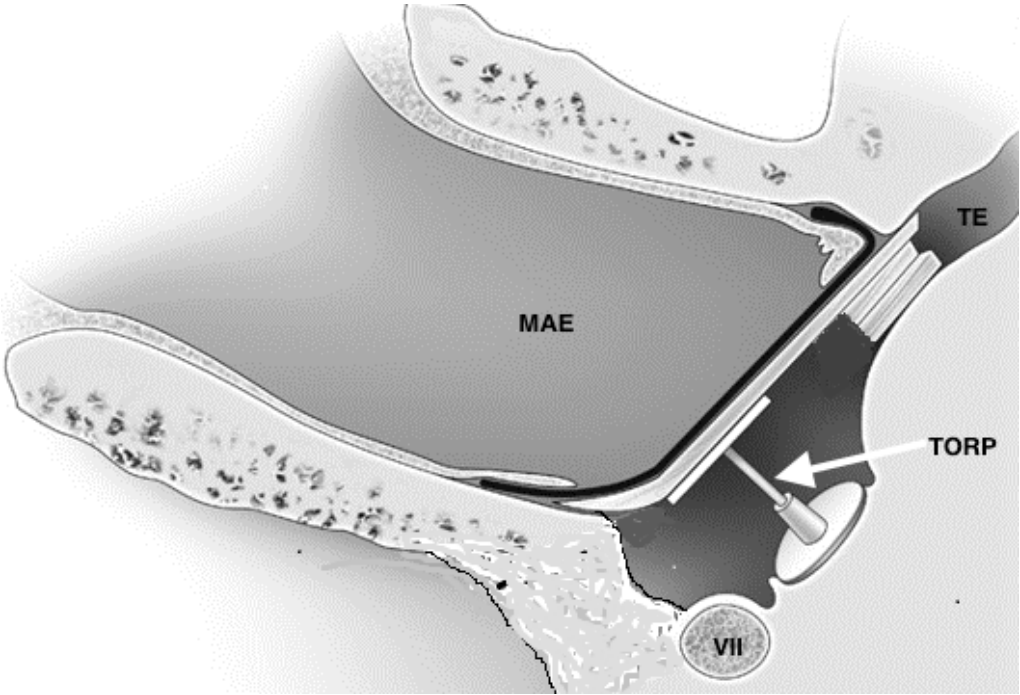
TORP

- SEVERAL MATERIALS:

- **TITANIUM** IS VERY WELL TOLERATED, non ferro-magnetic, easy to place and to remove



