

慢性中耳炎/膽脂瘤



台中慈濟醫院耳鼻喉科

許權振



內容大綱

1. 中耳炎/膽脂瘤
2. 中耳乳突腔壓力調節
3. 鼓室成形手術
4. 手術病例
5. 耳咽管氣球擴張術



慢性中耳炎/膽脂瘤

急性中耳炎(AOM)

- 中耳發炎的急性發作病徵 (耳膜膨出或飽滿, 耳膜發紅, 耳膜急性穿孔流膿) 和症狀 (耳痛, 不安, 發燒)
- 中耳積液

積液性中耳炎(OME)

- 中耳積液, 但沒有急性發炎的徵候和症狀

慢性中耳炎(COM)



慢性中耳炎/膽脂瘤

1. 管鼓病變(Tubotympanic Disease)

永久性耳膜穿孔(permanent perforation)

慢性管鼓黏膜炎(chronic tubotympanic mucositis)

2. 上鼓室乳突竇病變(Attico-Antral Disease)

膽脂瘤(cholesteatoma)



主訴：34歲男性，右耳間斷性耳漏和聽損；
其他症狀(-)



short process
(malleus)

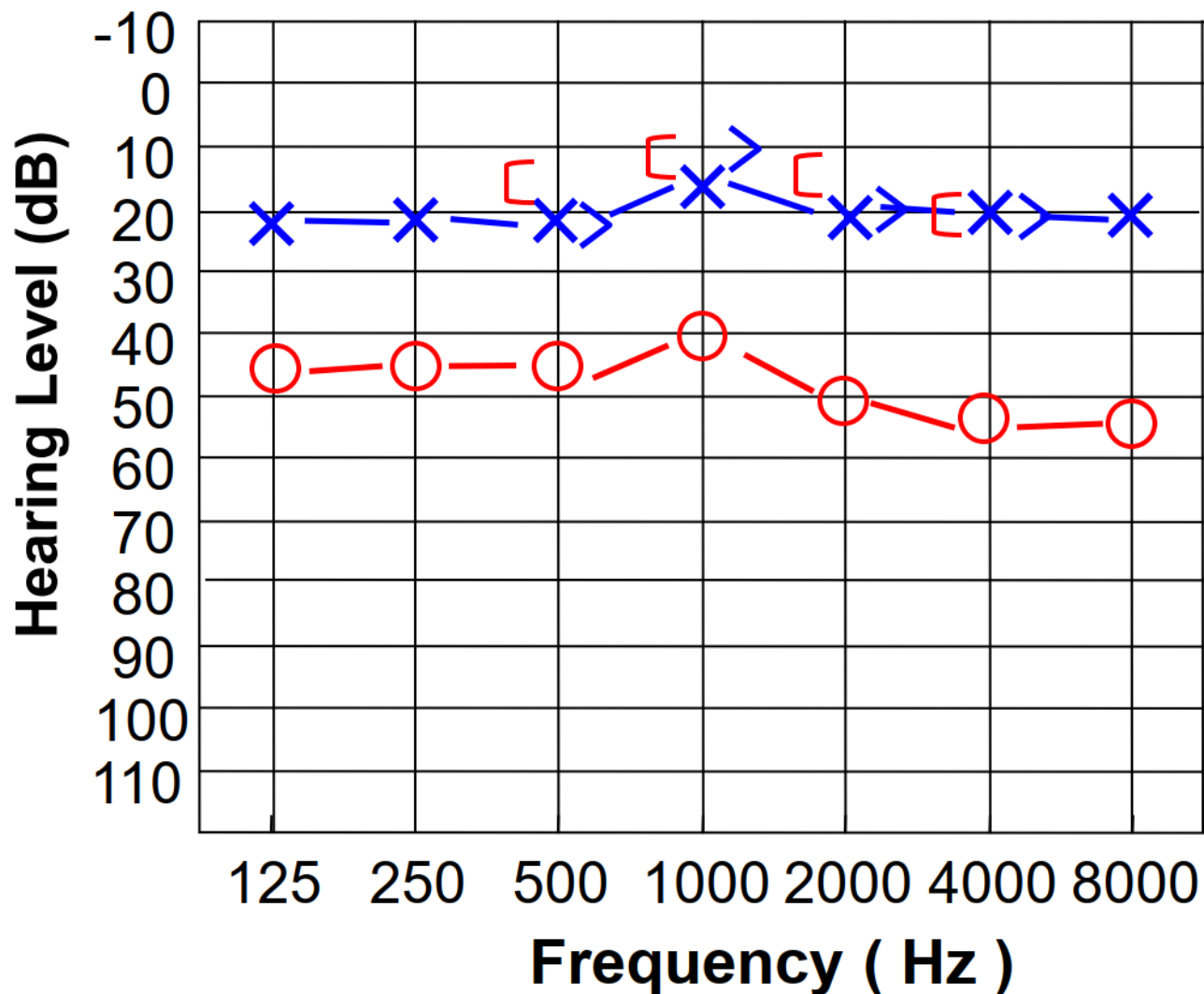
tympanosclerosis

central perforation

middle ear mucosa



慢性中耳炎 Chronic Otitis Media (Tympanic Mucositis)



慢性中耳炎/膽脂瘤

膽脂瘤(cholesteatoma)

1. 部位

外耳(external ear)、中耳(middle ear)
乳突(mastoid)、岩部(petrosa)

2. 時間

先天性(Congenital)

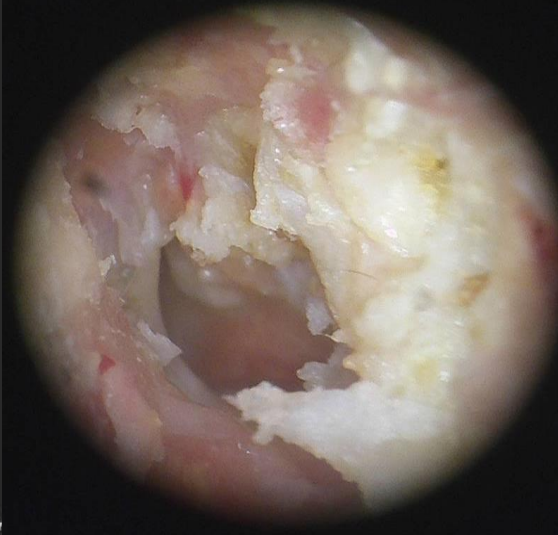
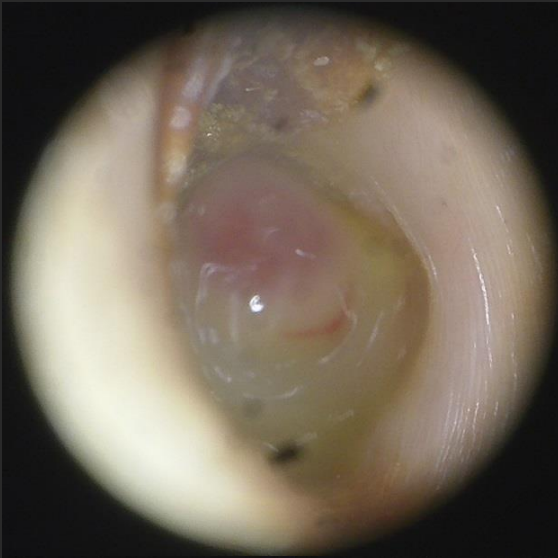
後天性(Acquired): 原發性(primary)

續發性(secondary)

復發性(recurrent)



