

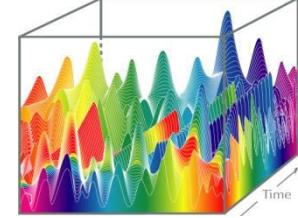
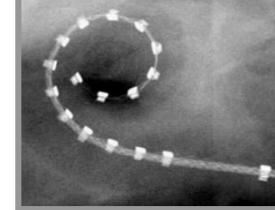
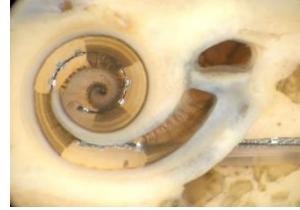
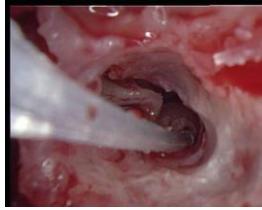
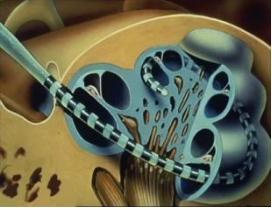
# COCHLEAR IMPLANT IN DIFFICULT CASES situations and surgical procedure



toulouse  
june 2015

Abdelhamid BENGHALEM  
[benghalem@benghalem.ma](mailto:benghalem@benghalem.ma)

Centre d'Implantation Cochléaire Rachidi



## definitions and GOALS

- \* difficults situations
- \*Surgery in difficults cases baby / children and adult/ anatomical abnormalities
- \*techniques peculiarities :
  - minimal invasive
  - surgery in very young children
  - how to manage difficulties

# AGE / ANESTHESIA

## High risk anesthesia

- the problems:

- Adequate material: intubation tube, pediatric respirators low flow,

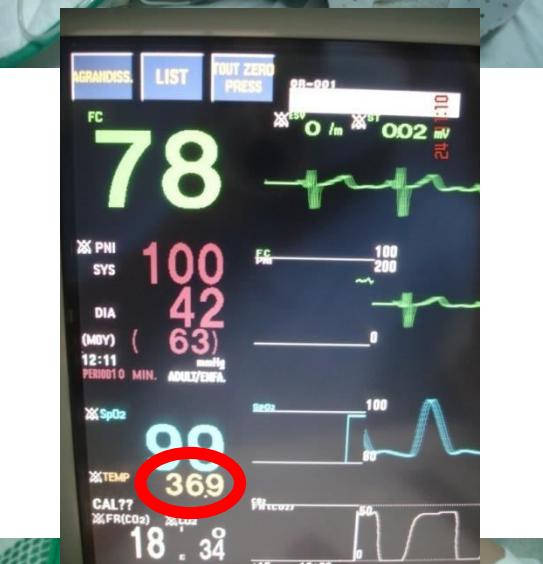
- Veinous acces

- HYPOTHERMIA first ½ hour

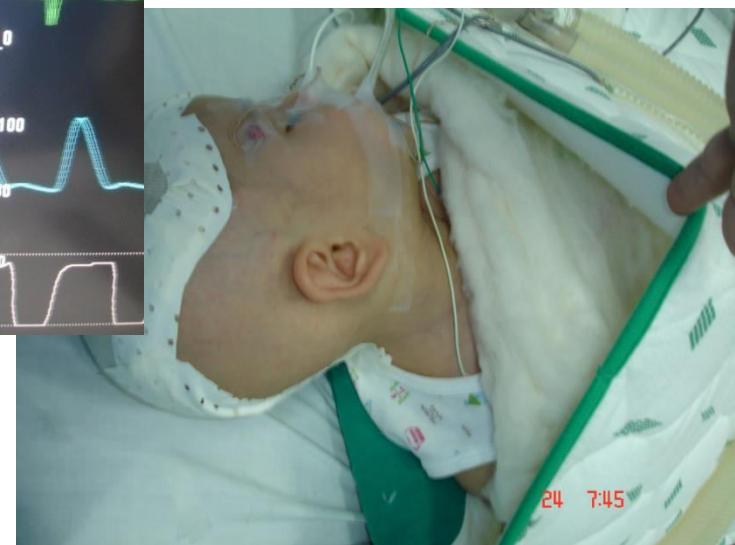
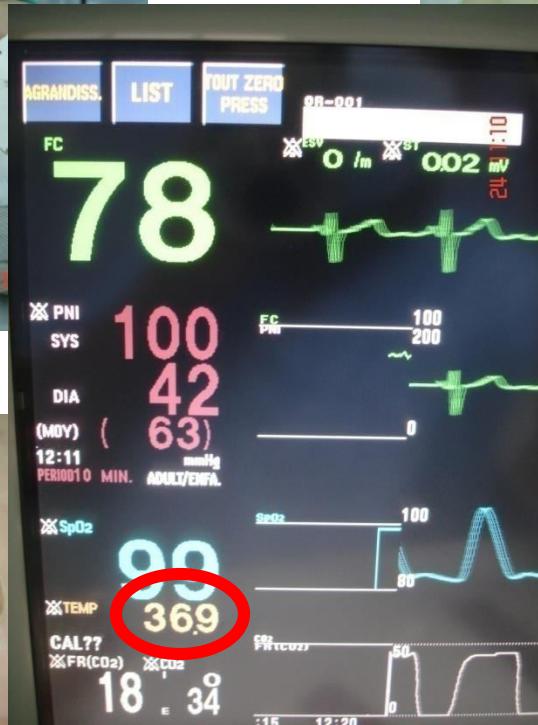
- everything must be warmed
    - even fluids and perfusion

- PER OPERATIVE MEASURMENTS

- VERY SMALL VOLEMIA



# AGE / ANESTHESIA



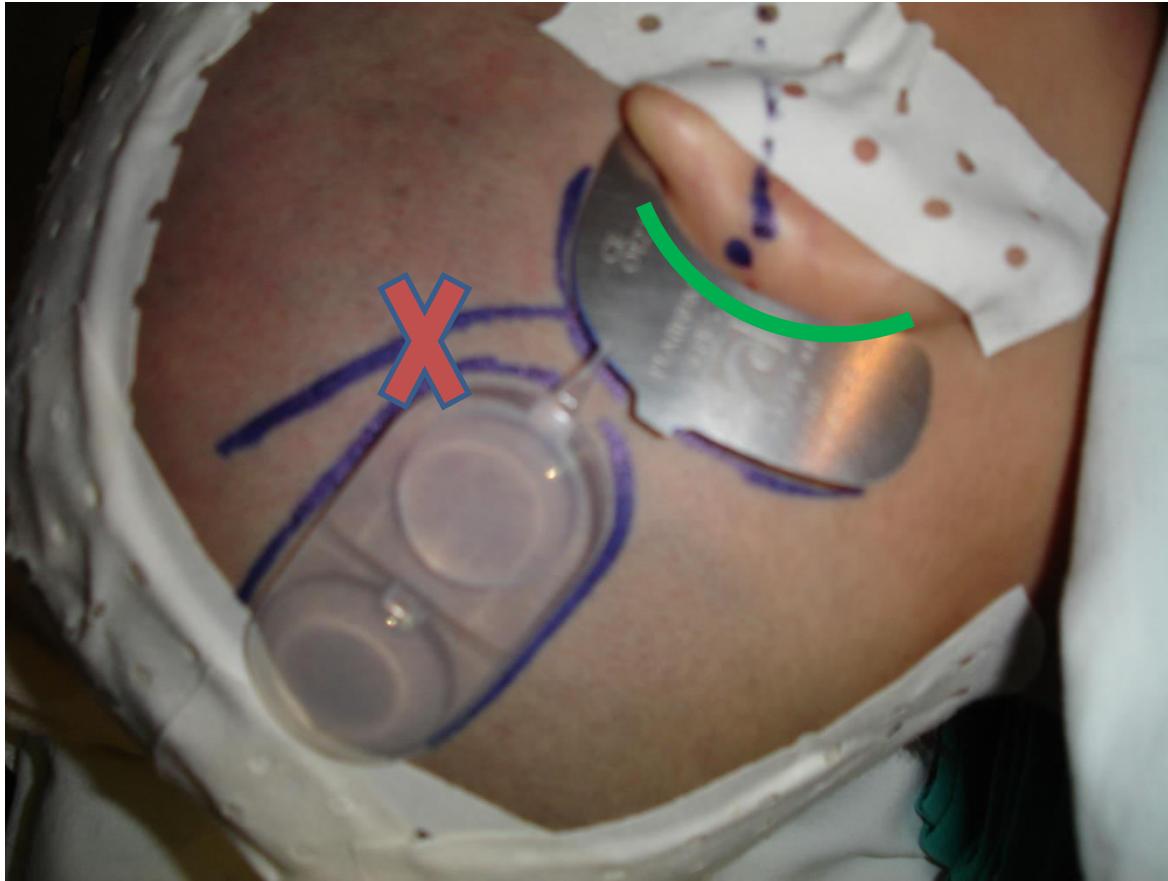
# Bilateral simultaneous implantation in very young children



# Bilateral simultaneous implantation in very young children



# MINIMAL INVASIVE APPROACH



# MINIMAL INVASIVE APPROACH

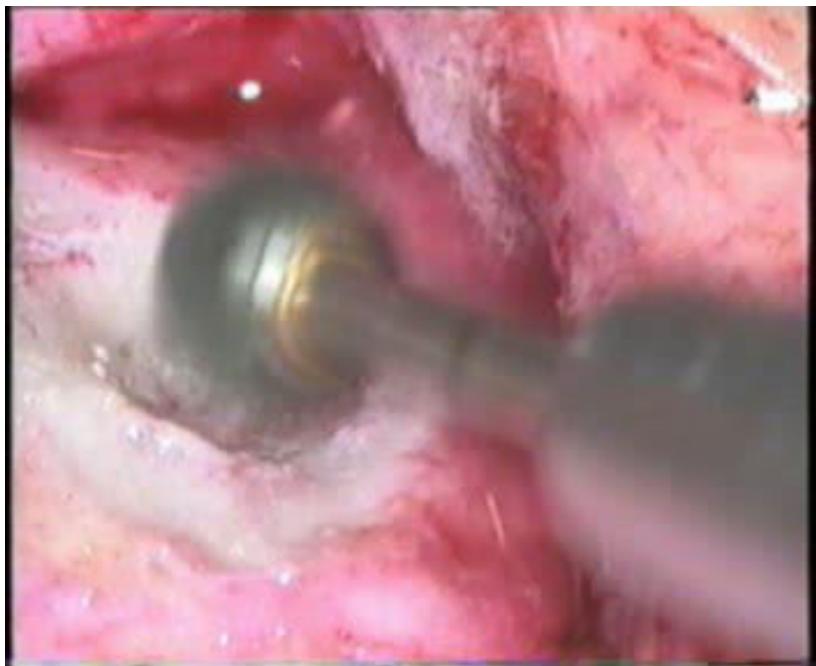
## approach

- Rigourous hemostasis
- Bipolar
- Switch of monopolar coagulation



Minimal invasive surgery

- Mastoid

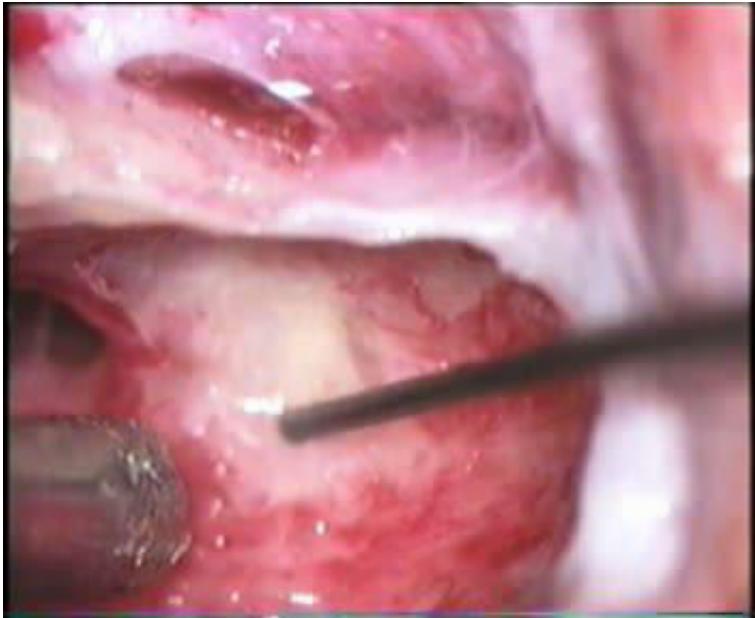
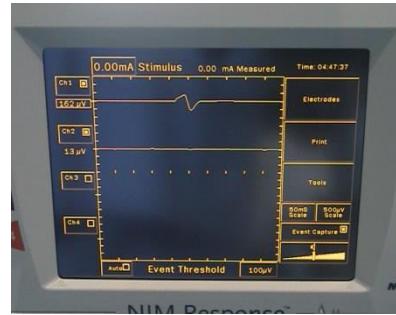


14 months

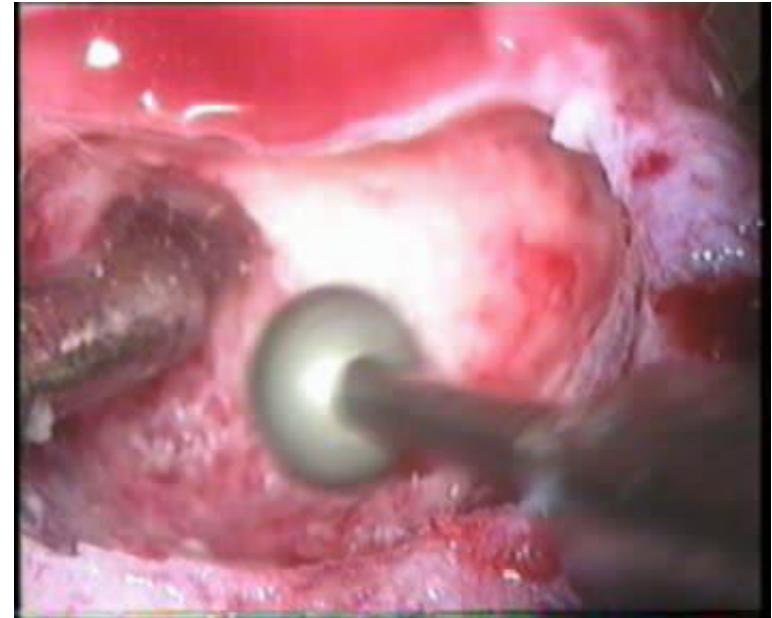


5 years

- Posterior Tympanotomy
- FACIAL NERVE MONITORING



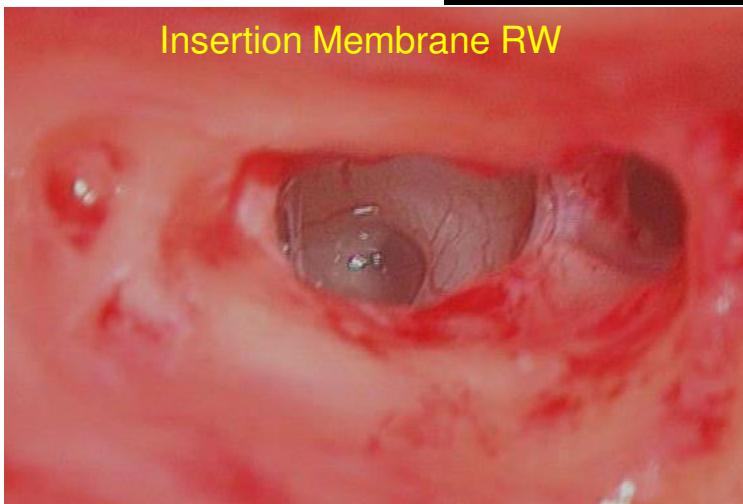
14 months



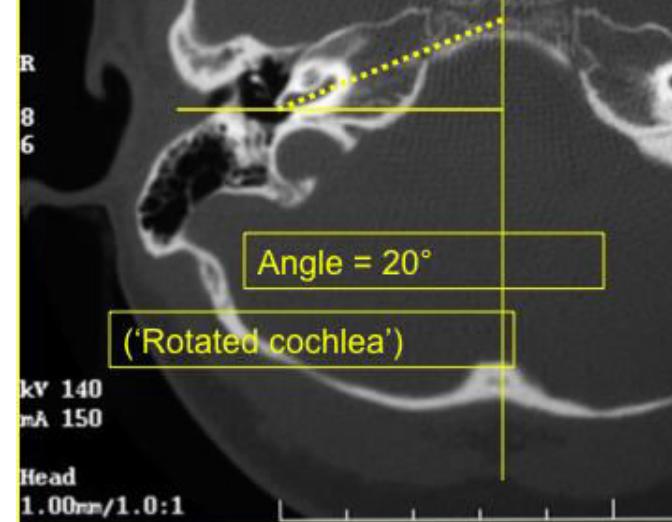
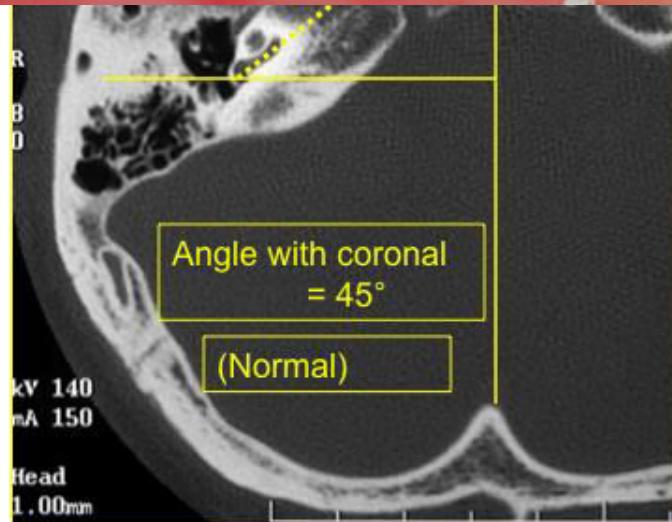
5 years