TECHNIQUES

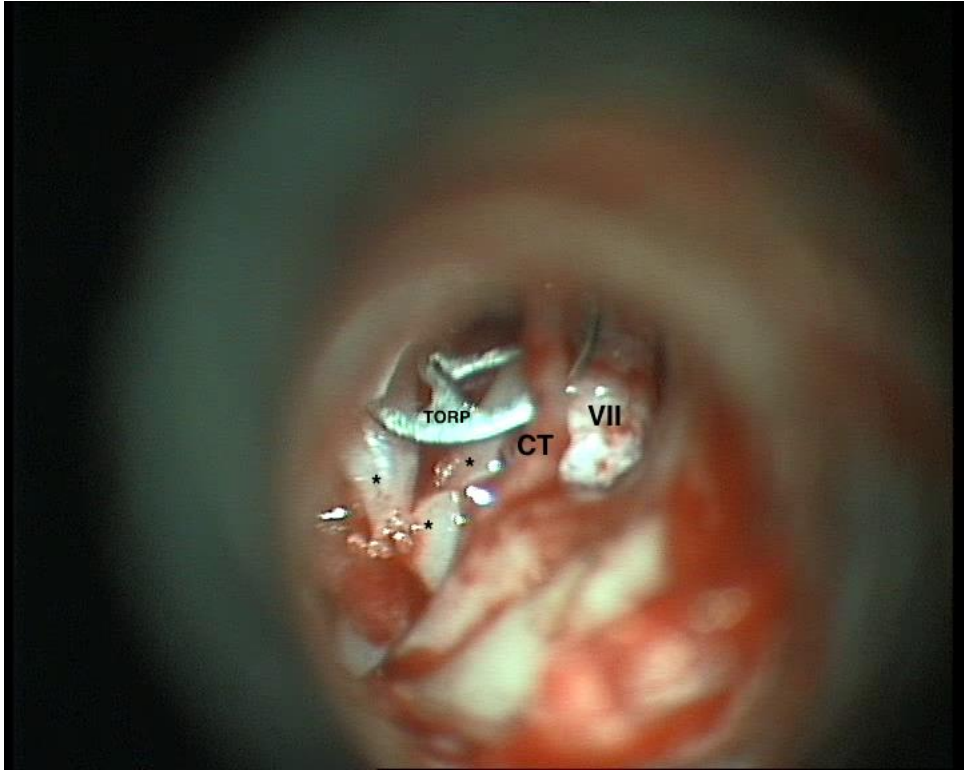
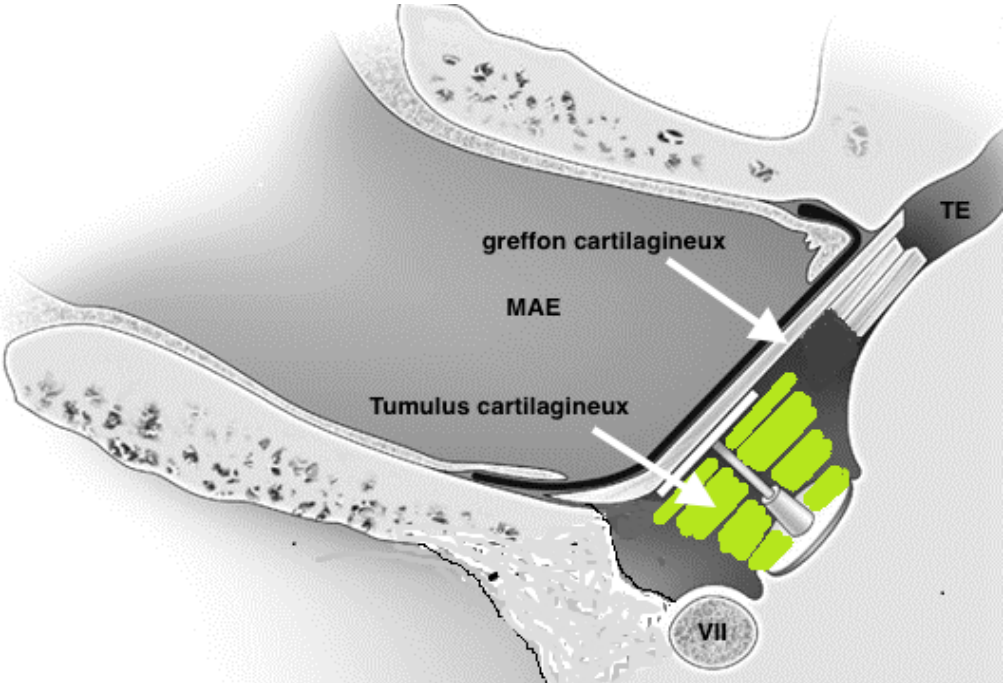


COVERING THE PLATE OF TORP WITH CARTILAGE TO PREVENT EXTRUSION

What about stability of TORP?

- Nothing: flat footplate, and large foot of TORP
- Gelitaspon
- Tumulus: with autologous cartilage: also prevent intravestibular migration

TUMULUS



TORP in chronic otitis

- Consider tympanic retraction and risk of intra vestibular migration : UNDERCORRECT the height of TORP
- Never place a TORP in the same surgery if the foot plate has been broken



CONCLUSION

- FOR TORP: VERY GOOD RESULTS AND EASILY REMOVABLE IN CASE OF REVISION; UNDERCORRECT THE HEIGHT OF TORP AND COVER IT WITH CARTILAGE
- AUTOLOGUOUS OSSICLES CAN BE EFFECTIVE, BUT RISK OF OSSIFICATION TO FOOTPLATE: IF POSSIBLE PREFER TORP, IF NOT INTERPOSE A FASCIA GRAFT BETWEEN FOOTPLATE AND OSSICLE
- IF BROKEN FOOTPLATE, STAGE SURGERY AND USE TUMULUS CARTILAGE TO PREVENT INTRAVESTIBULAR MIGRATION