慢性中耳炎/膽脂瘤



attic retraction

cholesteatoma

pars tensa

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膽脂瘤(後天性或先天性) Cholesteatoma

cholesteatoma

cholesteatoma



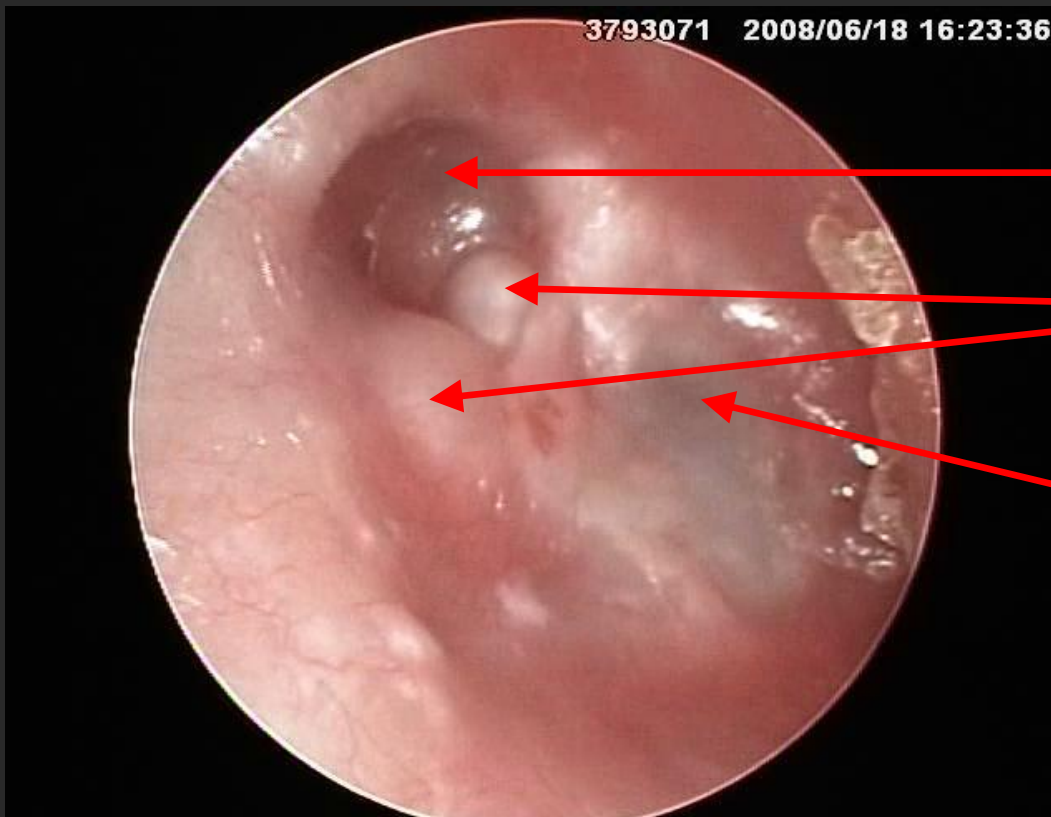
2° acquired

1° acquired

congenital



膽脂瘤(後天性或先天性) Cholesteatoma



attic retraction

cholesteatoma

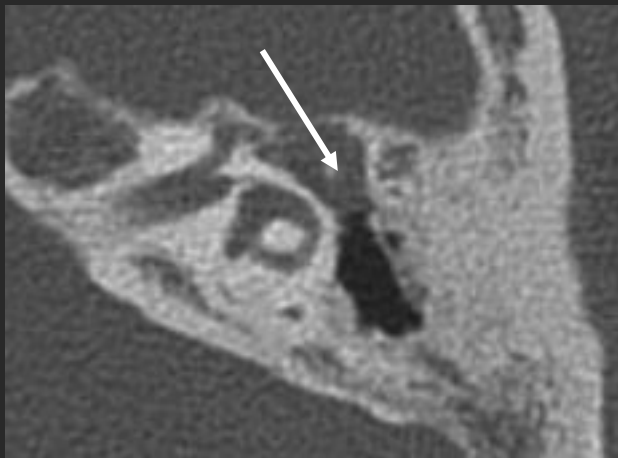
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recurrent

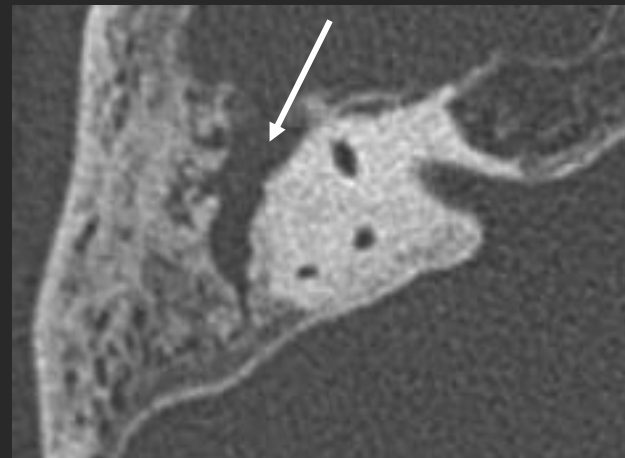
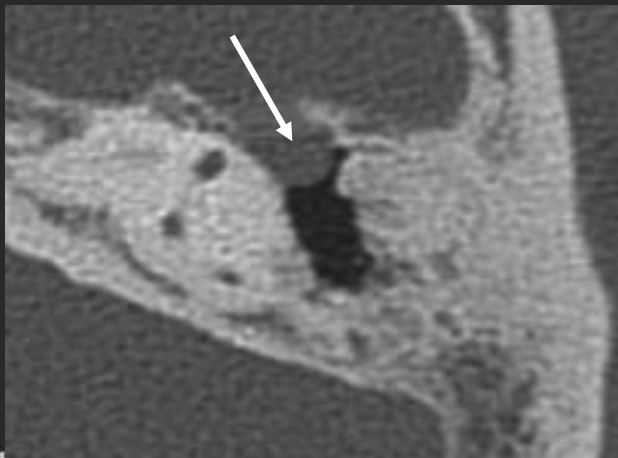
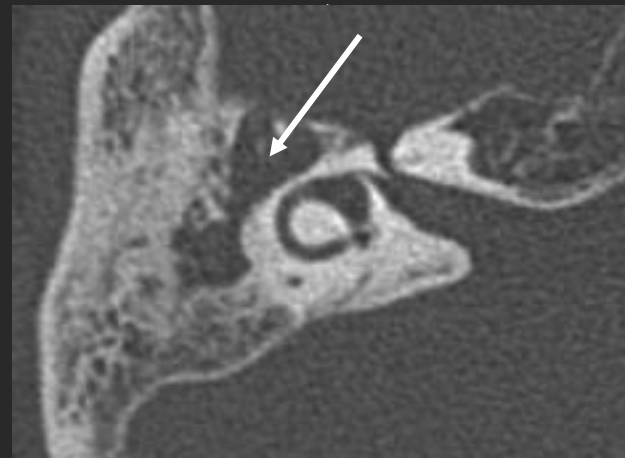


慢性中耳炎併膽脂瘤 Chronic Otitis Media with Cholesteatoma

#3182805



#5726378



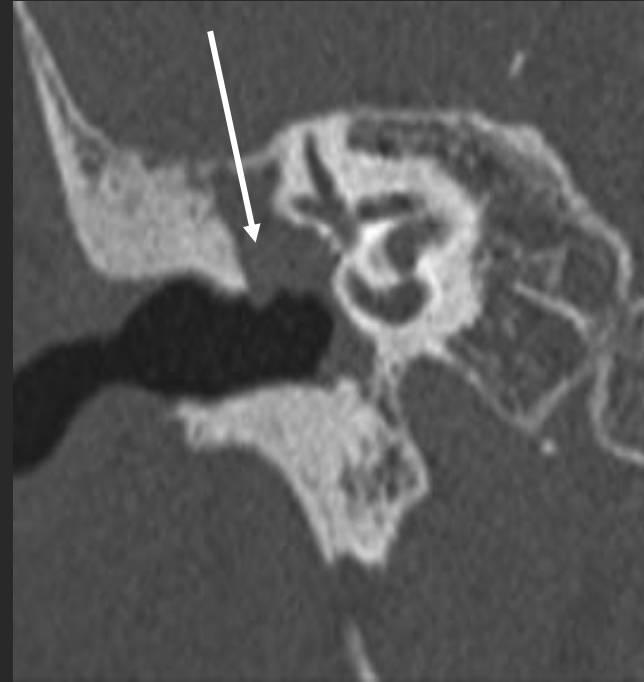
慢性中耳炎併膽脂瘤

Chronic Otitis Media with Cholesteatoma

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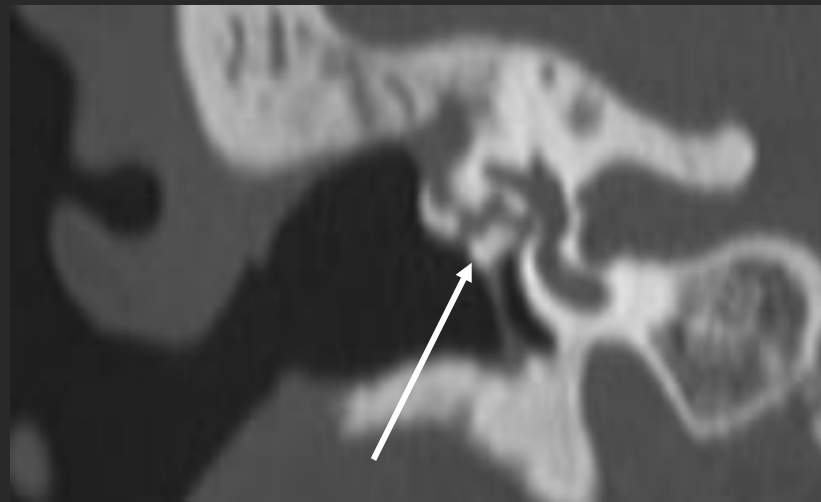
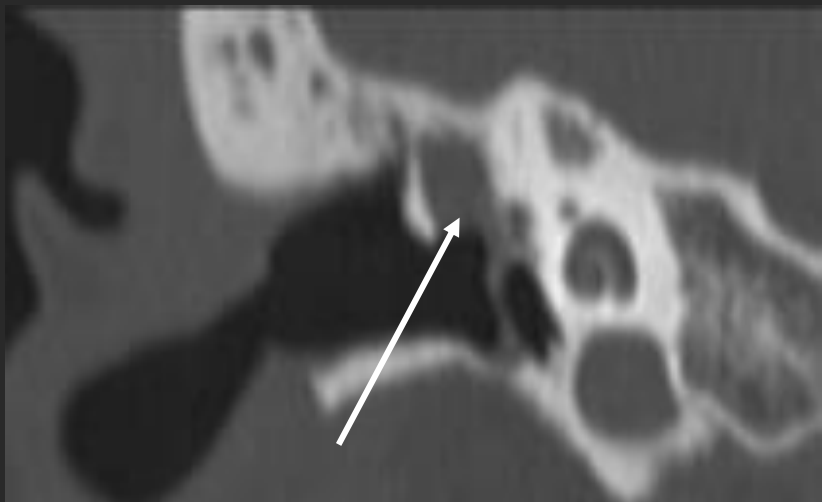


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慢性中耳炎併膽脂瘤

Chronic Otitis Media with Cholesteatoma



慢性中耳炎/膽脂瘤

細菌學

急性中耳炎耳漏

- (1)肺炎鏈球菌(*Streptococcus pneumoniae*)
- (2)流感嗜血桿菌(*Hemophilus influenza*)
- (3)卡他莫拉菌(*Moraxella catarrhalis*)
- (4) A型鏈球菌(*Gr. A Streptococcus*)