# RW POSITION

Insertion Membrane RW



Cochleostomie promontoire



Angel RAMOS/C.CENJOR

# COCHLEOSTOMY RW/PROMONT

## COCHLEA

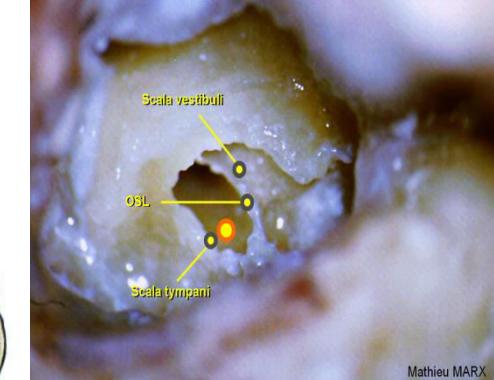
mature size

Orientation

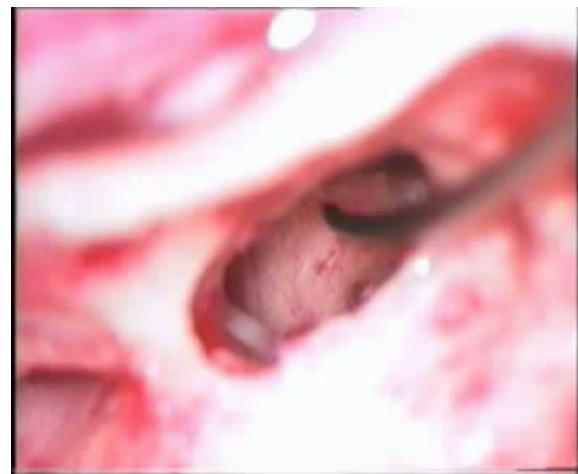
hypotympanum cells

Accessibility to RW

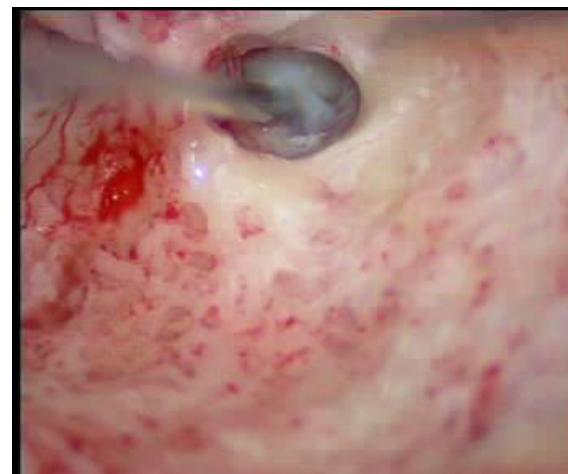
Scala tympani insertion



Cochleostomy



RW Bony bridge



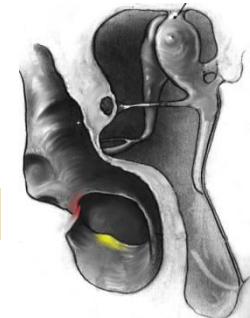
NICHE



Left side



Crista fenestra

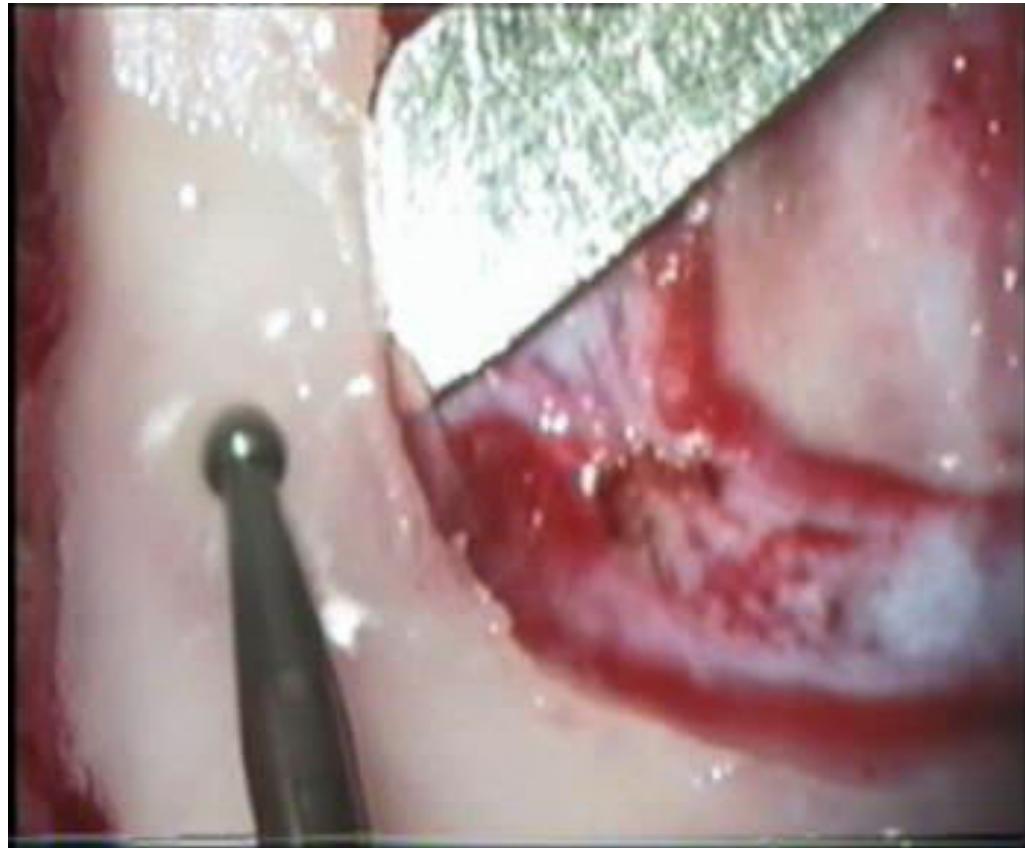




clinique ONO RACHIDI

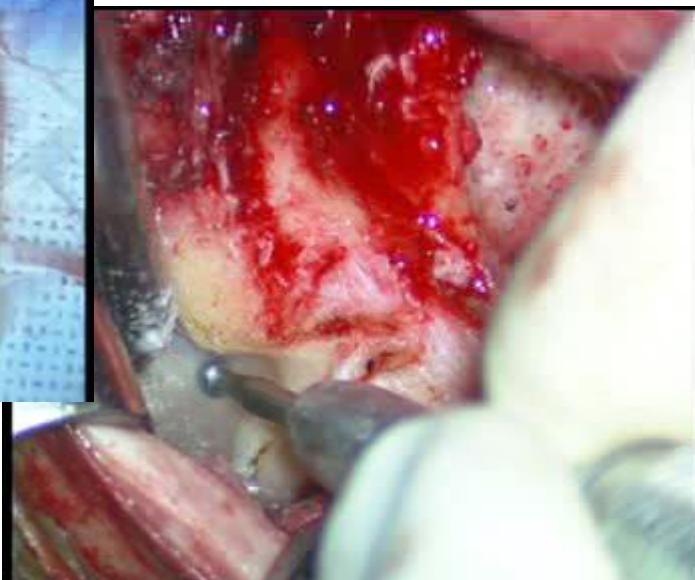
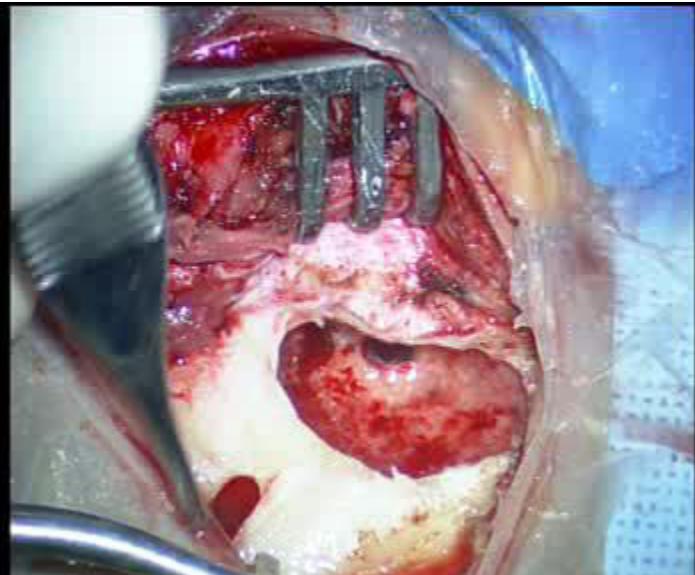
# FIXATION

- Corticale temporale / ~~FIXATION~~



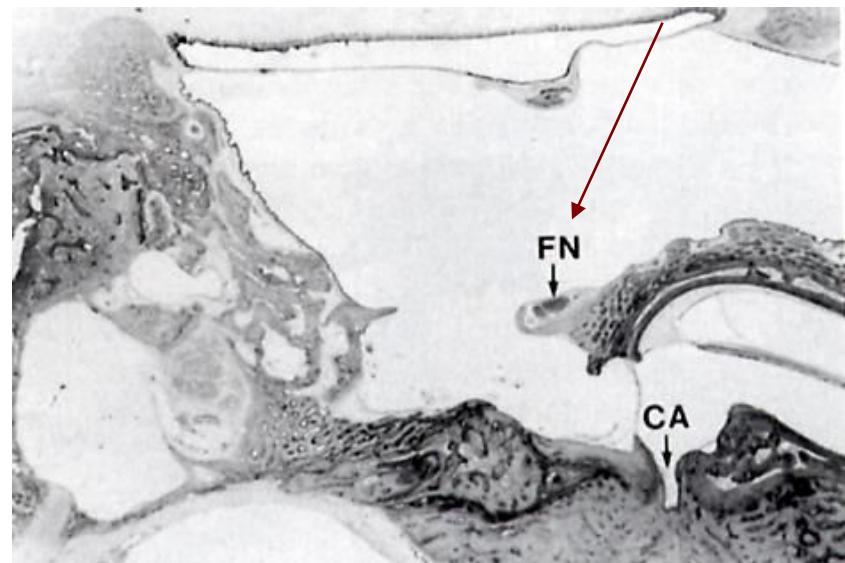
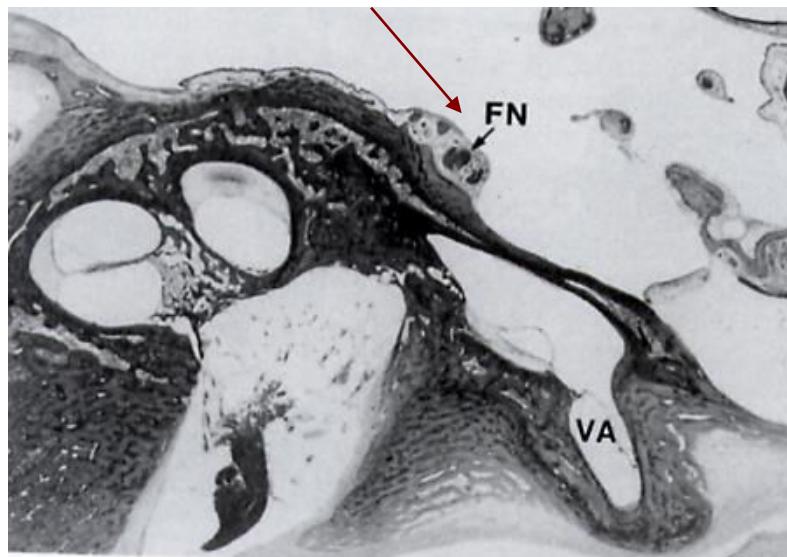
# FIXATION

- NICHE+TUNNEL



# Aberrant Facial nerve

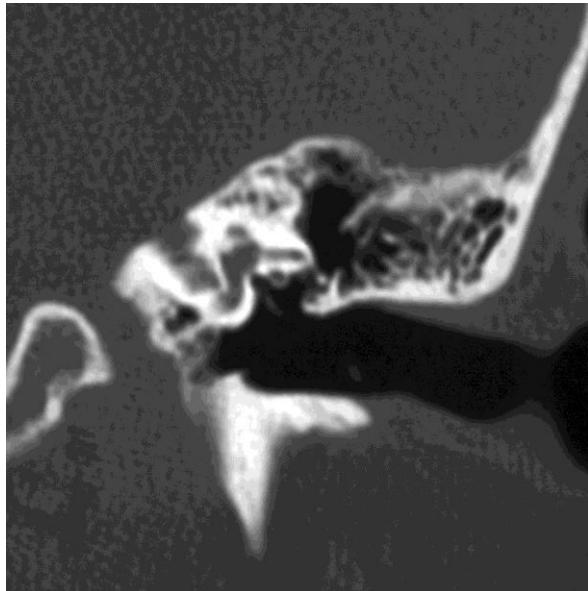
- aberrant congenital malformations
- difficult identification



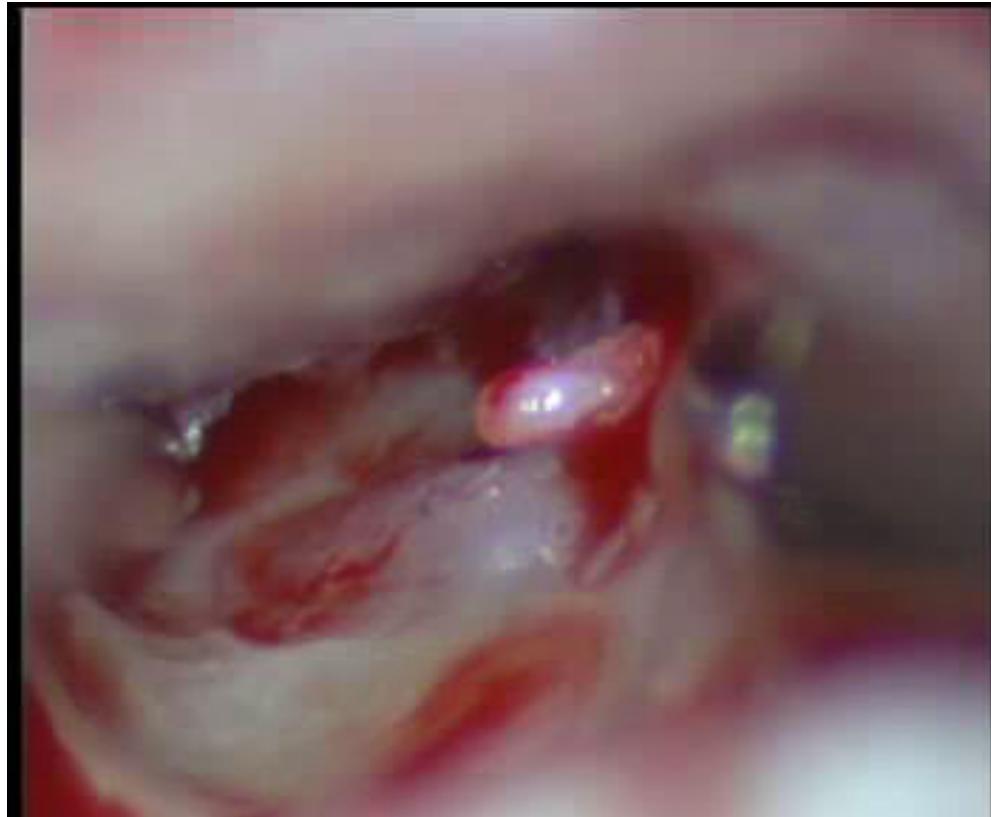
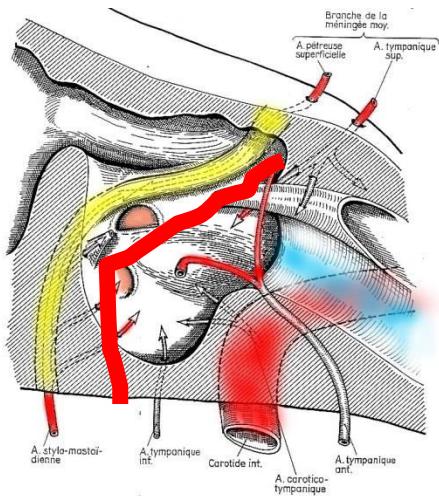
# facial aberrant