慢性中耳炎/膽脂瘤

細菌學

慢性化膿性中耳炎耳漏

混合需氧菌和厭氧菌

- (1) 綠膿桿菌 (*Pseudomonas aeruginosa*)
- (2) 金黃葡萄球菌 (*Staphylococcus aureus* and *epidermidis*)
- (3) 變形桿菌 (*Proteus*), 克雷伯菌 (*Klebsilla*), 大腸桿菌 (*E. coli*)
- (4) 厭氧菌: 擬桿菌 (*Bacteroides fragilis*), 消化球菌 (*Peptococcus*)



慢性中耳炎/膽脂瘤

細菌學

慢性耳漏

Chen & Chen (2009 台耳醫誌)

細菌培養: 76%(63/83) 1+, 10%(8/83) 2+, 14%(12/83) -

(1) Staphylococcus sp.	31
(2) Pseudomonas aeruginosa	23
(3) Candida	6
(4) Aspergillus	5
(5) Klebsiella pneumonia	2
(6) Corynebacterium	2
(7) Proteus mirabilis	1



慢性中耳炎/膽脂瘤

細菌學

顱內膿瘍(Intracranial Abscesses)

- (1) 鏈球菌(*Streptococcus* sp.)
- (2) 葡萄球菌(*Staphylococcus* sp.)
- (3) 變形桿菌(*Proteus*)
- (4) 厭氧菌(Anaerobic): 消化球菌(*Peptococcus*), 擬桿菌(*Bacteroides fragilis*)



慢性中耳炎/膽脂瘤

併發症

合併乳突炎 Coalescence mastoiditis

顱外併發症 (Extracranial complications)

顱內併發症 (Intracranial complications)



慢性中耳炎/膽脂瘤

併發症

- 顱外併發症(Extracranial complications)
 - 化膿性迷路炎(Suppurative labyrinthitis)
 - 迷路瘻管(Labyrinthine fistula)
 - 面神經麻痺(Facial nerve paralysis)
 - 耳後膿瘍(Postauricular abscesses)
 - Bezold氏膿瘍(Bezold's abscesses)
 - 顱骨岩部尖炎(Petrositis)
 - 聽小骨腐蝕(Erosion of ossicles)
 - 膽脂瘤(Cholesteatoma)
 - 感音性聽損(Sensorineural hearing loss)

慢性中耳炎/膽脂瘤

併發症

顱內併發症 (Intracranial complications)

- 硬腦膜外膿瘍 (epidural abscesses)
- 硬腦膜下膿瘍 (subdural abscesses)
- 腦膜下膿瘍 (brain abscesses)
- 耳炎性腦膜炎 (otitic meningitis)
- 耳炎性腦水腫 (otitic hydrocephalus)
- 腦膜靜脈竇血栓性靜脈炎 (thrombophlebitis of the dural venous sinuses)



中耳乳突腔壓力調節

中耳乳突腔壓力調節

耳咽管功能：

1. 通氣(壓力調節)

(ventilation, pressure regulation)

2. 保護

(protection)

3. 排泄、引流

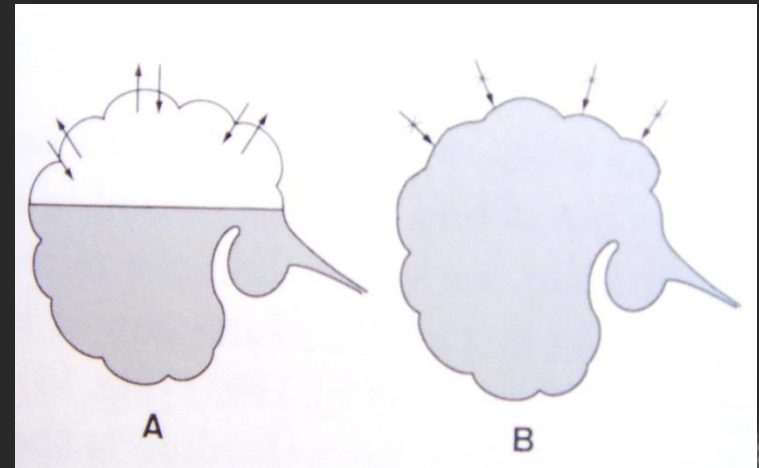
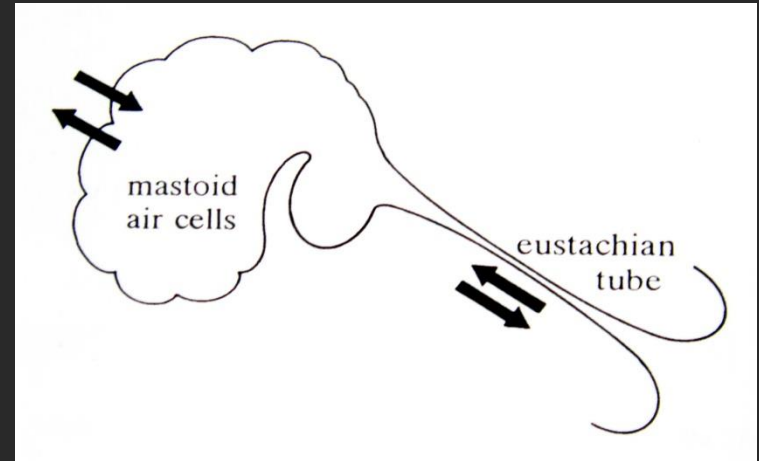
(clearance, drainage)



中耳乳突腔壓力調節

中耳乳突腔壓力調節

- 耳咽管通氣
(E-tube ventilation)
- 經黏膜氣體交換
(transmucosal gas exchange)



中耳乳突腔壓力調節

中耳乳突腔壓力調節

耳咽管功能評估：

充氣-放氣測試 (inflation-deflation test)

1. 正開啟壓和正殘餘壓

(positive opening pressure and residual pressure)

2. 負開啟壓和負殘餘壓

(negative opening pressure and residual pressure)



鼓室成形手術

手術術式

乳突根治切除術(Radical Mastoidectomy)
無聽力保留(no hearing preservation)

修正式乳突根治切除術(Modified Radical
Mastoidectomy)
聽力保留(hearing preservation)

鼓室成形手術(Tympanoplasty)
聽力重建(hearing reconstruction)



鼓室成形手術

第 I 型: 耳膜 → 槌骨 (malleus)
(no altering ossicular system)

第 II 型: 耳膜 → 砧骨 (IS joint)
(preserving lever mechanism)

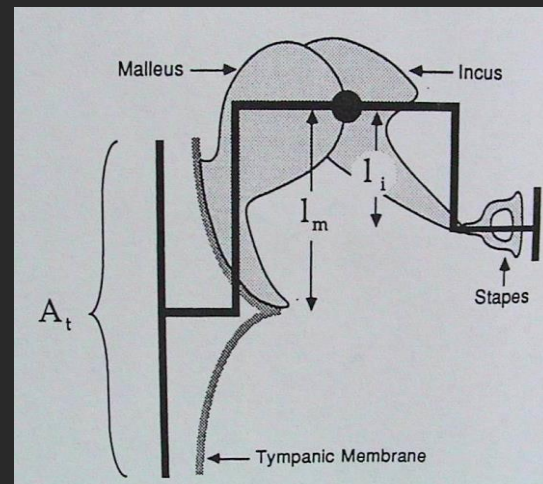
第 III (cIII)* 型: 耳膜 → 鐙骨
(direct transduction to stapes)

第 IV 型: 耳膜 → 鐙骨足板 (footplate of stapes)
(direct connection to mobile footplate)

第 Va 型: 耳膜 → 側半規管窗 (fenestra of lat. scc)

第 Vb 型: 耳膜 → 卵圓窗 (oval window)

***columella (modified Type):** stapes columella,
minor columella, major columella



鼓室成形手術

Tympanoplasty Type II

preservation of integrity of the malleo-incudal lever mechanism

- to restore the lever mechanism of ossicles with interposition of bone graft or prosthesis (e.g., IS joint defect)
- to repair drum +/-



鼓室成形手術

Tympanoplasty Type III

no preservation of integrity of the malleo-incudal lever mechanism

- to restore sound conduction to OW

(i) stapes columella

drum(graft)→head of intact stapes

(ii) minor columella

drum/manubrium←ossicle graft (PORP)→
head of stapes

(iii) major columella (TORP)

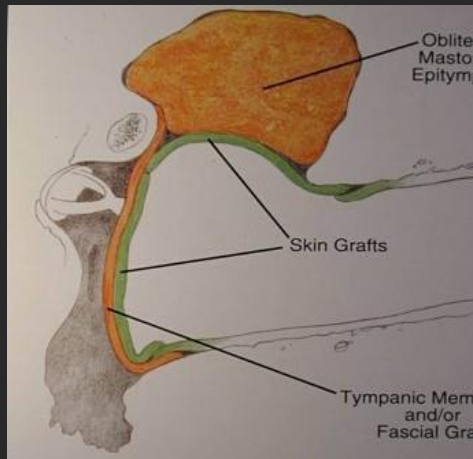
drum/manubrium←ossicle graft (TORP)→
footplate of stapes



鼓室成形手術

Tympanoplasty Type III

- to restore sound conduction to OW
 - (i) stapes columella
drum(graft)→head of intact stapes