## HOW TO MANAGE

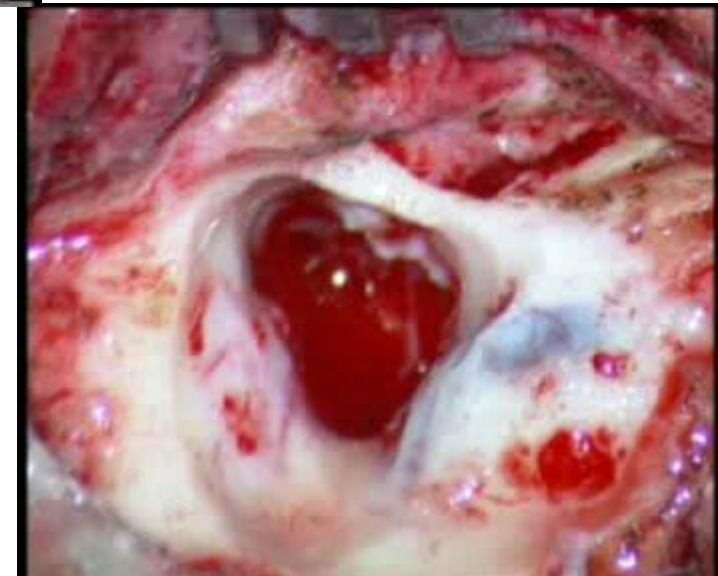
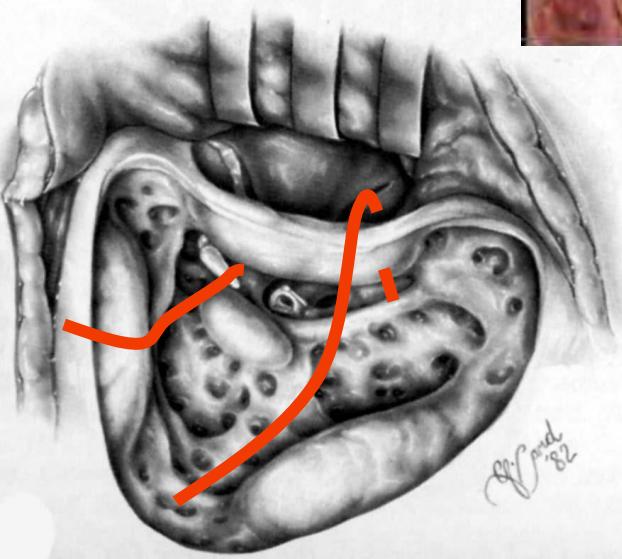
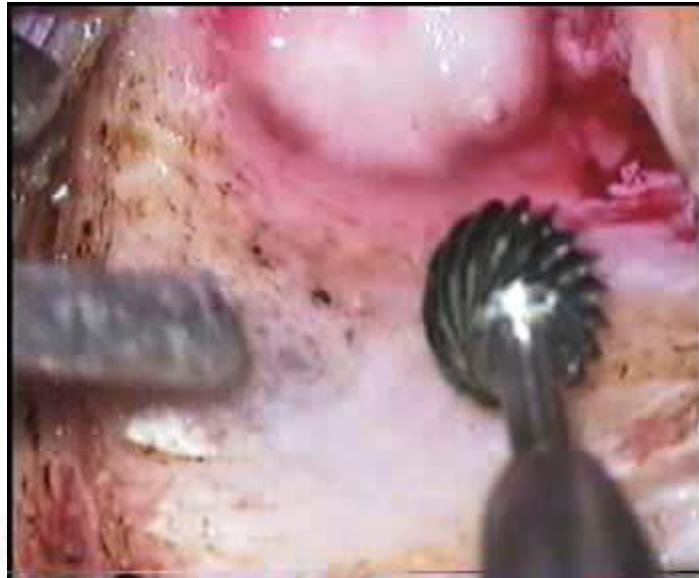
- monitoring difficult cases NIM  
( Congénital malformations )



# facial aberrant, RW obstructed



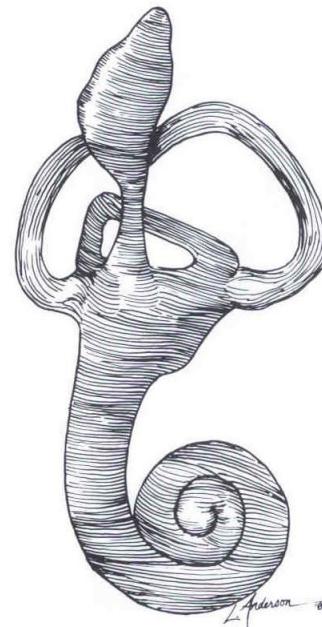
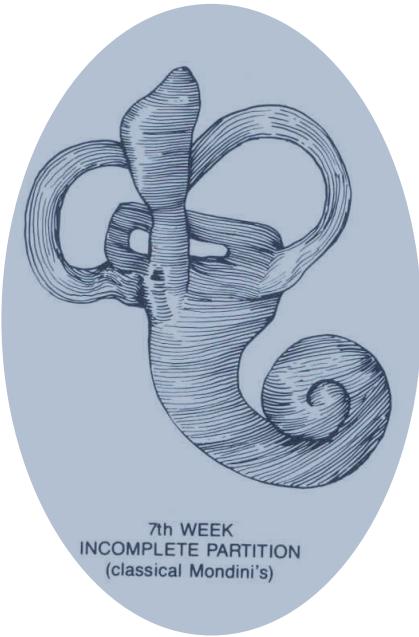
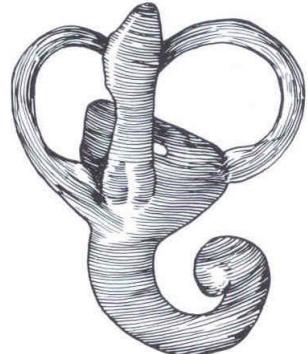
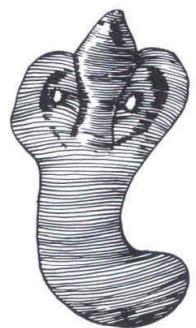
## LATERAL SINUS PROCIDENT



# Congenital Malformations

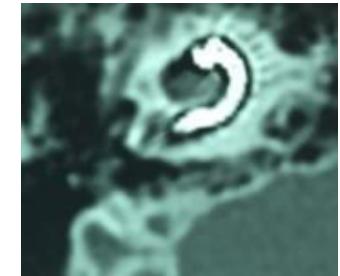
## Classification

- Model of arrested development
- Abnormalities are determined by point at which development stops



# Congenital Malformations Classification

- **Michel deformity:** Complete absence of all cochlear and vestibular structures
- **Cochlear aplasia:** The cochlea is completely absent
- **Common cavity:** Cystic cavity representing the cochlea and vestibule without any differentiation into cochlea and vestibule
- **Cochlear hypoplasia types 1,2:** Dimensions smaller than normal. Malformation is further differentiated so that the cochlea and vestibule are separate from each other. No modiolus.
- **Cochlear hypoplasia type 3:** Dimensions smaller than normal. Shorter modiolus. Cochlea less than 2 turns.
- **Incomplete partition type I (IP I):** Cochlea is lacking the entire modiolus and cribriform area
- **Incomplete partition type II (IP II) or Mondini deformity:**
  - The cochlea consists of 1.5 turns
  - **Middle and apical turns coalesce to form a cystic apex**
  - Dilated vestibule and enlarged vestibular aqueduct (EVA LVAS)
- **Incomplete partition type III (IP III) or X-Linked Deafness:** Interscalar septa are present but modiolus is completely absent



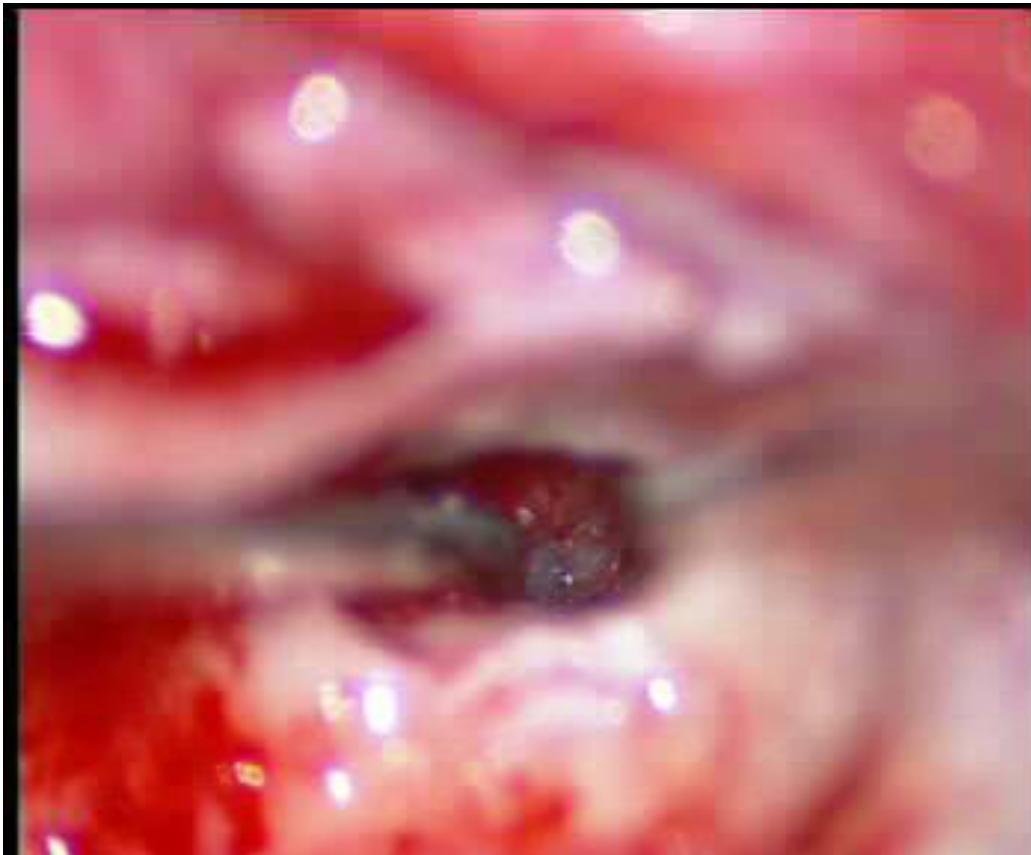
Sennaroglu L, Saatchi I., A new classification for cochleovestibular malformations, The Laryngoscope, 2002

Sennaroglu L, Sarac S, Ergin T, Surgical Results of Cochlear Implantation in Malformed Cochlea, O&N, 2006

Sennaroglu L, Cochlear implantation in inner ear malformations – a review article, CI International 2010

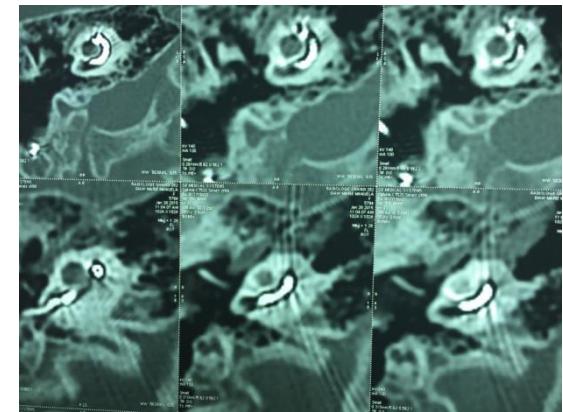
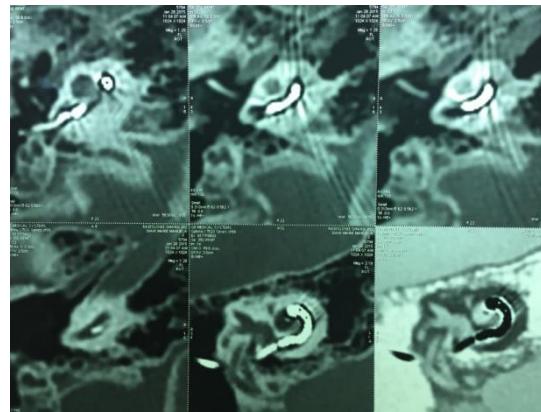
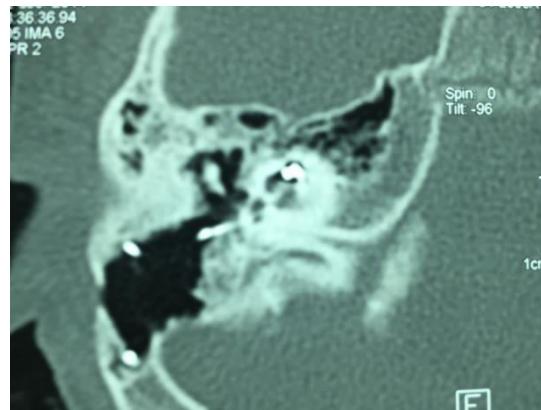
# GUSHER

**8 cases / 463 CI  
3 massive  
5 minor**



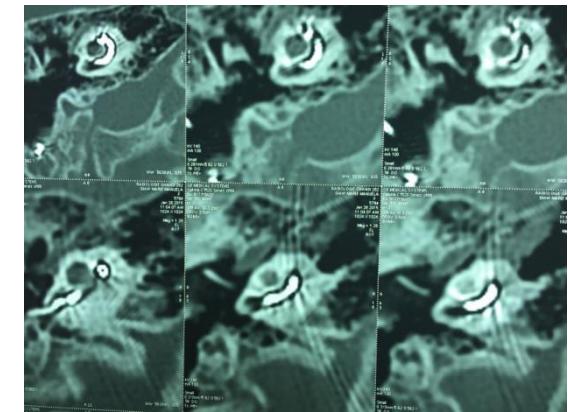
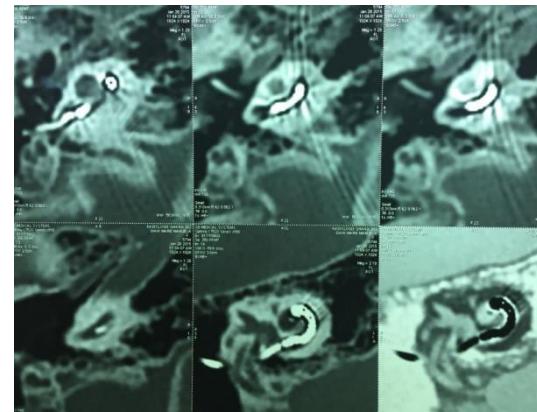
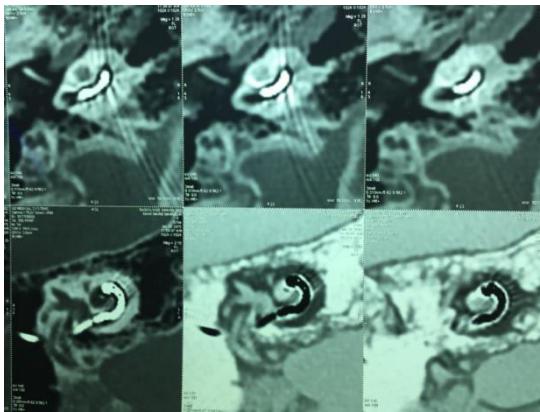
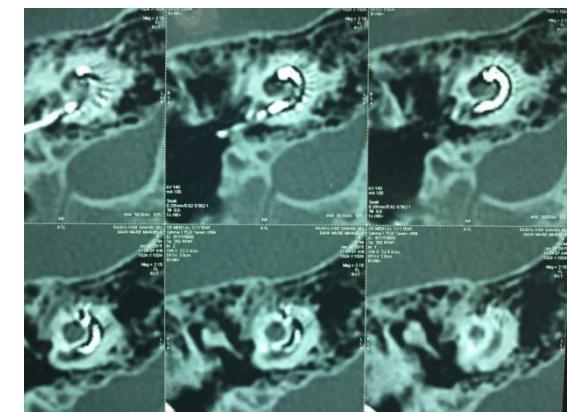
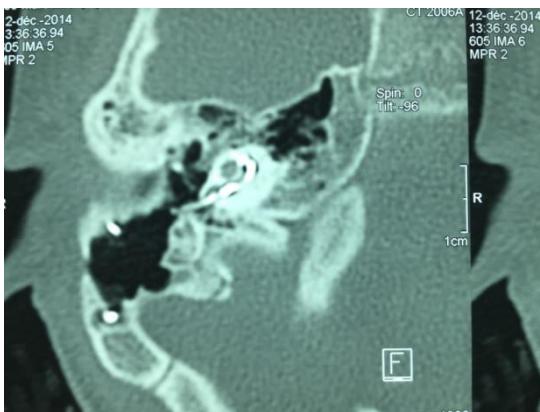
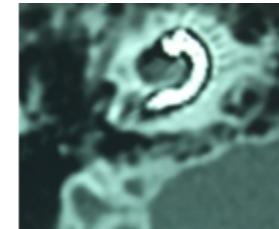
# Imagerie

- Une fille âgée de 3 ans
- Etiologie: Surdité profonde bilatérale
- pas de performances

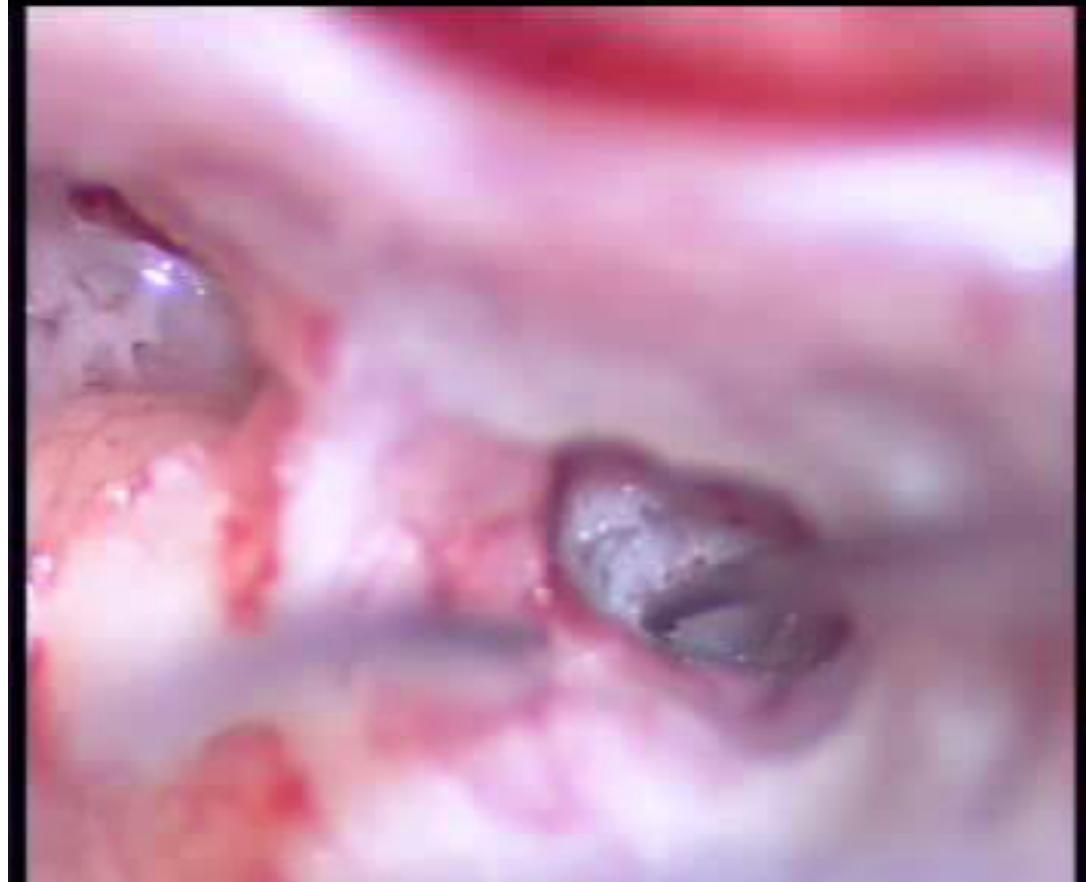
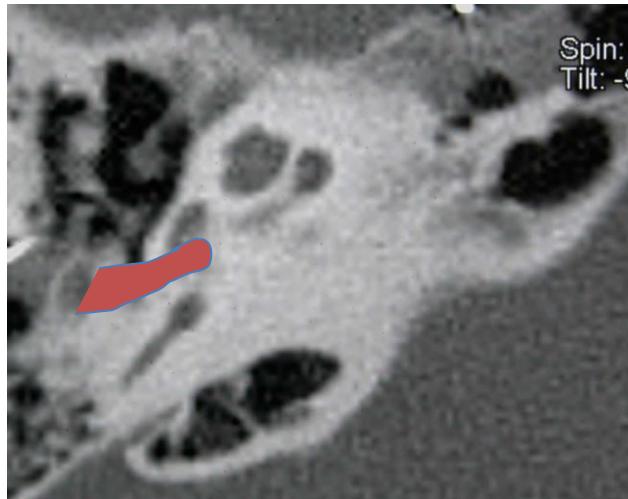