Type III-stapes



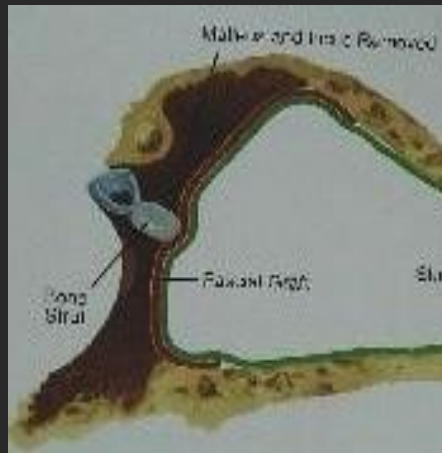
鼓室成形手術

Tympanoplasty Type III

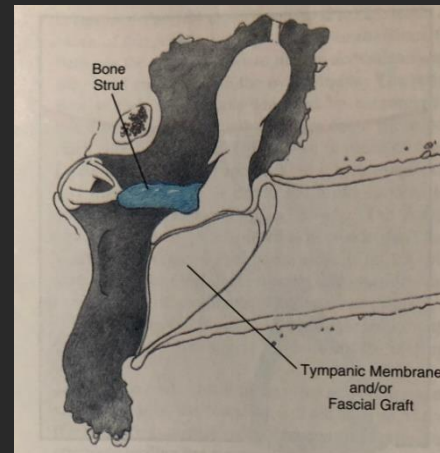
to restore sound conduction to OW

(ii) minor columella (PORP)

drum/manubrium ← ossicle graft →
head of stapes



Type III-minor



Type III-minor



PORP

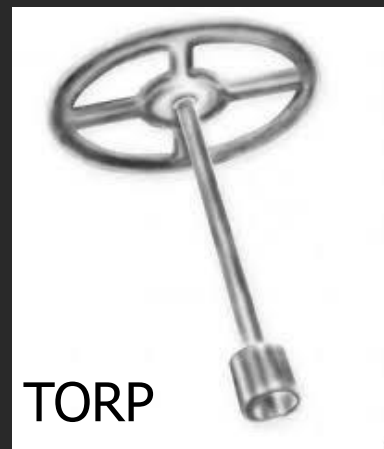
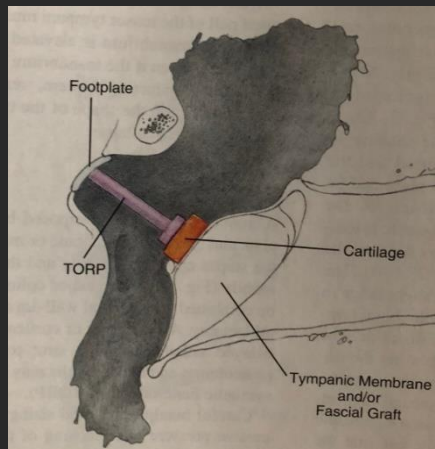
鼓室成形手術

Tympanoplasty Type III

to restore sound conduction to OW

(iii) major columella (TORP)*

drum/manubrium ← ossicle graft →
footplate of stapes



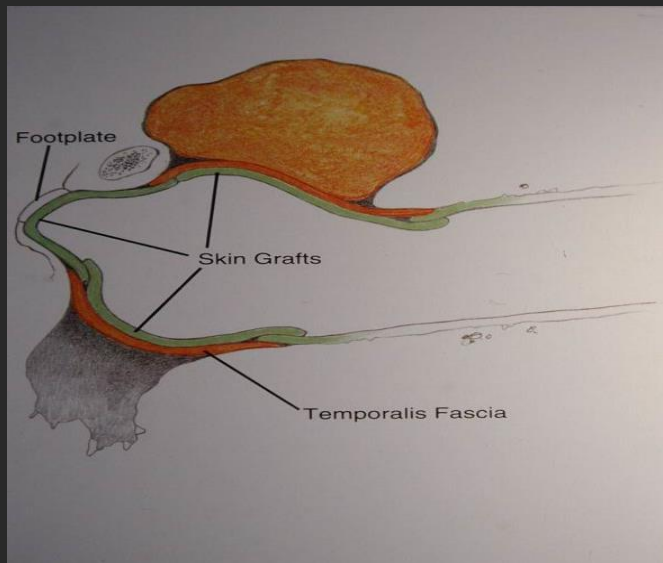
Type III-major



鼓室成形手術

Tympanoplasty Type IV

- to restore sound conduction to OW
incoming sound → footplate of stapes



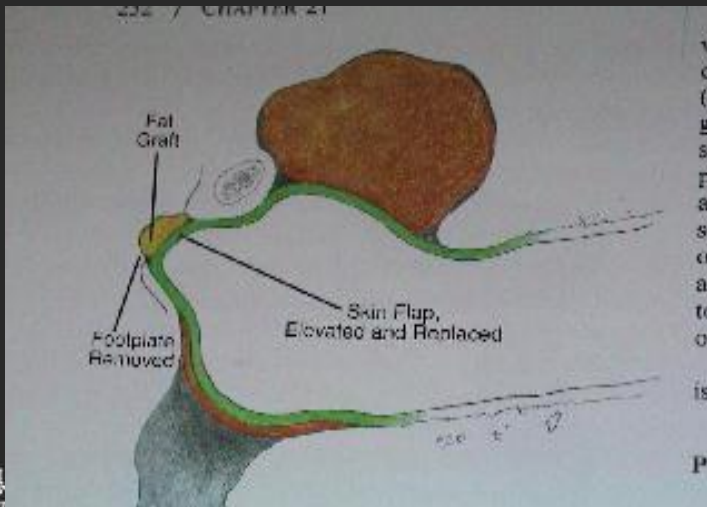
鼓室成形手術

Tympanoplasty Type V

to bypass ankylosed footplate of stapes

(i) Va: drum/graft → fenestration of lateral S.C.C.

(ii) Vb: drum/graft → soft tissue graft on O.W.
(footplate removed)



鼓室成形手術

Tympanoplasty Type 0

- to explore middle ear/mastoid
- to eradicate pathologic tissues
- repair of drum +/-
- **no restoration of sound conduction**



鼓室成形手術

手術目的

- 根除中耳和乳突疾病(安全耳，safe ear)
- 無耳漏(乾燥耳，dry ear)
- 重建聽小骨傳音功能(改善聽力，hearing improvement)
- 重建後、上骨性外耳道(正常解剖構造，normal anatomy)



鼓室成形手術

要點

1. 適當且夠大的術野
2. 完全清除病竈(膽脂瘤和肉芽)
3. 修補耳膜
4. 聽小骨鏈重建
5. 重建外耳道後壁
6. 恢復通氣系統



鼓室成形手術

決定手術式的因素

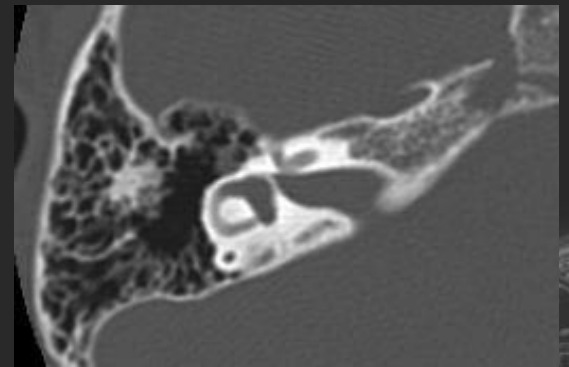
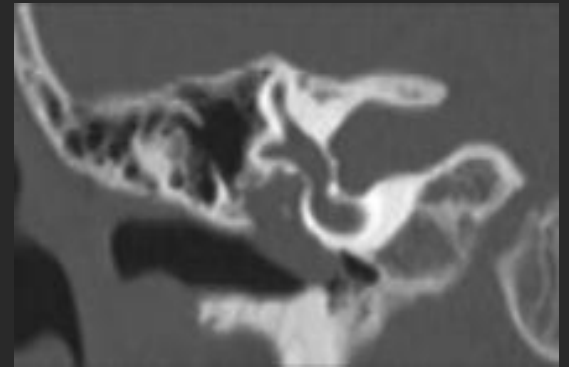
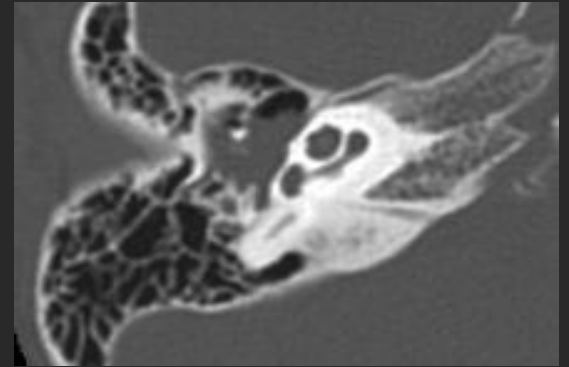
- 顛骨解剖
- 病變範圍
- 聽小骨鏈破壞程度
- 面神經管和半規管的狀況
- 耳咽管(E-tube)的狀況
- 鼓室及乳突充氣的情形
- 中耳乳突粘膜病變



鼓室成形手術

閉鎖或開放？

1. 乳突氣化
2. 鼓室及乳突充氣情形
3. 上鼓室粘膜保存



鼓室成形手術

技術

1. 閉鎖式

(Canal wall up technique,
Closed cavity)

2. 開放式

(Canal wall down technique,
Open cavity)

3. 外耳道重建

(Reconstruction of external
ear canal/bony defect)



鼓室成形手術

技術

1. 閉鎖式 (Canal wall up technique, Closed cavity)