# Imagerie

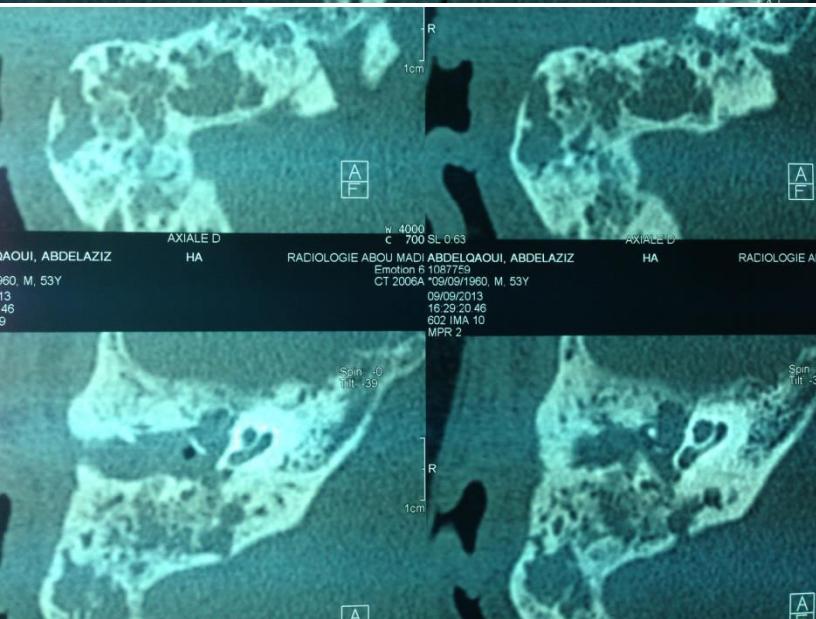
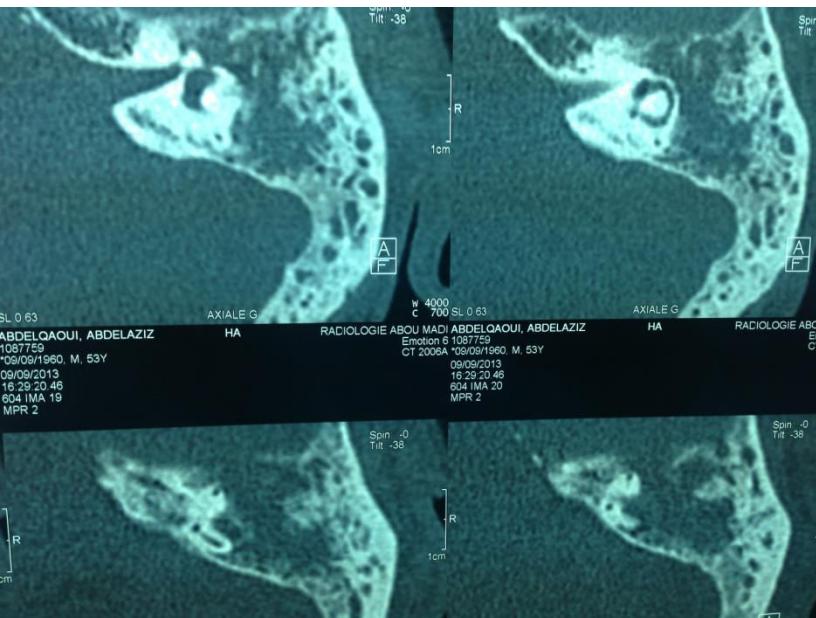
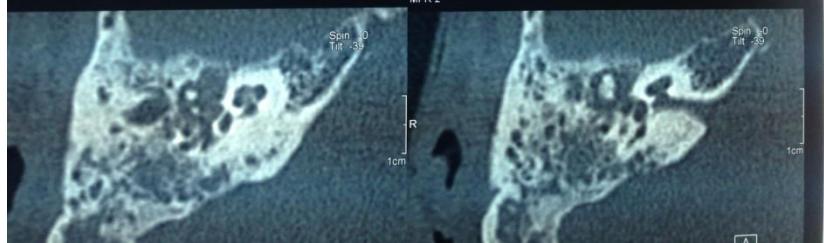
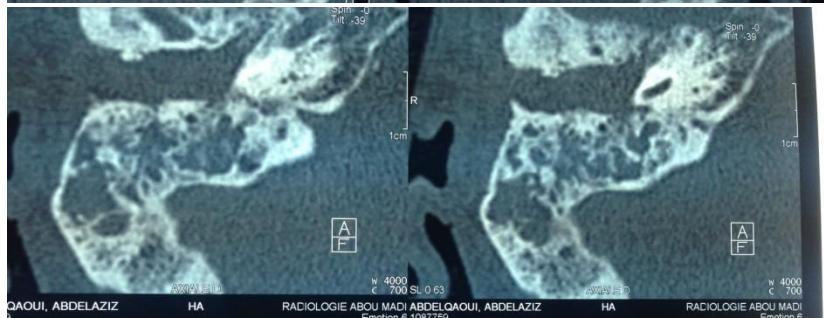
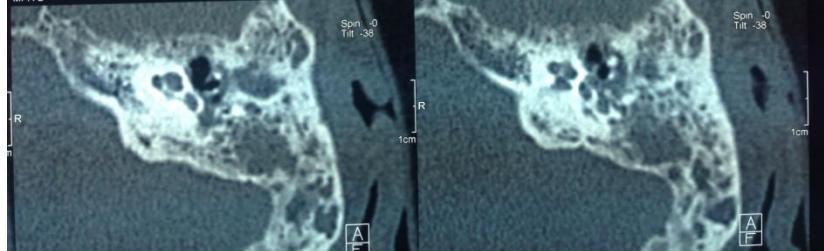
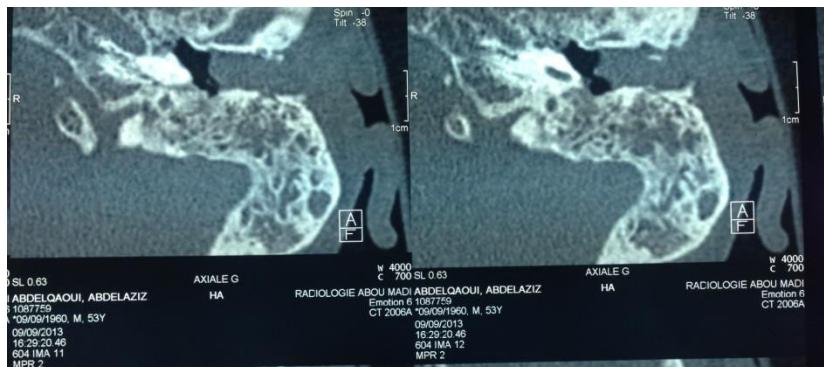
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  - The cochlea consists of 1.5 turns
  - Middle and apical turns coalesce to form a cystic apex
  - Dilated vestibule and enlarged vestibular aqueduct (EVA LVAS)



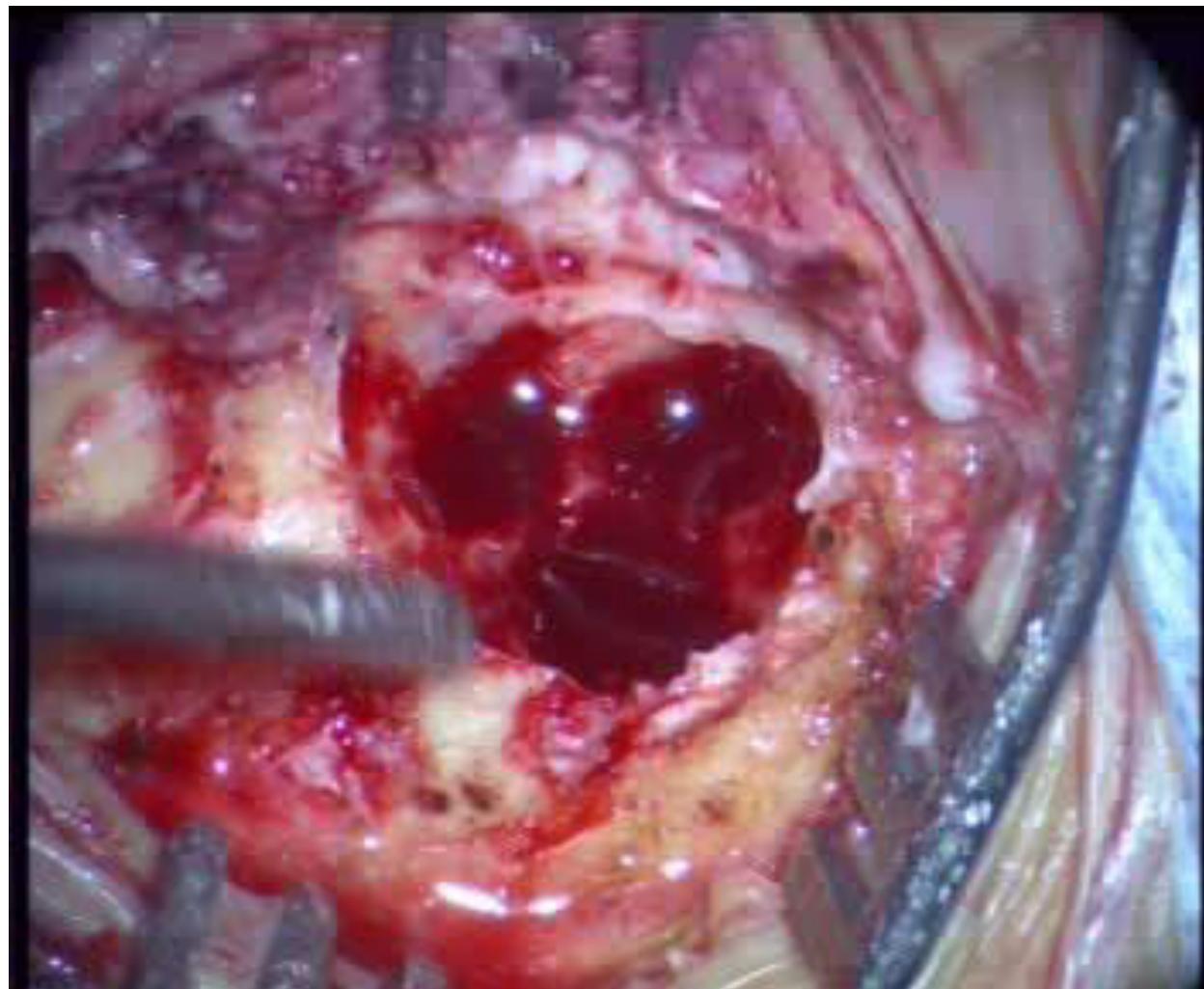
# Ossification/fibrosis



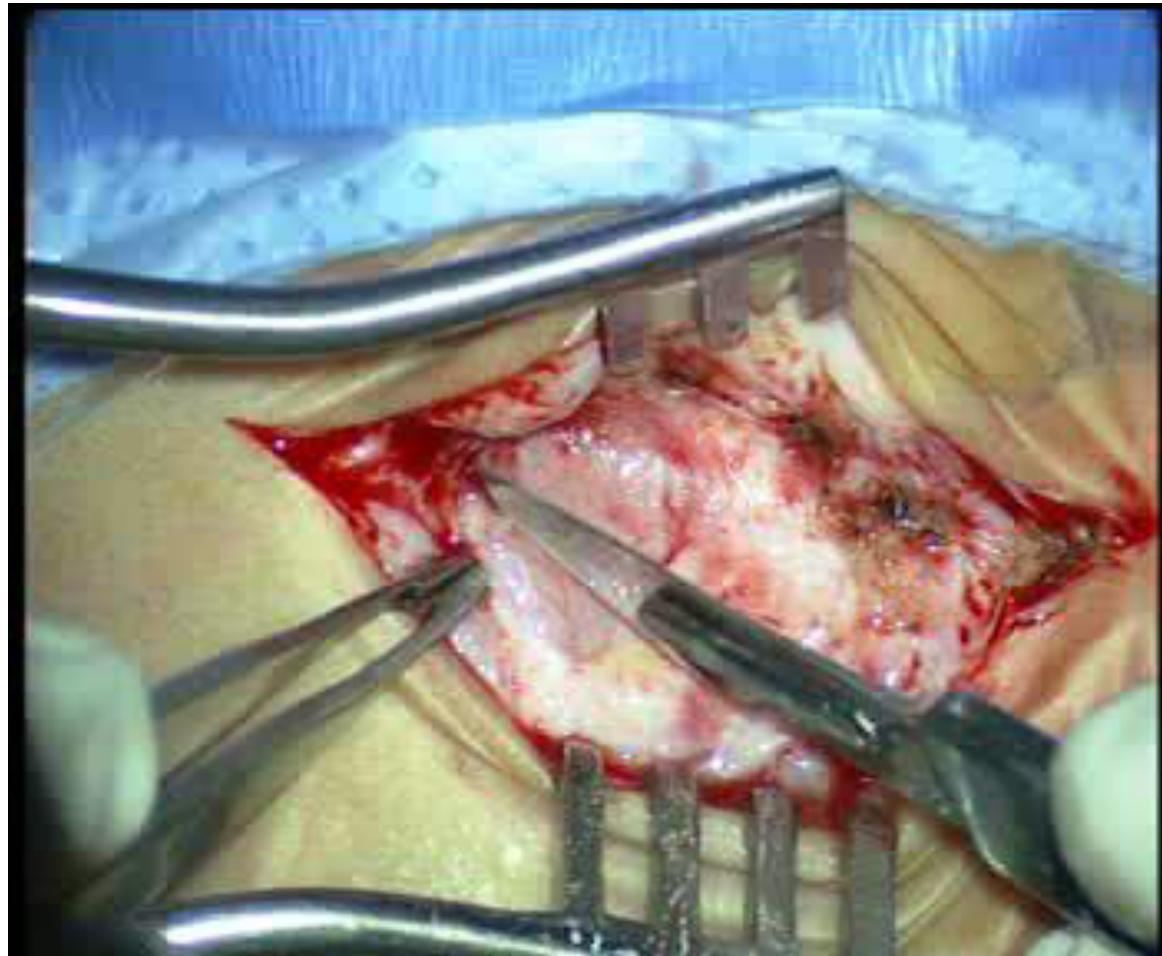
# IC post RTH



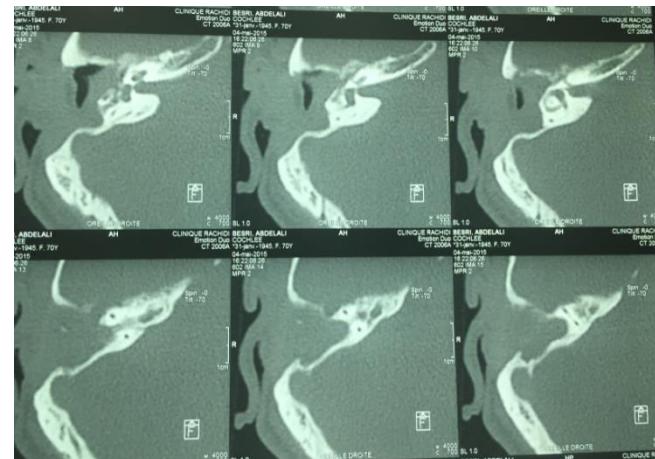
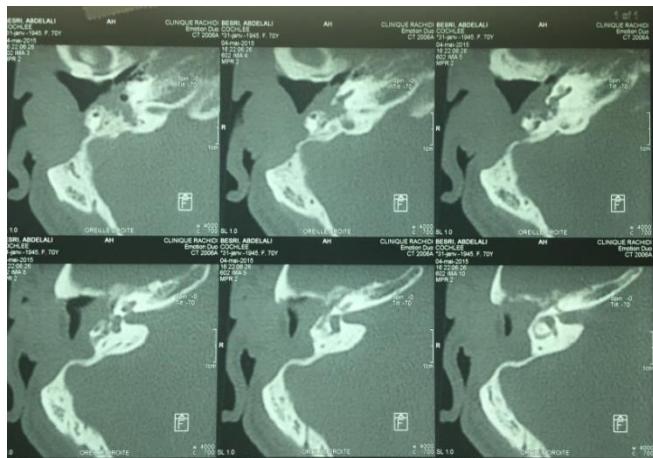
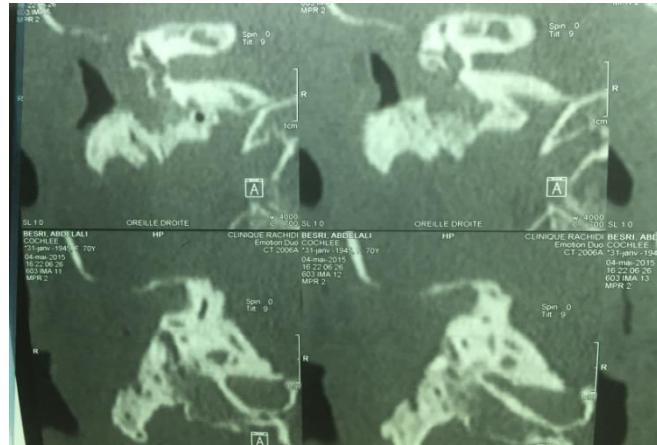
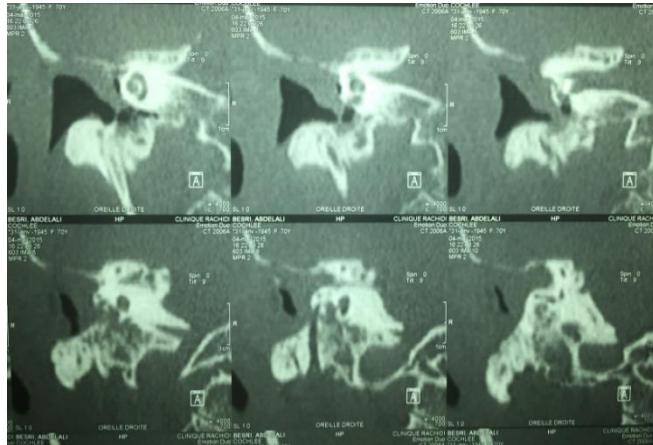
IC post RTH