適應症：

鼓室或上鼓室和乳突竇的較小病變

乳突氣化良好

鼓室及乳突充氣良好

耳咽管功能良好

耳膜和聽小骨可保存



鼓室成形手術

技術

1. 閉鎖式(Canal wall up technique, Closed cavity)

優點：外耳道後壁完整、

聽小骨鏈重建效果較佳

缺點：鼓室竇(sinus tympani)病變不易清除 → 殘存膽脂瘤 → 耳漏(聽損)、耳垢、耳漏



鼓室成形手術

技術

2.開放式(Canal wall down technique, Open cavity)

適應症：

廣範圍的大病變

乳突氣化不良

鼓室及乳突充氣不良

耳咽管功能不良

閉鎖式手術(canal wall up)失敗



鼓室成形手術

技術

2.開放式(Canal wall down technique, Open cavity)

優點：術野最好、完全清除病變
facial ridge低

缺點：痊癒時間較長、聽小骨鏈重建
效果較差(聽損)、耳垢、耳漏



鼓室成形手術

技術

3. 外耳道重建 (Reconstruction of external ear canal/bony defect)

- 筋膜/皮下組織瓣
- 骨片/軟骨片
- 自體游離耳道
- 骨泥
- (hydroxyapatite)



鼓室成形手術

技術

3. 外耳道重建 (Reconstruction of external ear canal/bony defect)

- 上鼓室乳突竇開窗術
→ 上鼓室乳突竇成形術 (Attico-antroplasty)
- 上鼓室開窗術
→ 上鼓室成形術 (Atticoplasty)



鼓室成形手術

中耳乳突腔壓力調節功能

壓力調節功能不良

→中耳乳突充氣不良

→影響鼓室成形手術預後

1.耳膜再穿孔

2.耳膜凹陷袋形成→膽脂瘤生成

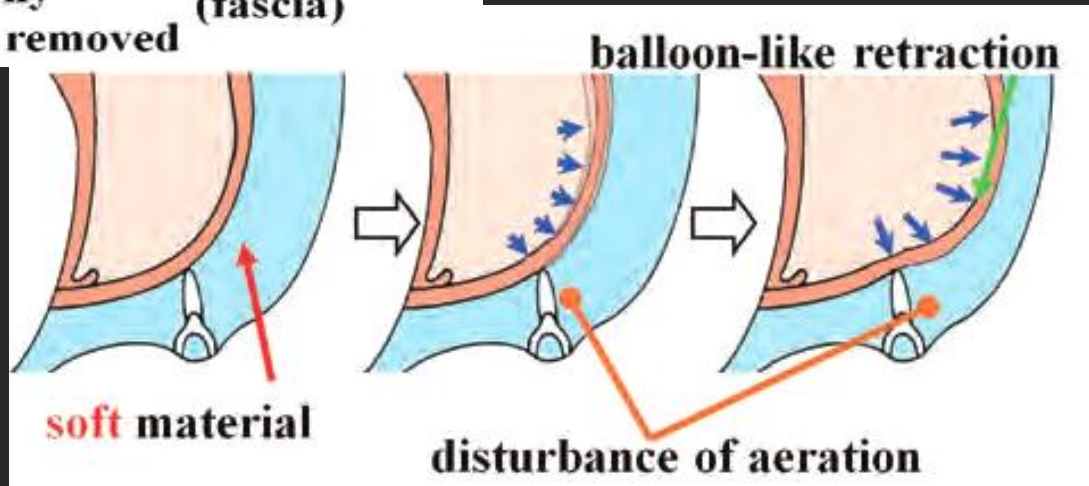
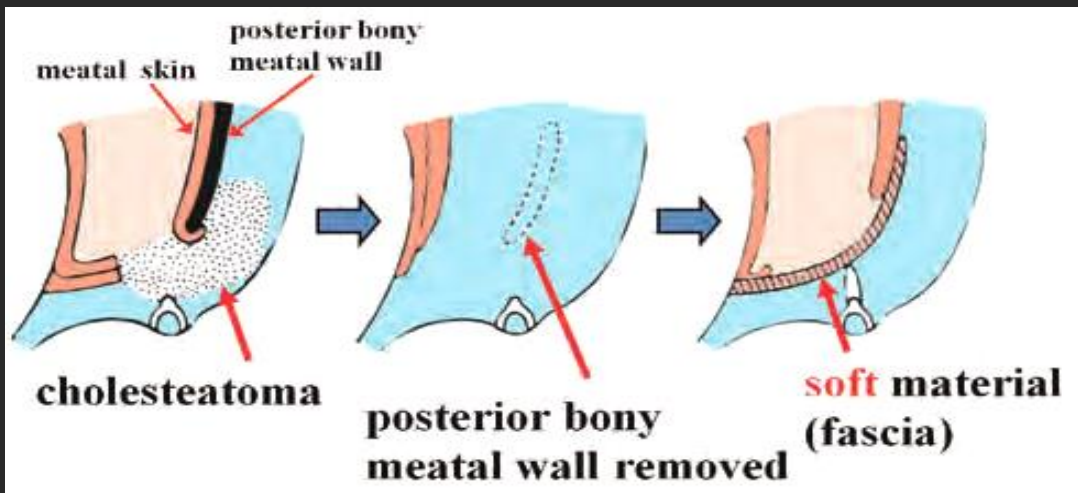
3.人工聽小骨(PORP, TORP)排出



鼓室成形手術

為何使用軟組織重建?

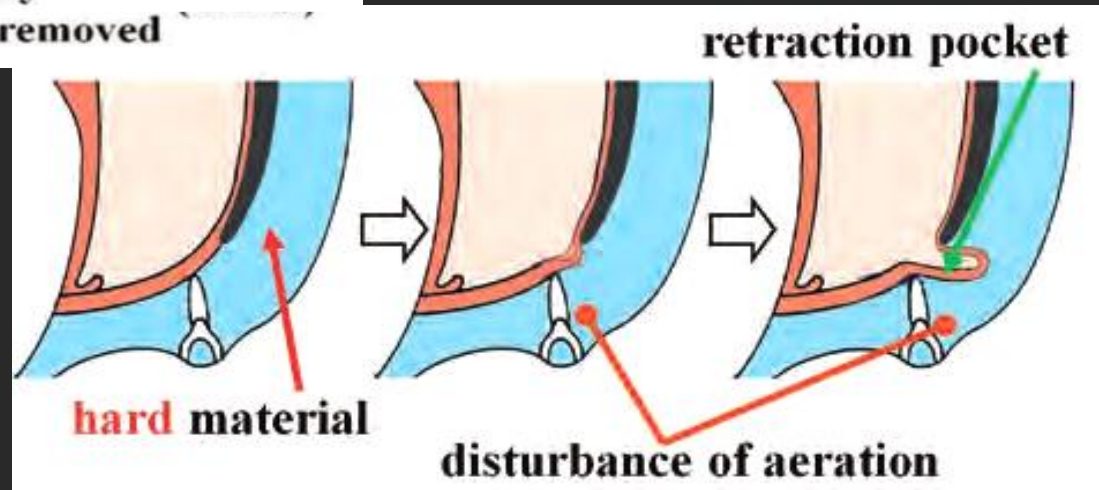
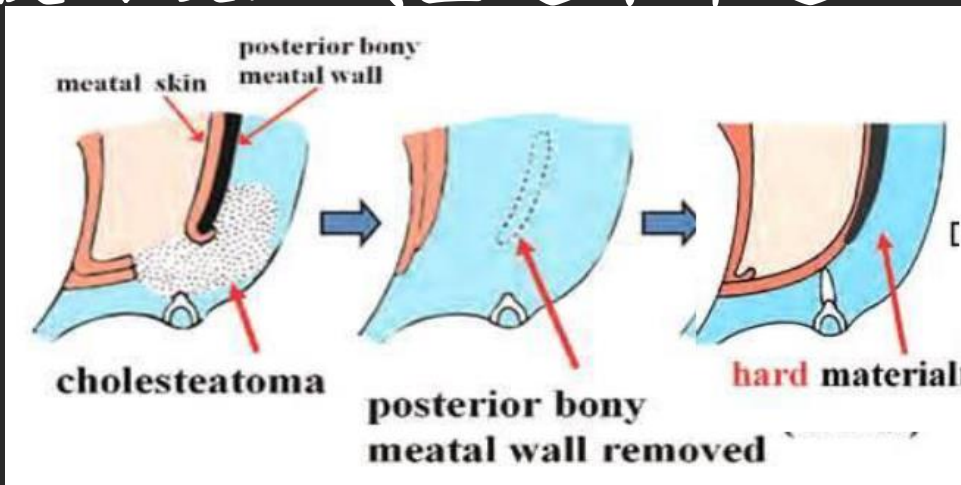
使用軟組織重建



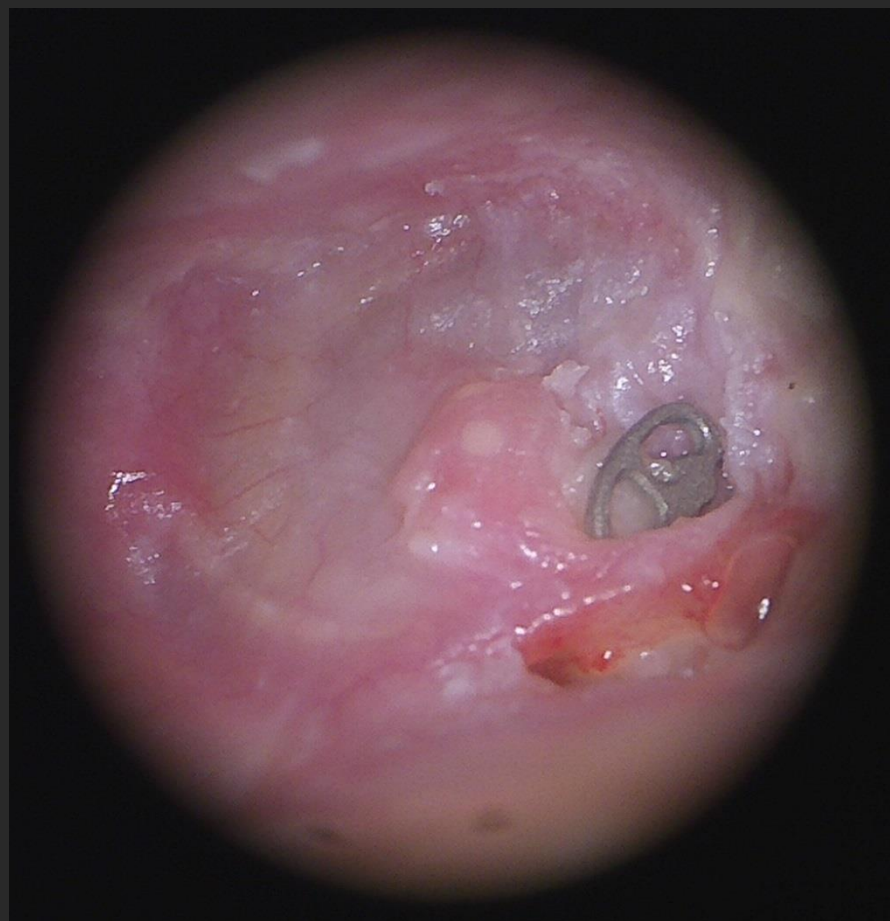
鼓室成形手術

為何使用軟組織重建?

使用硬組織重建外耳道



人工聽小骨(PORP, TORP)排出



Outcomes of Tympanoplasty

韓國耳科醫學會(2007)

聽力改善成功 A

- (1) 聽力改善(Hearing gain) $\geq 15\text{dB}$
- (2) 氣骨導差(Air-Bone gap) $\leq 20\text{dB}$
- (3) 氣導純音平均聽閾(PTA) $\leq 30\text{dB}$

聽力改善成功 B

術後 Air-Bone gap

非常好(Excellent)	$\leq 10\text{dB}$
良好(Good)	11~20dB
無改善(No improvement)	21~30dB
很差(Poor)	$\geq 31\text{dB}$



Outcomes of Tympanoplasty

日本耳科醫學會(2010)

聽力改善成功 A

- (1) 聽力改善(Hearing gain) $\geq 15\text{dB}$
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Outcomes of Tympanoplasty

美國耳鼻喉頭頸外科醫學會(1995)

聽力改善成功 A

術後氣骨導差(Air-Bone gap)

非常好(Excellent) $\leq 10\text{dB}$

良好(Good) 11~20dB

無改善(No improvement) 21~30dB

很差(Poor) $\geq 31\text{dB}$

聽力改善成功 B

術後氣骨導差改善(Closure of Air-Bone gap)



鼓室成形手術式

傷口癒合

術式	閉鎖(重建)式		開放式 (n=9)
	Closed BFS (n=7)	Closed FS (n=5)	
均值(天)	37.0±11.2	28.0±10.6	71.8±45.6

ANOVA, $p=0.027$

Post-hoc with Bonferroni: BFS vs FS, $p=0.042$



鼓室成形手術式

Operative Method:

Tympanoplasty (columella) type
with atticotomy / antrotomy / atticoantrotomy /
CWD mastoidectomy and reconstruction of
posterior ear canal, right / left



鼓室成形手術式

Operative Findings:

Perforation size % / Retraction pocket ()

Pathologic tissue (): _____

Ossicular chain fixation() or defect() at:

Middle ear cavity mucosa: OK()/edematous()
/granular()/adhesive()/tympanosclerotic()

E tube orifice: OK()/edematous()/granular()
/occluded()/not check()

Cholesteatoma () at: Mesotympanum()
/Protympanum()/Retrotympanum()/ Attic()
/Mastoid()



鼓室成形手術式

Operative Procedure:

- 1.Skin incision:endaural()/postauricular()/transcanal()
- 2.Harvest of areolar tissue graft()/temporalis fascia()
- 3.Subcutaneous soft tissue management:
Curvilinear-incision()/T-incision()/M-incision();
Pedicle flaps()—superiorly()/inferiorly()
/posteriorly-based()
- 4.Developing vascular strip()/ Transcanal incision and elevation of soft tissue of posterior ext. ear canal ()
- 5.Denuding perforation edge()
- 6.Raise tympanomeatal flap()with swing-door fashion()



鼓室成形手術式

Operative Procedure:

7. Bone work(): ear canal widening()/antrotomy()/
atticotomy()/atticoantrotomy()/
atticomastoidectomy()

/tympanomastoidectomyCWD()/CWU()

8. Facial Bridge: preserved()/broken-down()

9. Patency of atticoantral route(), Patency of E-tube()

10. Removal of pathologic tissue(): granulation tissue()
, tympanosclerotic plaque(), cholesteatoma()
from _____

11. Reconstruction of ossicular chain (): TORP()/PORP()
/interposition()/columella() with malleus A()/H() or
incus A()/H()



鼓室成形手術式

Operative Procedure:

12. Reconstruction()/Obliteration(): bony defect of external ear canal()/attic ()/mastoid cavity() with cartilage()/cortical bone()/pedicle flap()/ soft tissue of posterior external ear canal () by antroplasty()/ atticoplasty()/ atticoantroplasty()
13. TM grafting with underlay()/sandwich()/overlay()
14. Gelfoam packing of middle ear(); ear canal()with Sofradex()/Tarivid()
15. Skin closure: two layer(), Penrose tube insertion() with mastoid dressing



鼓室成形手術式

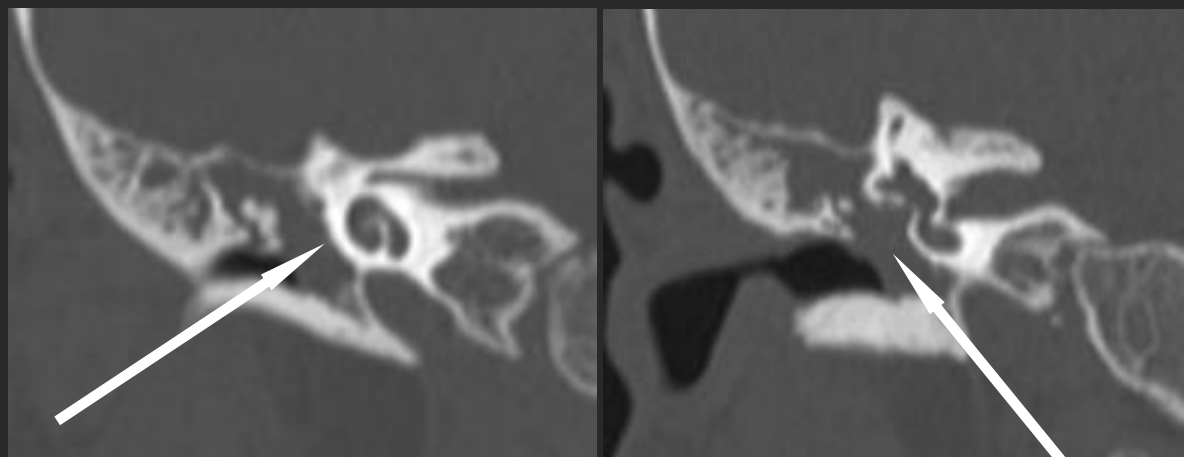
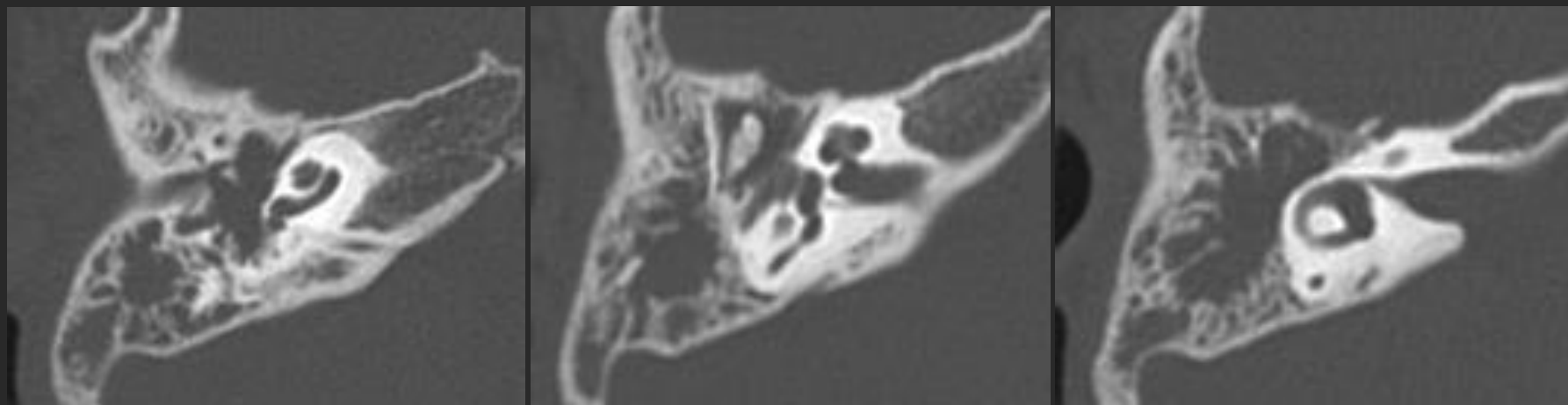
Operative Procedure:

16. Other remarks: chorda tympani preservation()
transection of tensor tympani tendon(), stapedius
tendon()
possibility of residual cholesteatoma() at _____
spontaneous facial nerve exposure() at tympanic()
/mastoid()/ geniculate ganglion()
dura exposure() at tympanic()/Mastoid()
sigmoid sinus exposure() at _____
use of silastic sheet in middle ear() No. _____



膽脂瘤手術

#526xxx ♂ 6y2m (2001/11/28)

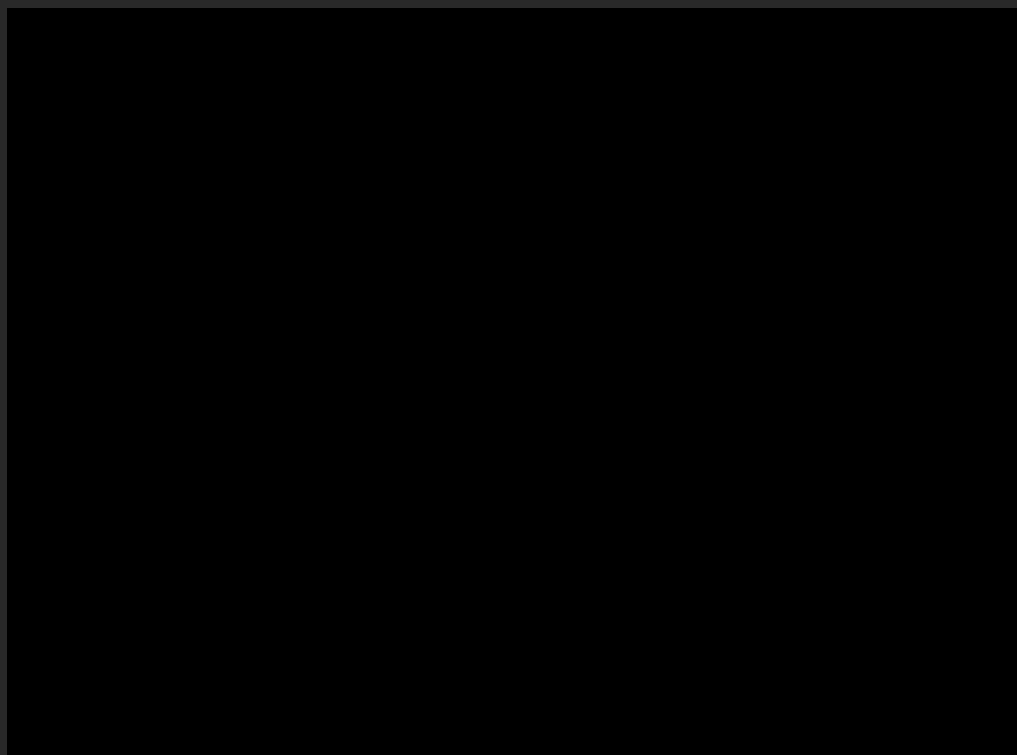


膽脂瘤手術

#526xxxx ♂ 6y2m (2001/11/28)

Congenital cholesteatoma

2008/02/14 cIV+AAP(BFS), Rt

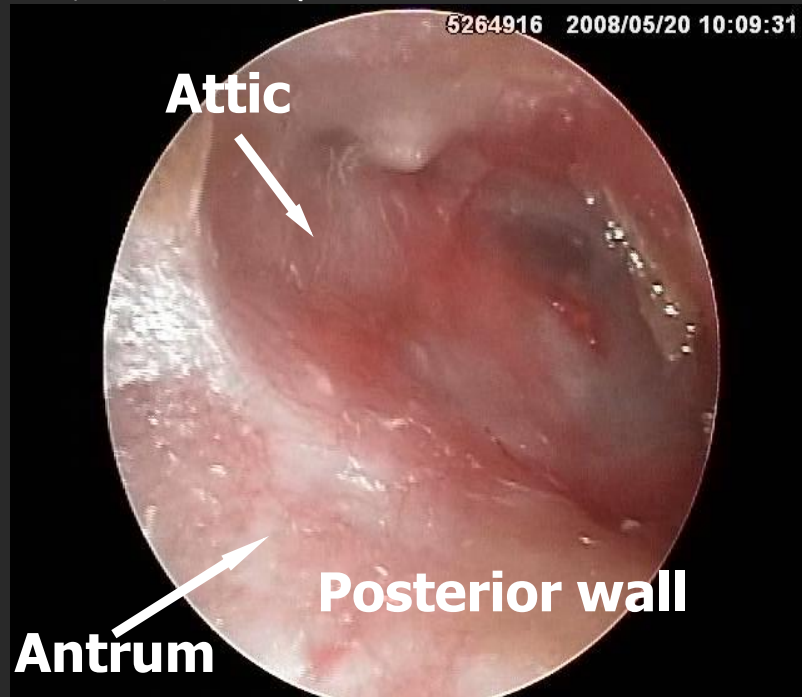


膽脂瘤手術

#526xxxx ♂ 6y2m (2001/11/28)

2008/02/14 cIV+AAP(BFS),Rt

術後 3月



術後 1年

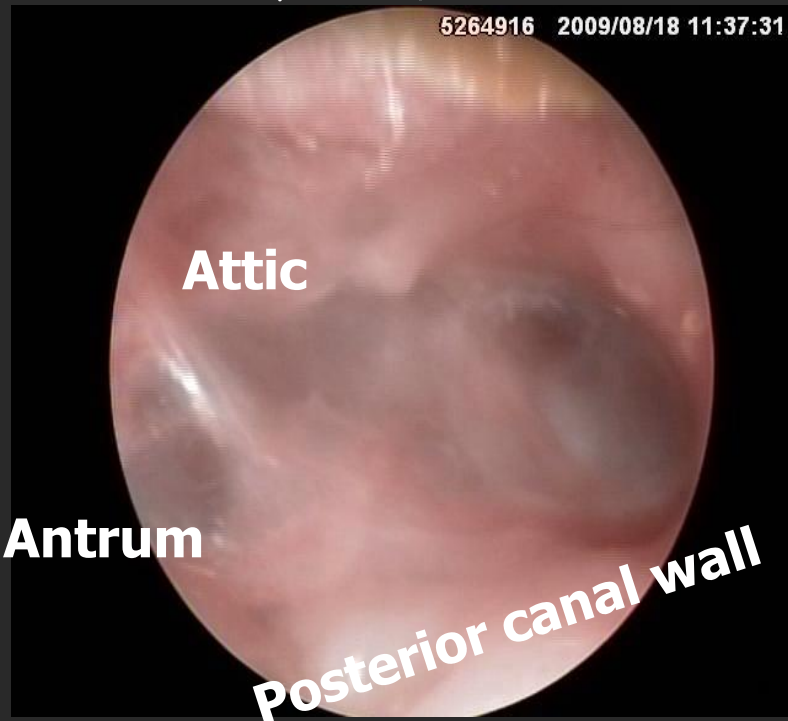


膽脂瘤手術

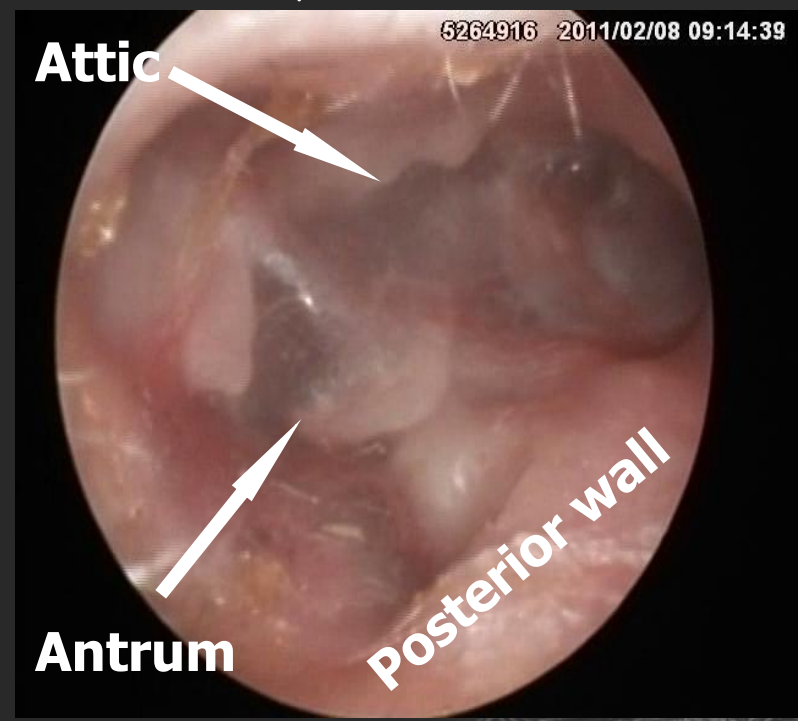
#526xxx ♂ 6y2m (2001/11/28)