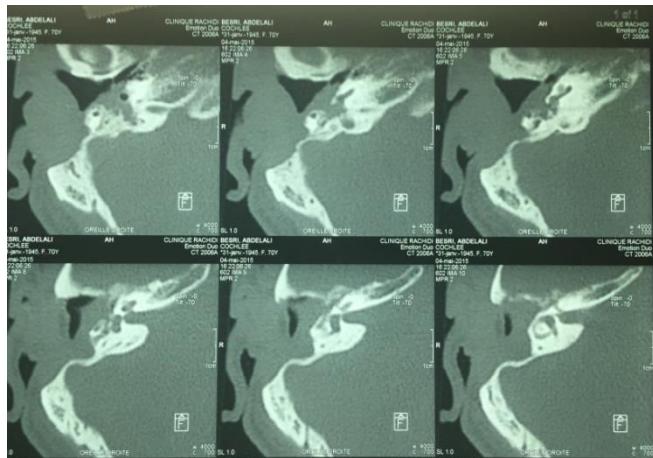
# Revision surgery



# CI and CHOLESTEATOMA



# CI and CHOLESTEATOMA



# COMPLICATIONS

## how to manage ?

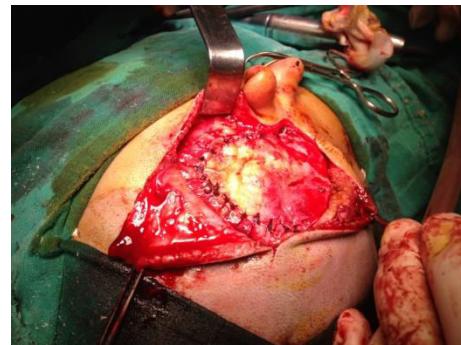
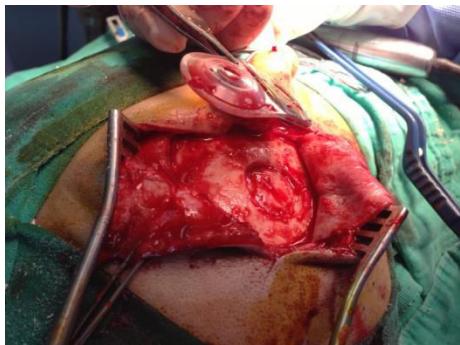
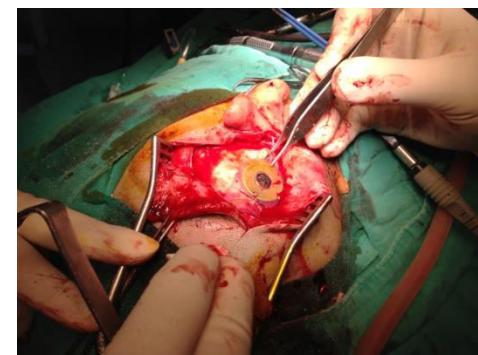
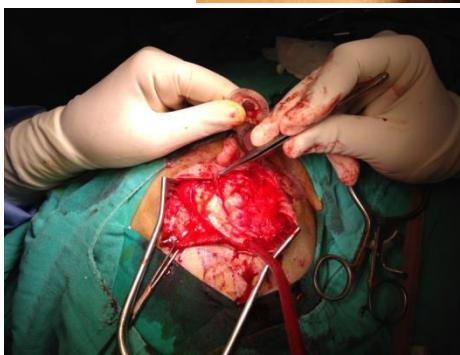
### Nécrosis, granuloma, surinfection :



# COMPLICATIONS

## how to manage ?

### Nécrosis, granuloma, surinfection :

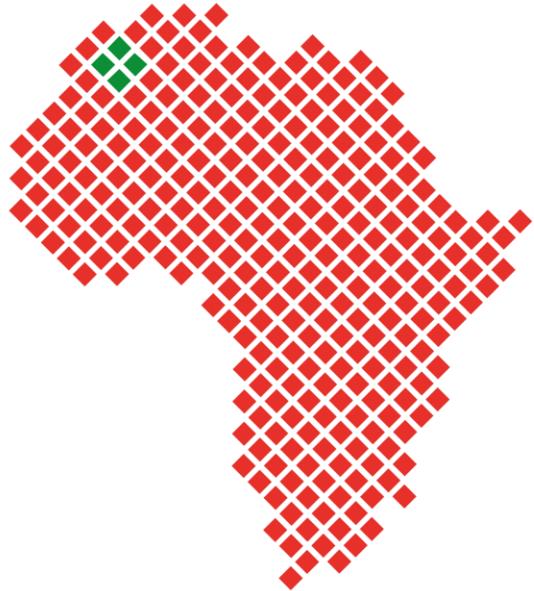


# Conclusions

- Perfect pre operative assessment
- Perfect knowledge of normal anatomy and variability
- Adaptation to all situations
- Immediate reactivity
- Post opérative care
- Follow up



2021  
candidate city



IFOS BOARD

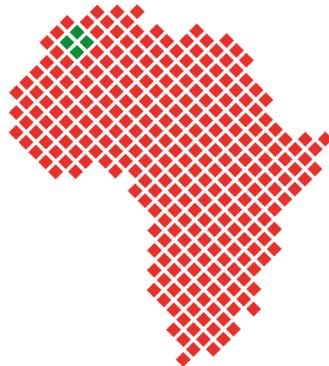
MARRAKECH 2021 – Candidate City

# Marrakech 2021 : a double ambition

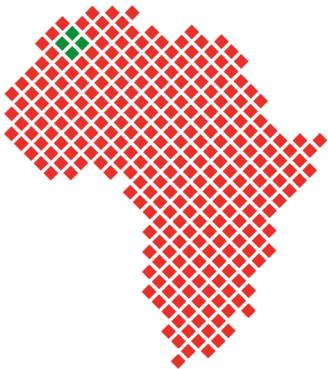
**IFOS**  
world congress

✿ MARRAKECH ✿

2021  
candidate city



- To share a worldwide scientific content
- To unit the entire ORL community and a continent and make them grow



2021  
candidate city

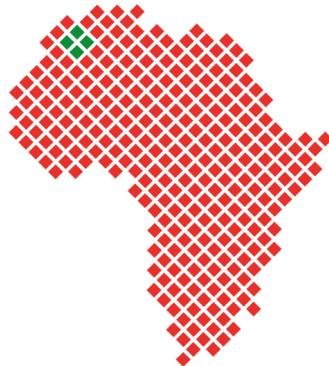
## 4) Marrakech, an attractive city



**IFOS**  
world congress

MARRAKECH

2021  
candidate city



# Marrakech



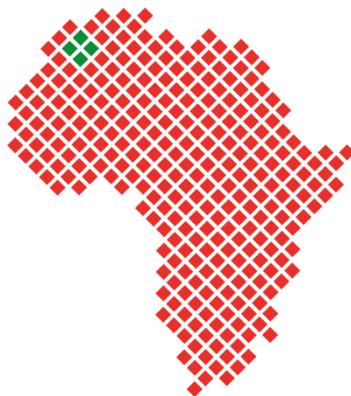
An **affordable** and **attractive destination** with a **guarantee of success** in scientific, organization, promotional and financial aspects.



**IFOS**  
world congress

↙ MARRAKECH ↘

2021  
candidate city



**Thank you for your  
attention**

Thank you  
for  
your attention



benghalem@benghalem.ma

# COCHLEOSTOMY

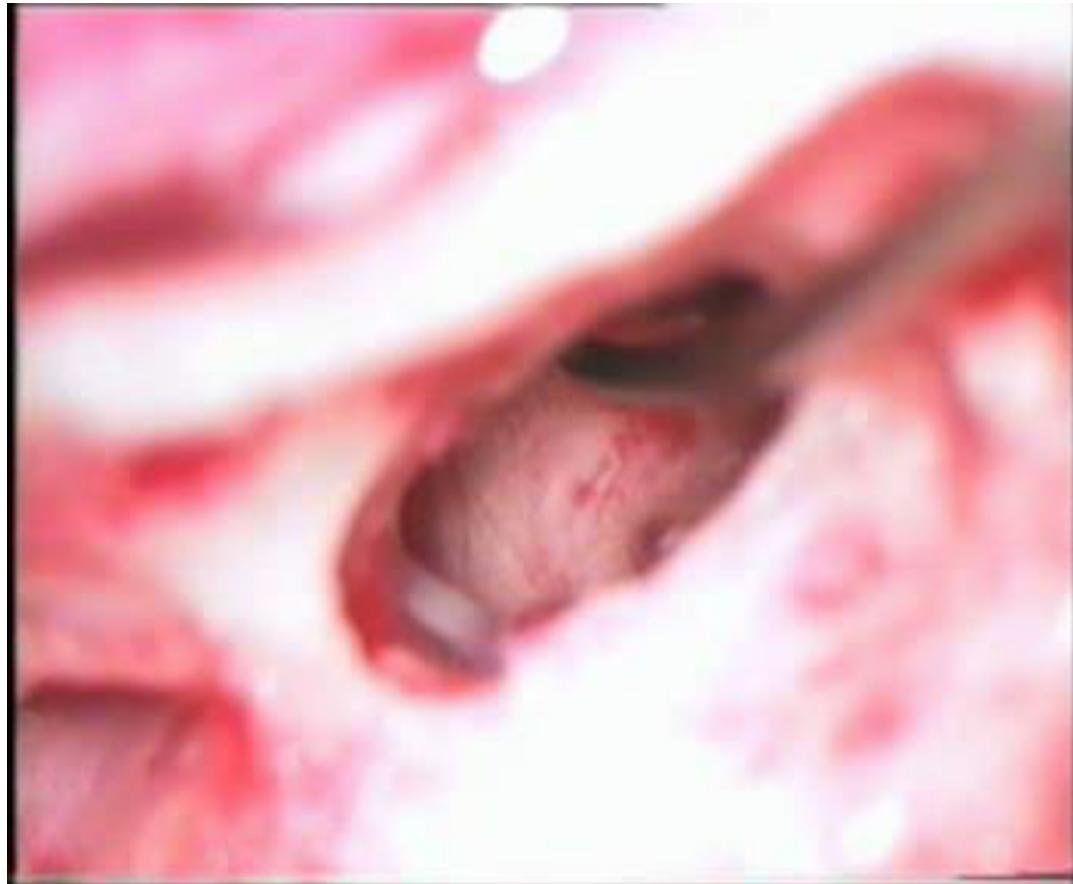
## COCHLEE

taille mature à la naissance

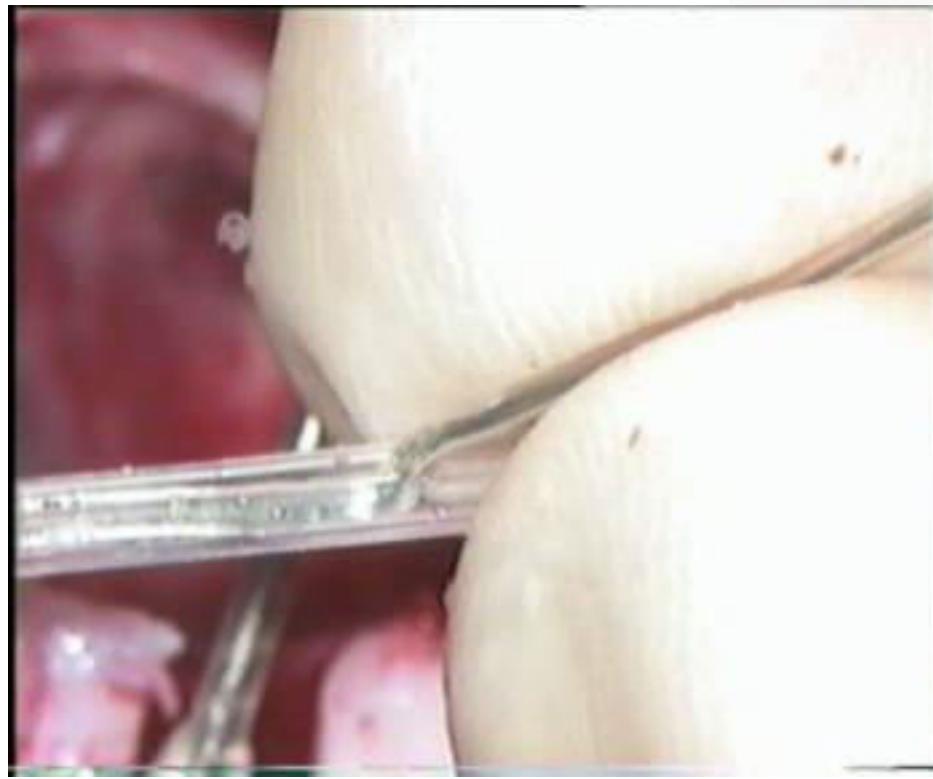
Orientation

Cellularité de l ' hypotympanum

Fenêtre ronde

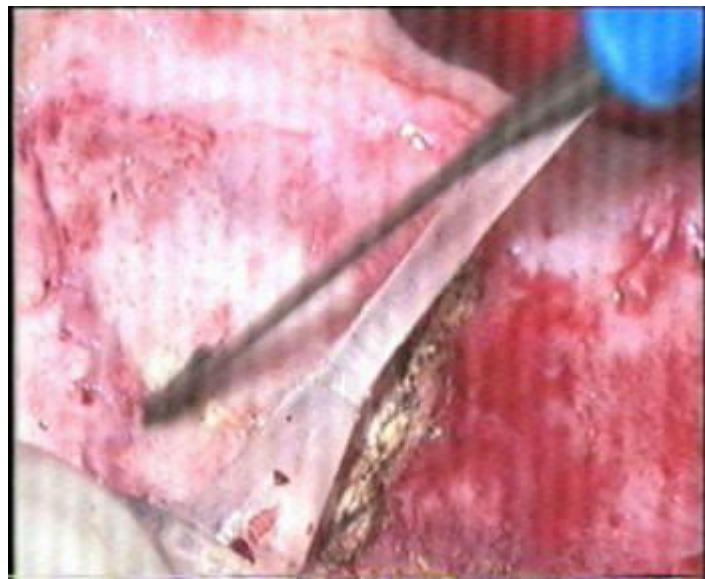


## •ELECTRODE INSERTION

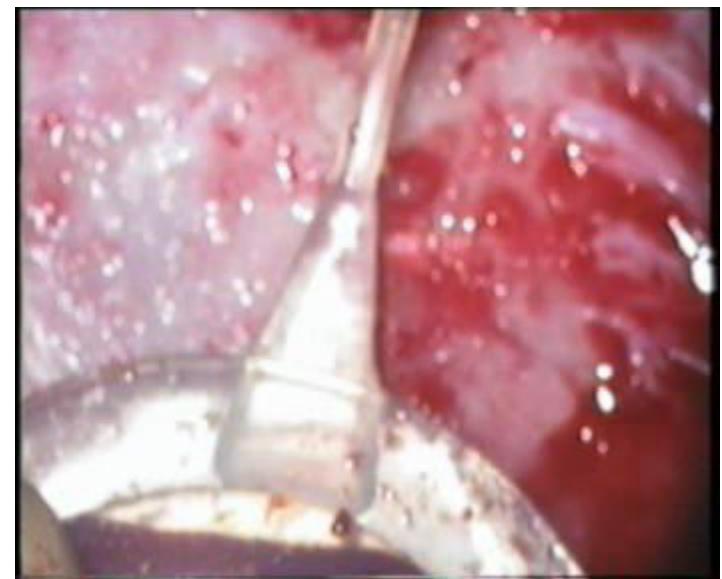


# AGE / ANATOMIE

- Corticale temporaire



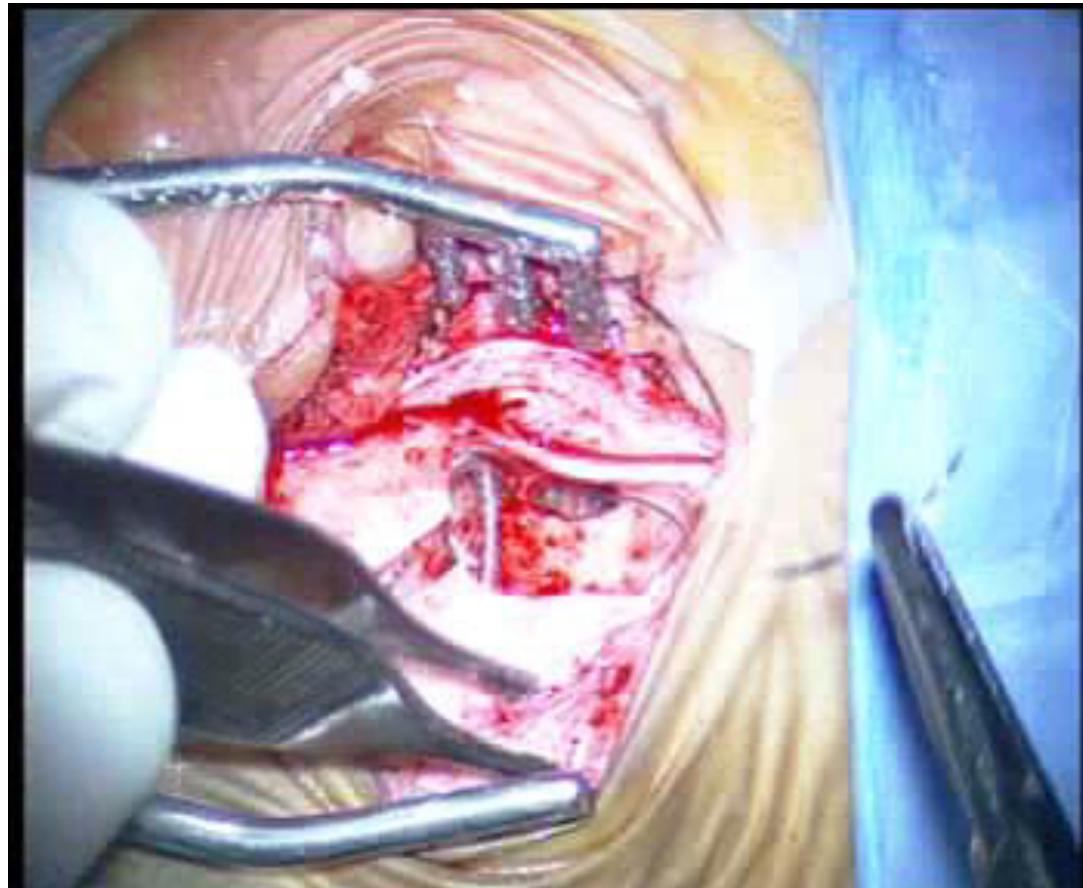
NOURRISSON



GRAND ENFANT

## AGE / ANATOMIE

- Corticale temporaire / **FIXATION**



# Conclusions

- Few difference between the CI surgery in the young infant and older child or adult
- The most important is minimal surgery concept
- Safety anesthesiologie
- The choice of the cochleostomy or round window
- Secured or fixation to the bone
- Musculo-periostum flap

THANKS .... !  
To MANY and ALICIA



18 18:08

THANKS .... !



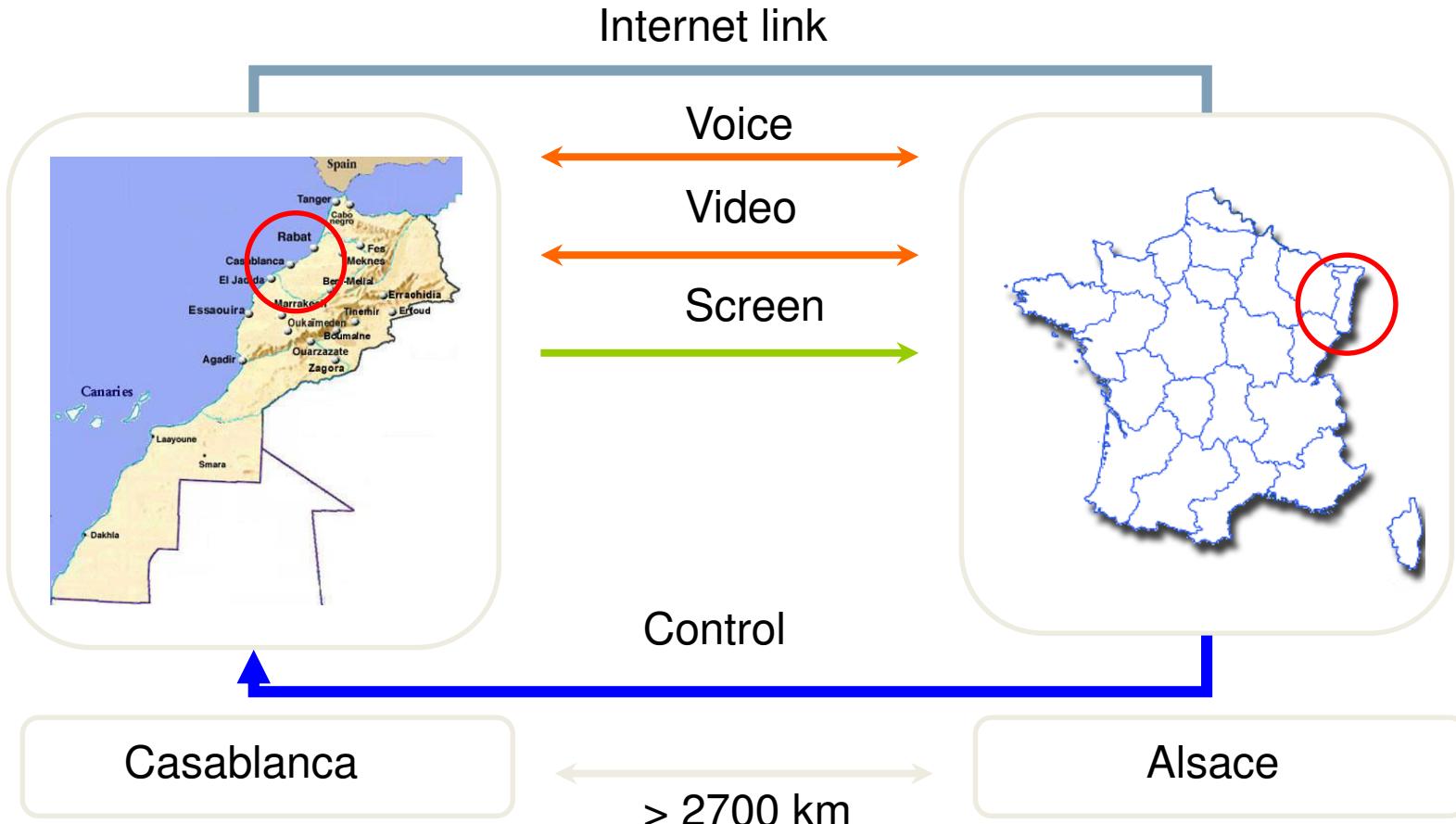
THANKS .... !



# ADVANCED BIONICS FAMILY



# First configuration



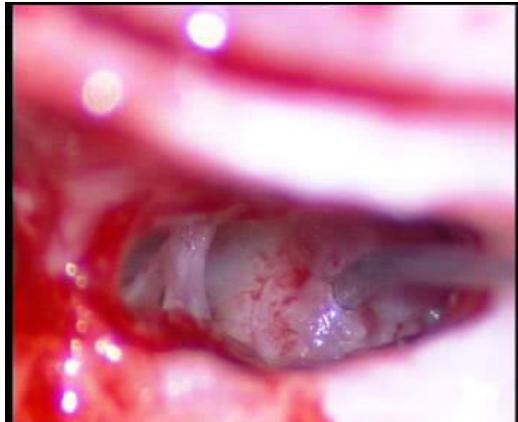
# Peroperative sessions

- Measurements performed :
  - Impedance
  - NRI
  - eSRT
- All measurements were successfully performed
- Good quality of video for an easy communication between expert and surgeon and the local audiologist

# Peroperative sessions

– eSRT

---



**CI Remote Programming**  
*Per-Op Stapedius Reflex Measurements*



– NRI      Peroperative sessions

---

**CI Remote Programming**  
*Per-Op NRI Measurements*



Thanks for your attention  
hope to see you in Morocco



# Selection

- 1 adult, 1 teenager, 2 children
- post lingual deafness
- Implantation
  - HiRes 90K
  - Auria (HiRes) ou PSP (HiRes 120)
- Minimum 6 month of expérience with their CI system
- Fitted with SoundWave
- Able to comment

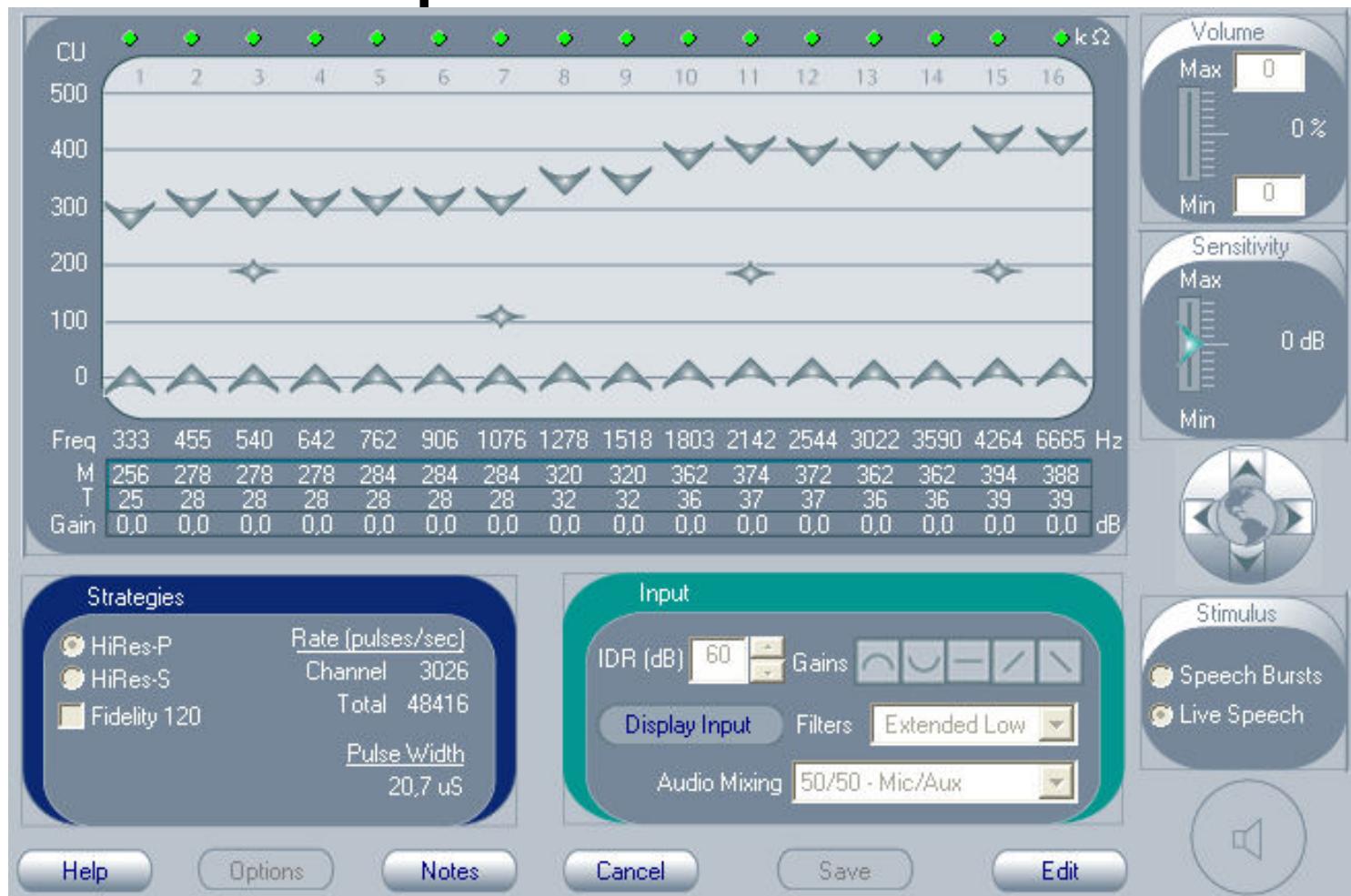
# Goal

- Control / follow up session
  - Impedance measurements
- Checking session
  - Programming session
    - M values measurements
    - Live control
  - Sound processor programmed

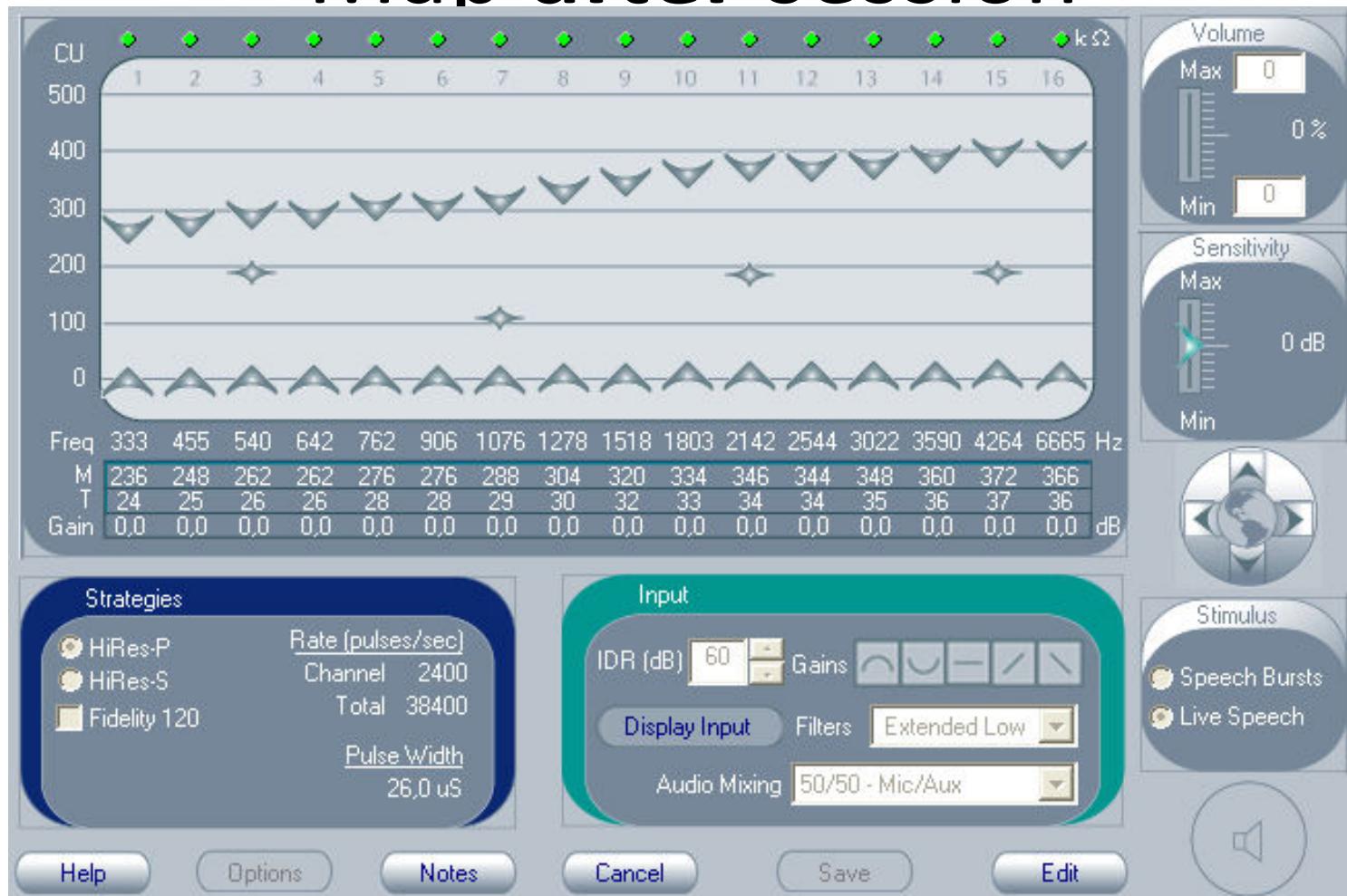
# Expert Screen



# Map before session

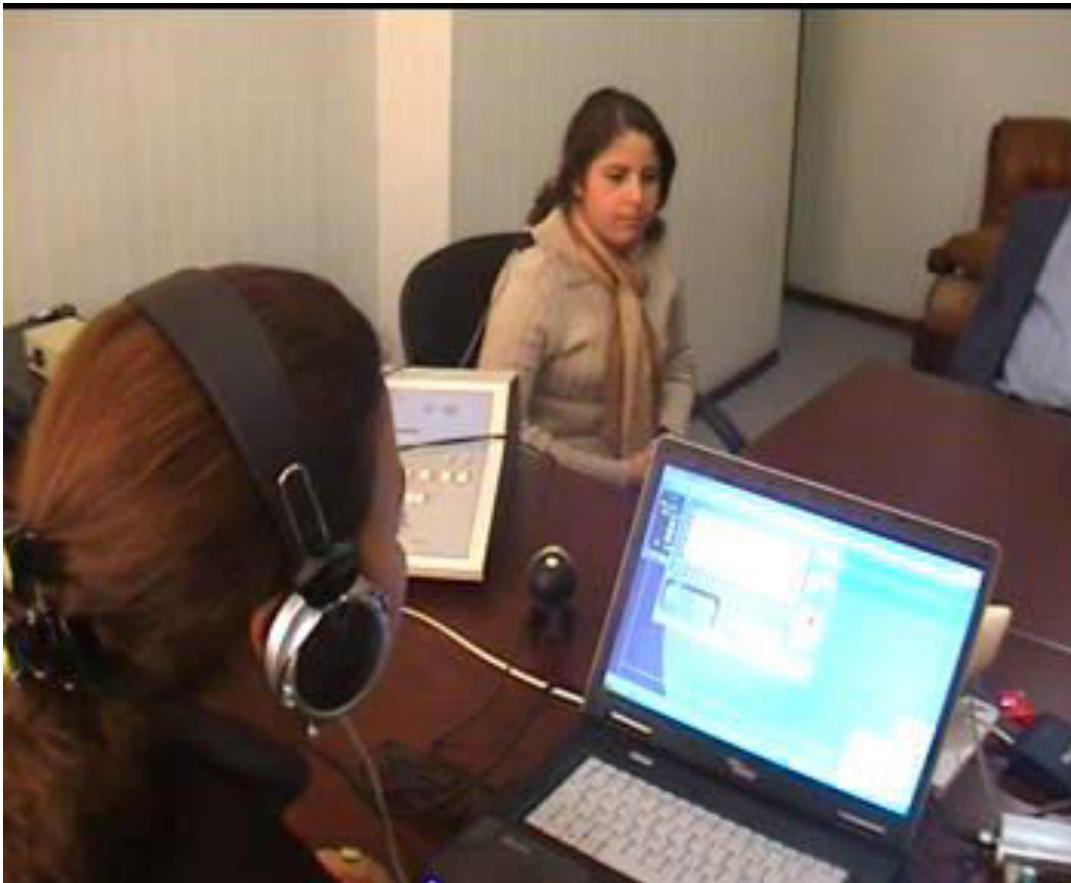


# Map after session



Mean variations of +/- 3% along the electrode array in comparison with presession Map.

- Different stages
- Programming session
- Control



# Post operative sessions - Results

## Connection

- Expert controls : no limitation
- Communication and control speed : acceptable
  - minimal latency between expert command and local effect
  - need to adapt to latency
- Good communication audio and vidéo
- Emergency stop : available and checked
- Complete programming session 15 mn
  - Impedance measurements
  - M values control
  - Live voice control
  - Programs loading
- Transparency
  - No time difference between remote control and local control
  - Low differences for CI system programs obtained

- Minimal invasive



- Minimal invasive



- Technique chirurgicale

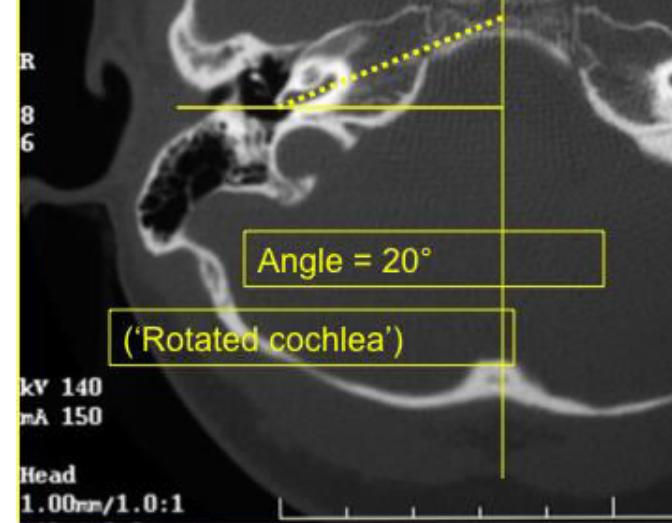
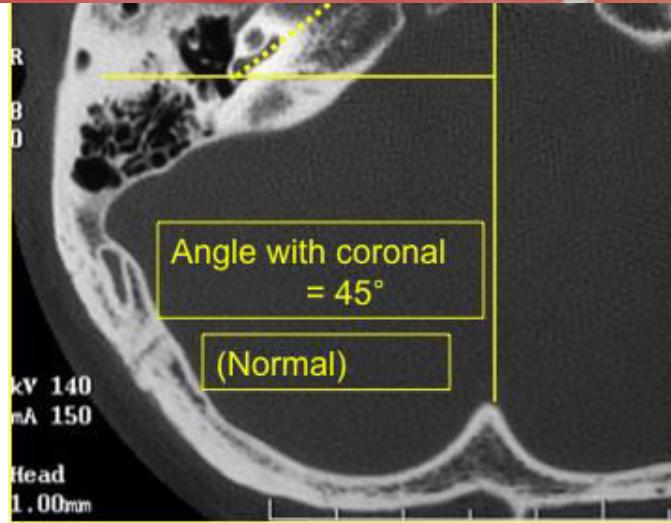
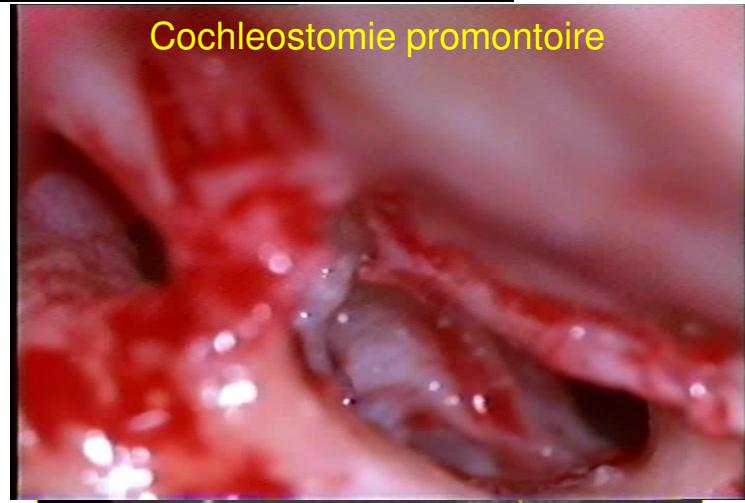
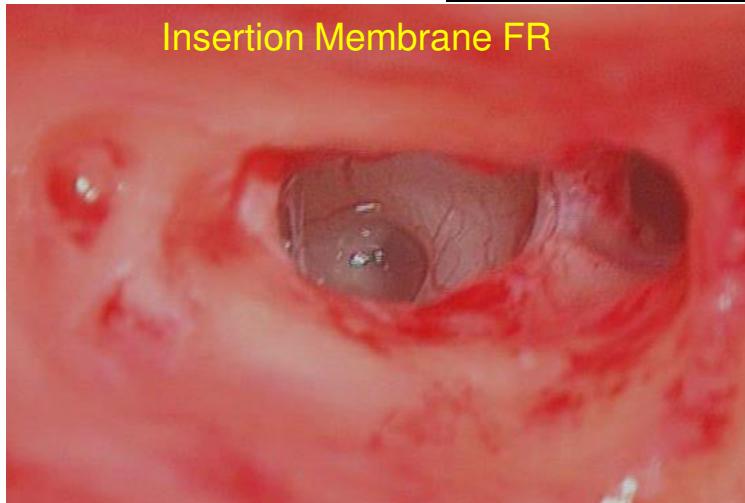




- Concept : Minimal invasive



# POSITION DE LA FR



# COCHLEOSTOMIE

## COCHLEE

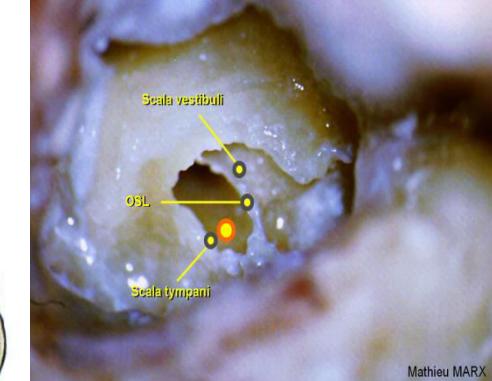
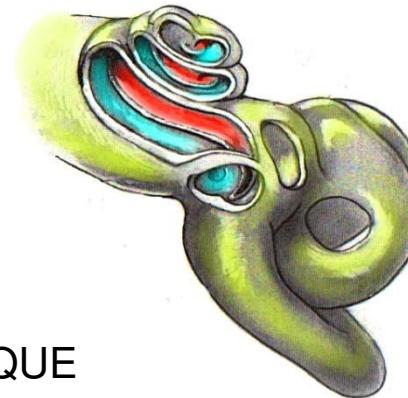
taille mature à la naissance

Orientation

Cellularité de l ' hypotympanum

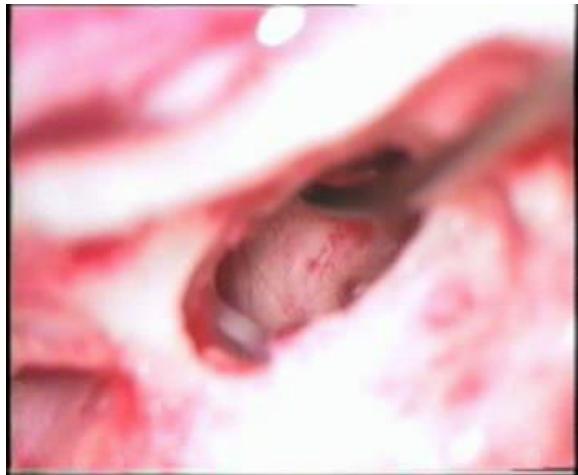
Accessibilité de la Fenêtre ronde

INTRODUCTION DANS LA RAMPE TYMPANIQUE



Mathieu MARX

Cochleostomie



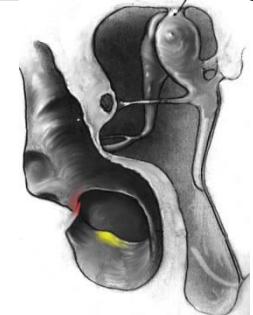
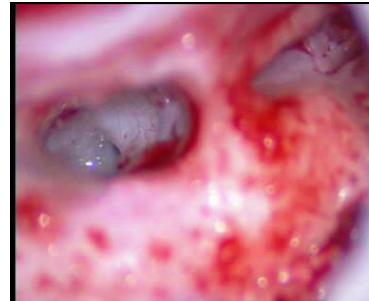
membrane Fenetre ronde



Crista fenetsra



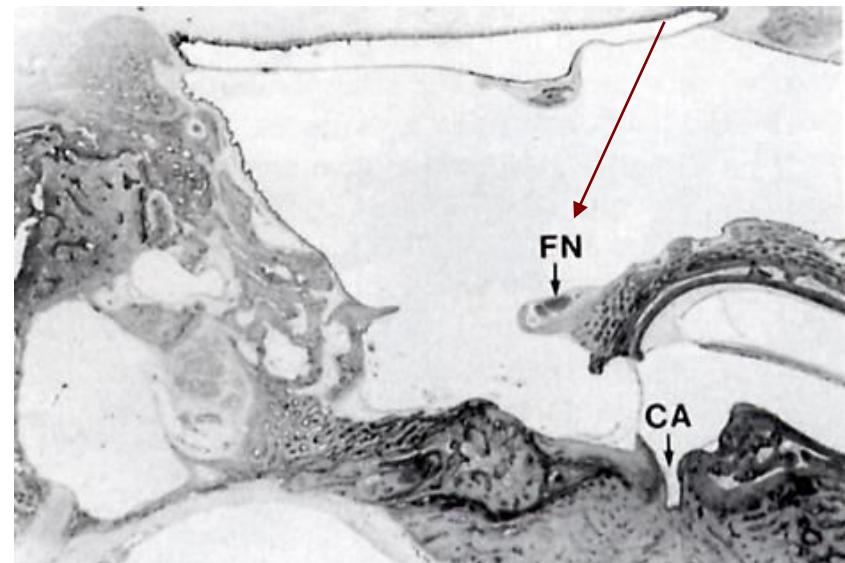
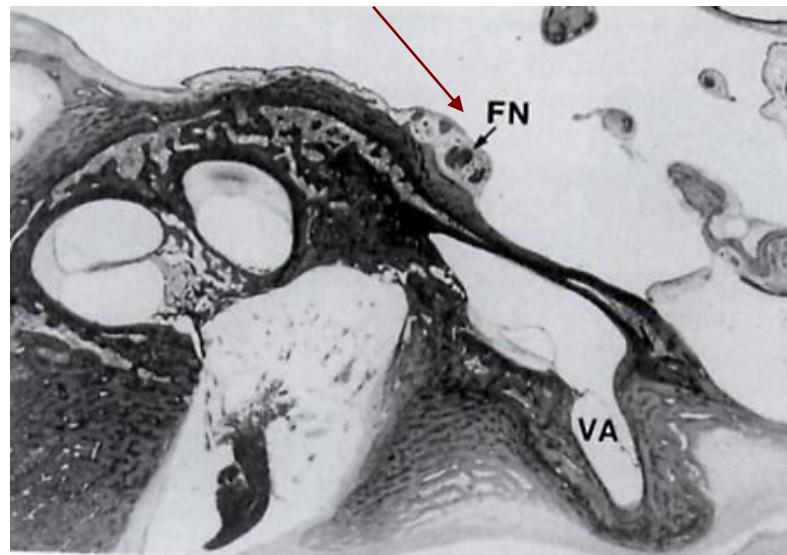
Cote gauche



# facial aberrant

## Facteurs étiologiques

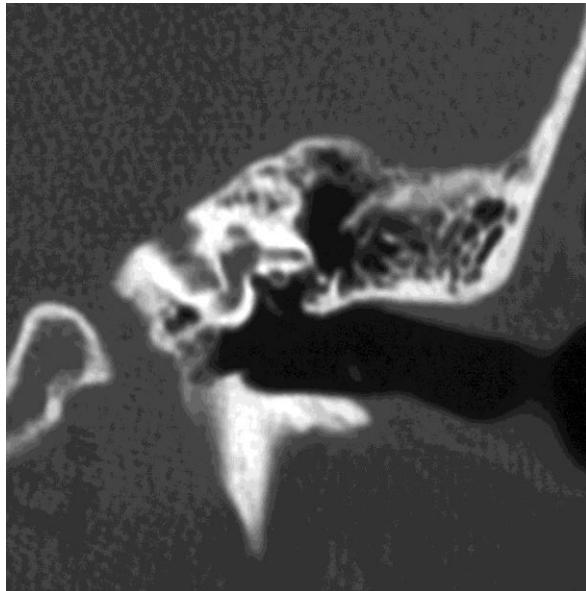
- trajet aberrant dans les malformations congenitales
- difficultés d'identification



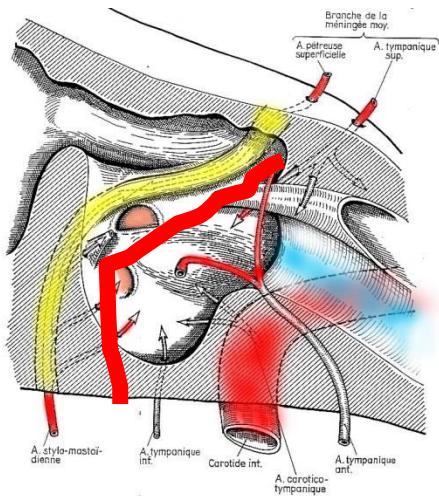
# facial aberrant

## Comment gérer

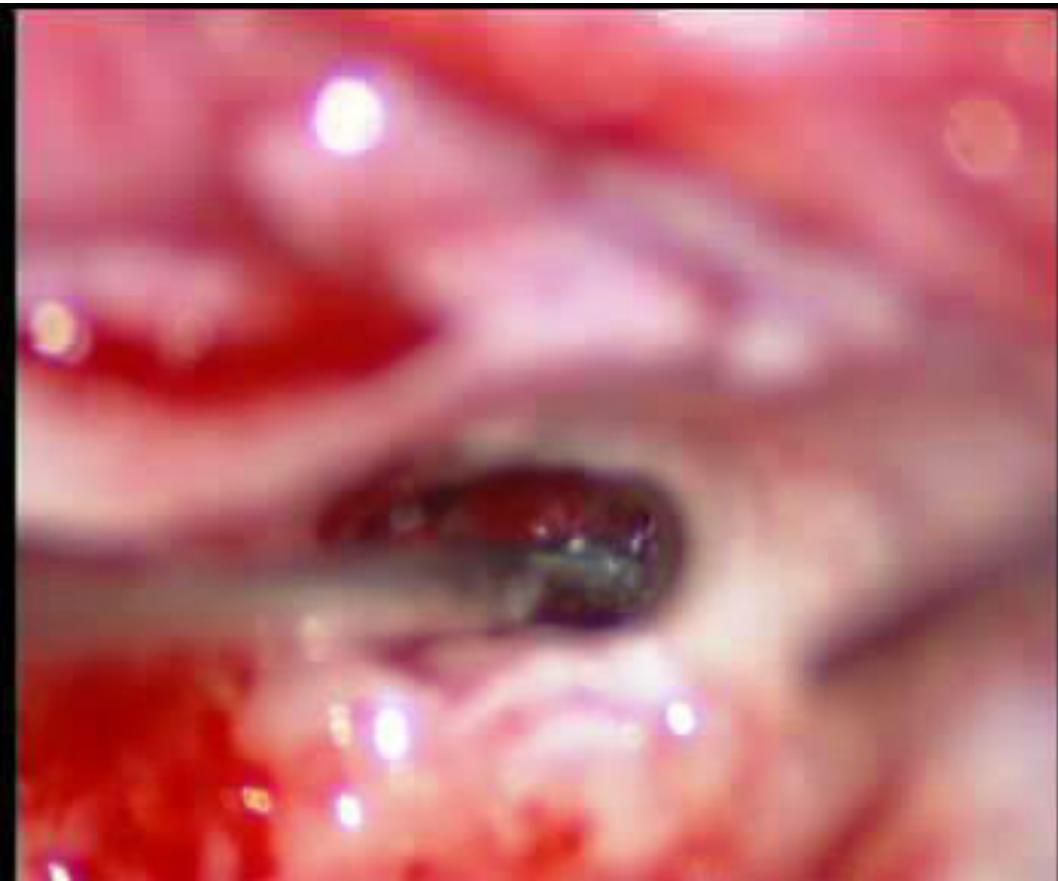
- monitorage dans les cas difficiles NIM  
( M Congénitales)



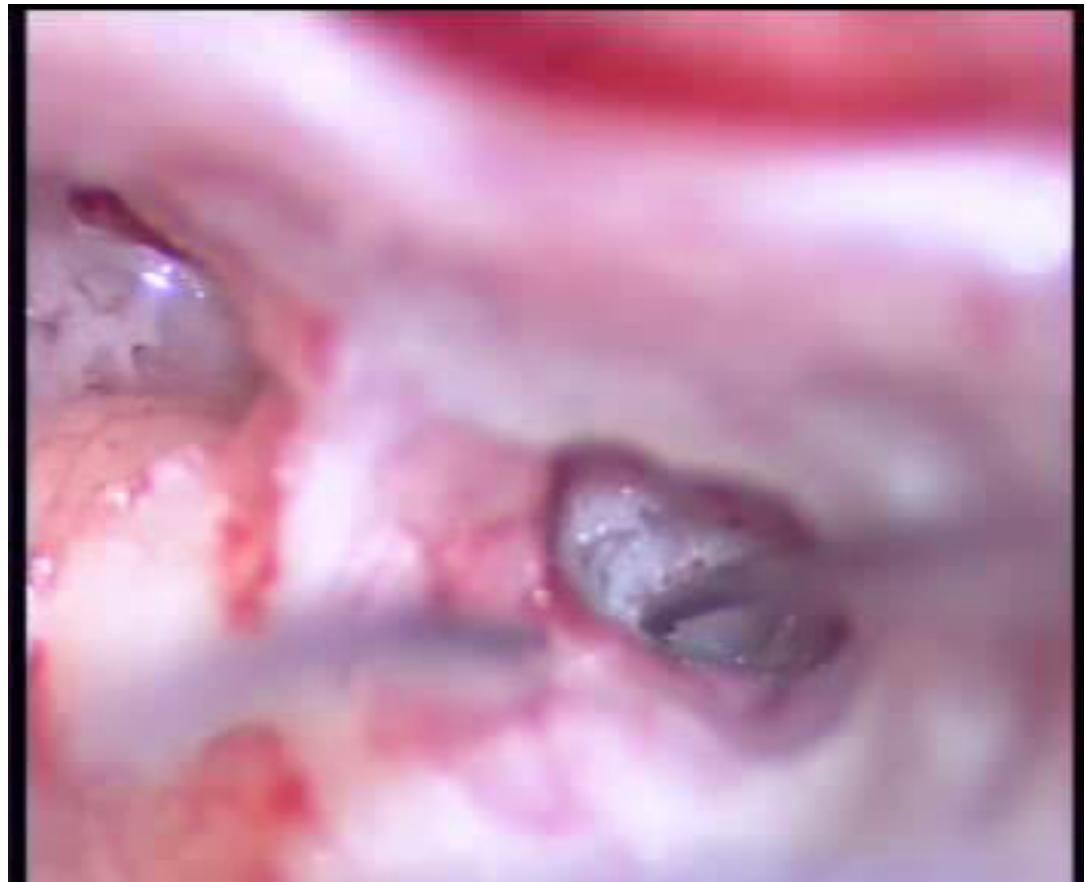
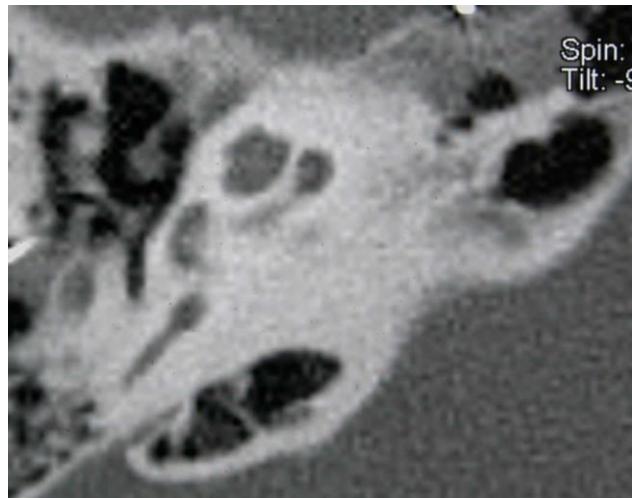
# facial aberrant, FR profonde et fermée



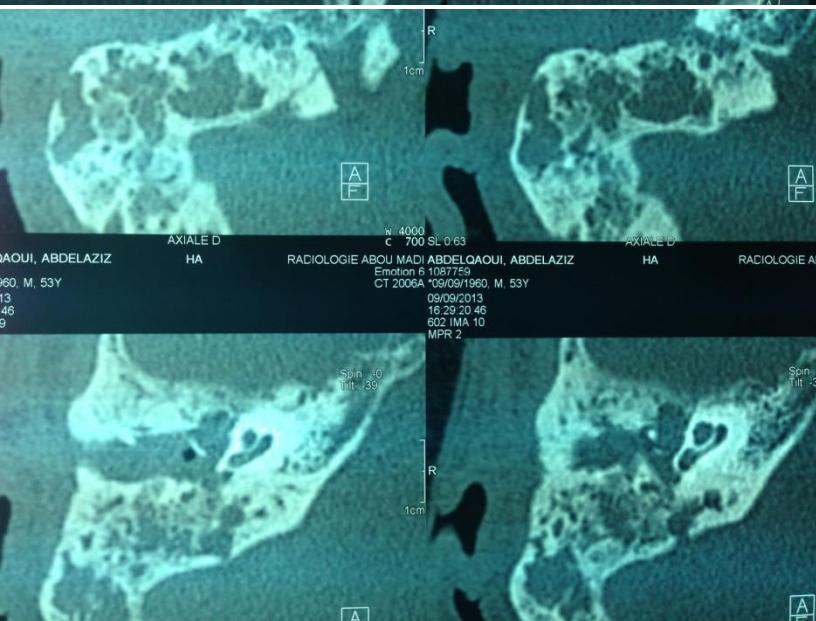
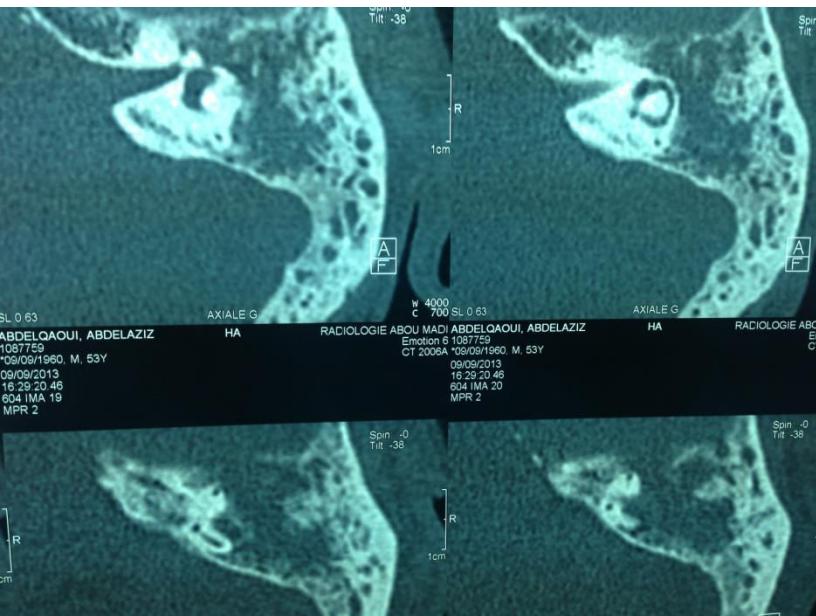
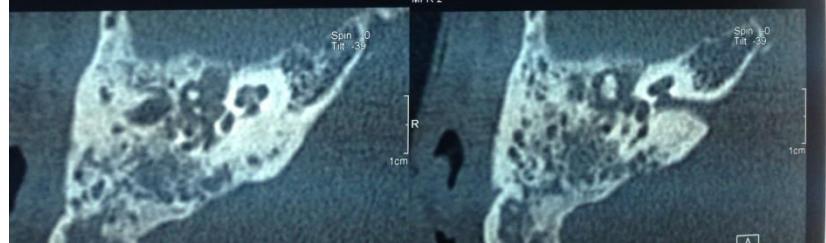
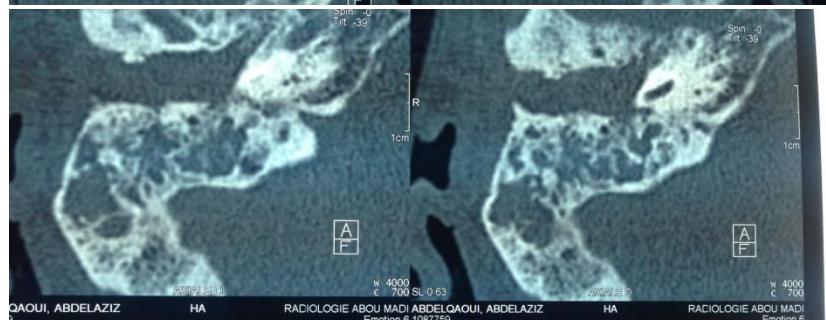
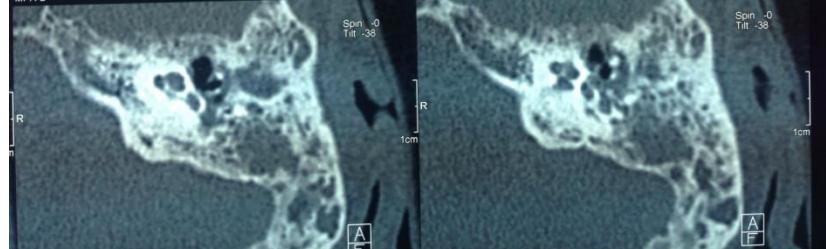
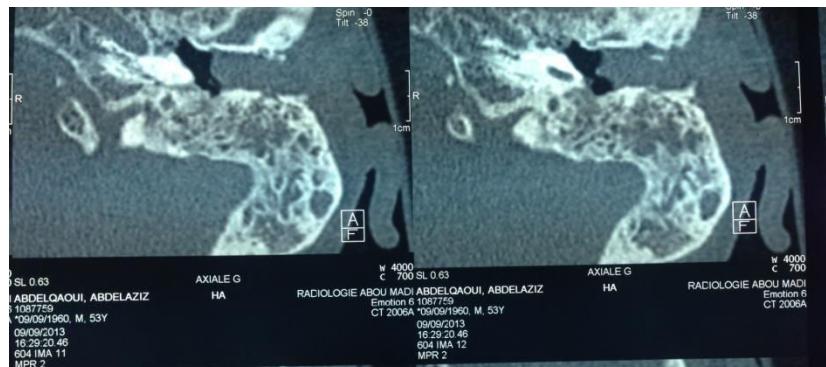
# GEYSER



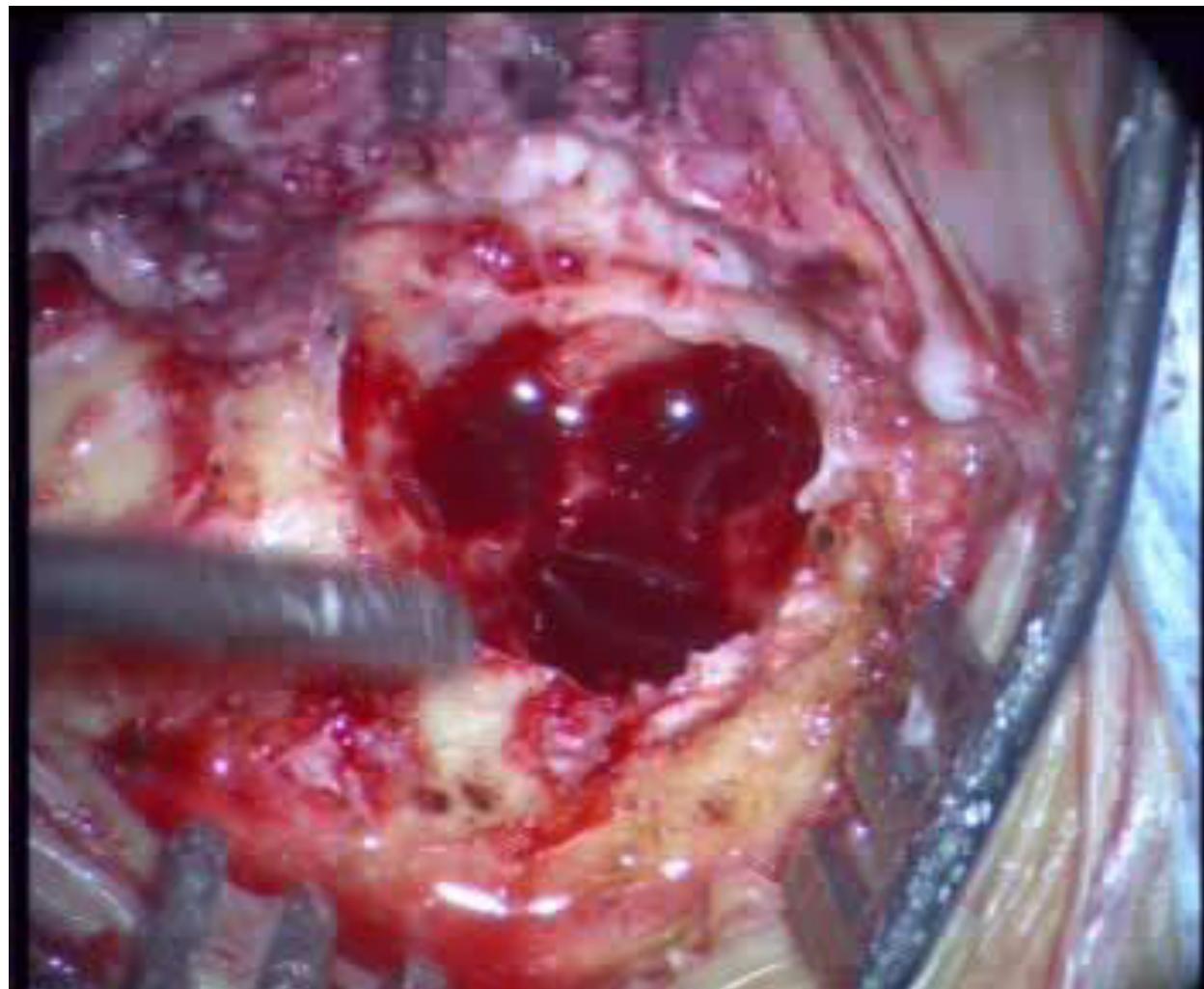
# Cochlée ossifiée



# IC post RTH

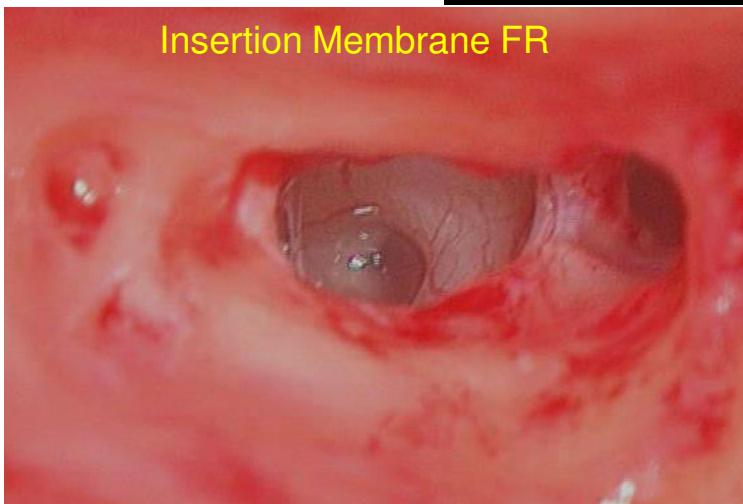


IC post RTH

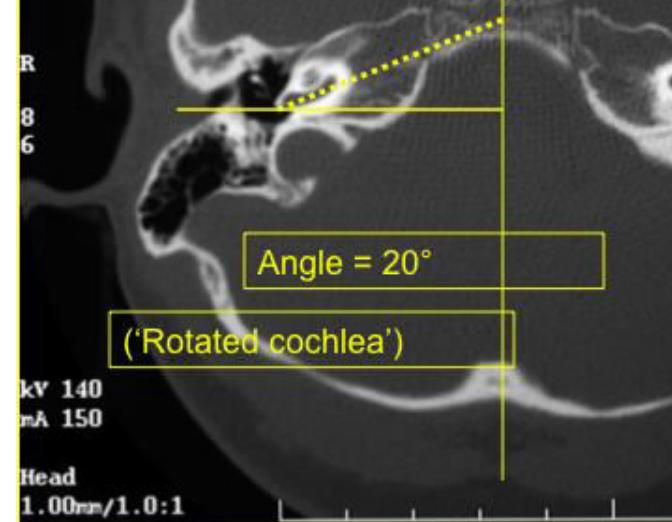
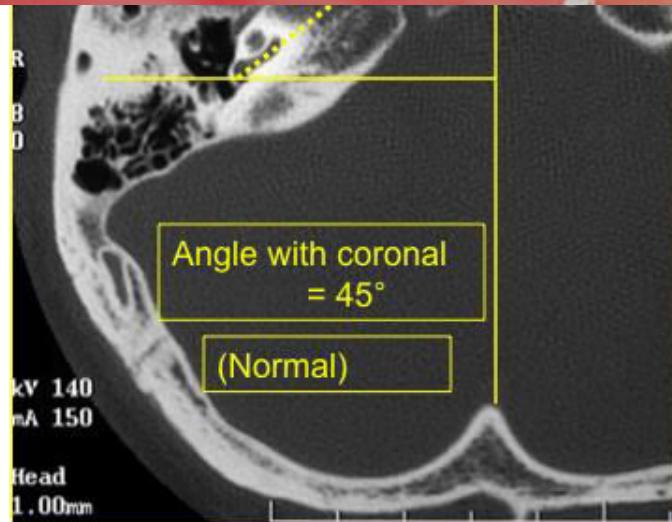


# RW POSITION

Insertion Membrane FR



Cochleostomie promontoire



Angel RAMOS (LAS PALMAS )