2008/02/14 cIV+AAP(BFS),Rt

術後 2年6月

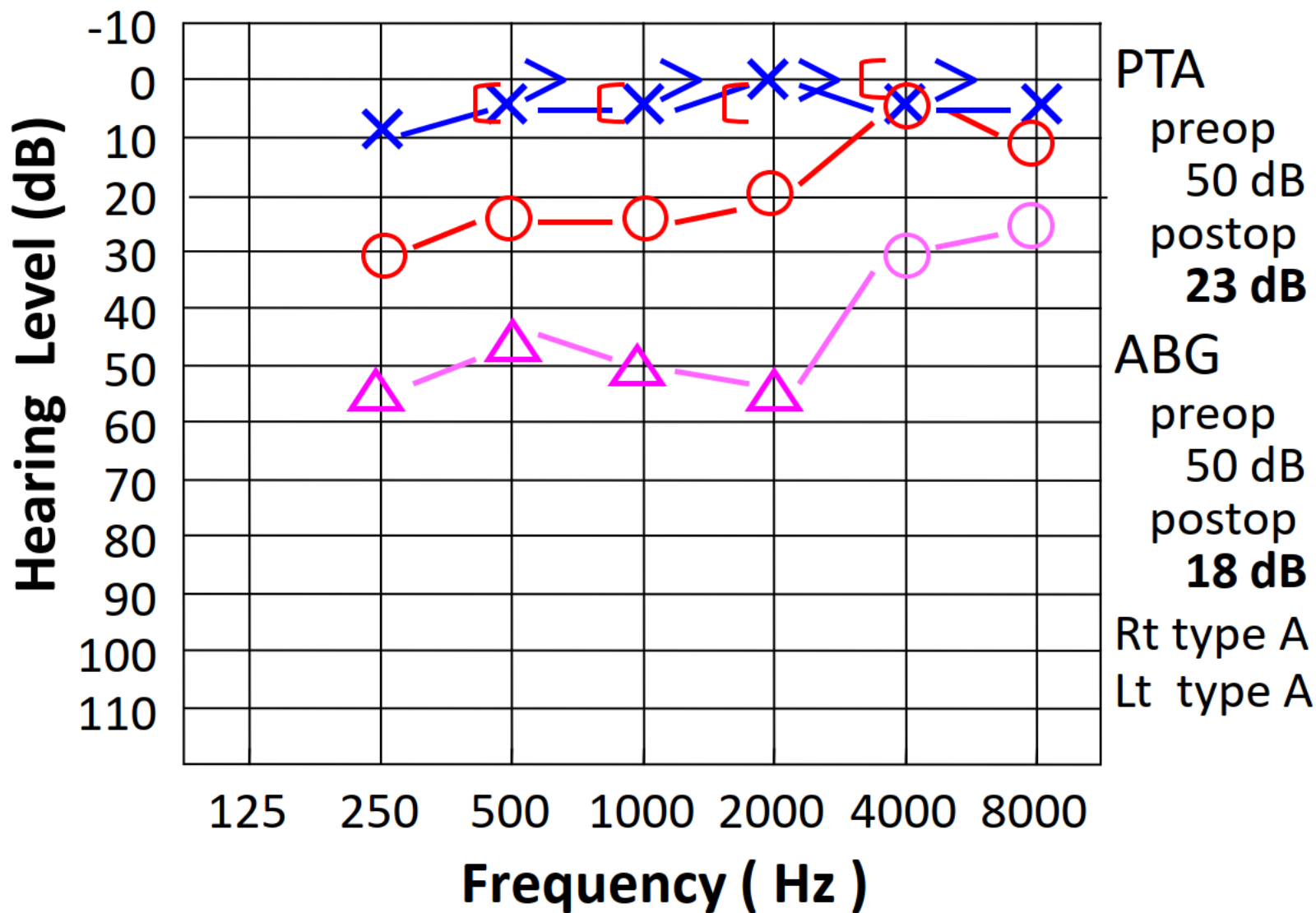


術後 4年



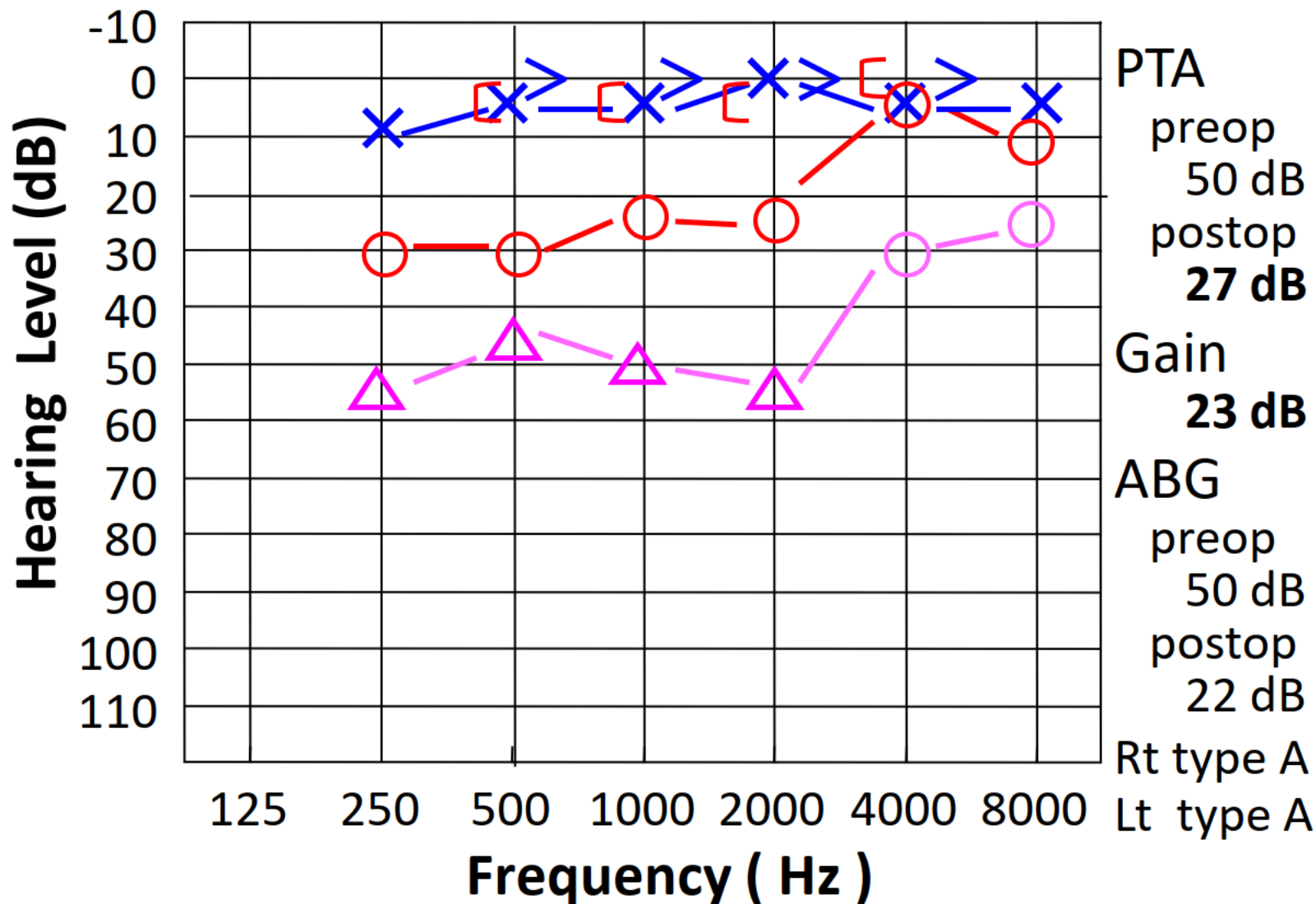
#526xxxx cIV+AAP(BFS),Rt

2010/02/02 postop 2y



#526xxxx cIV+AAP(BFS),Rt

2011/02/08 postop 3y



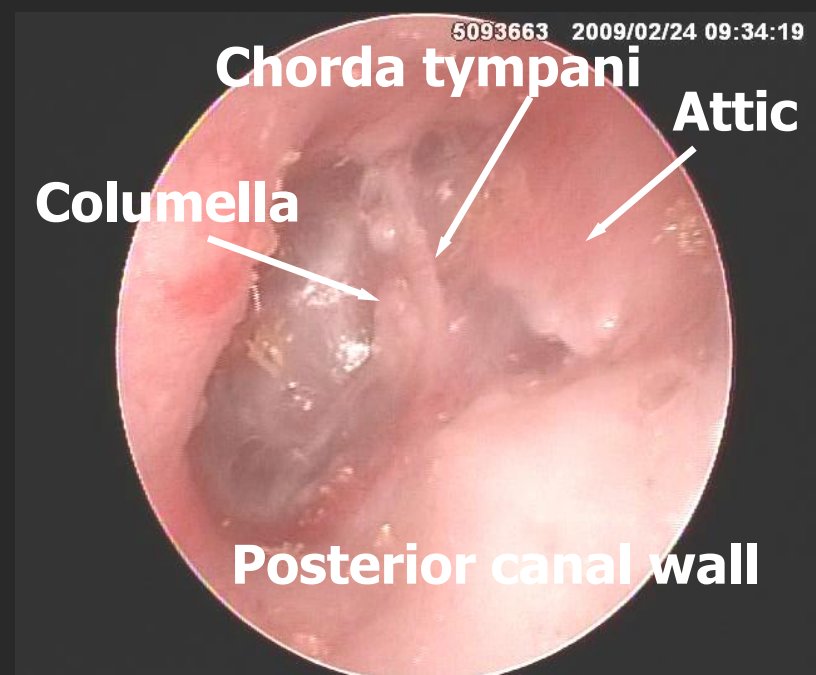
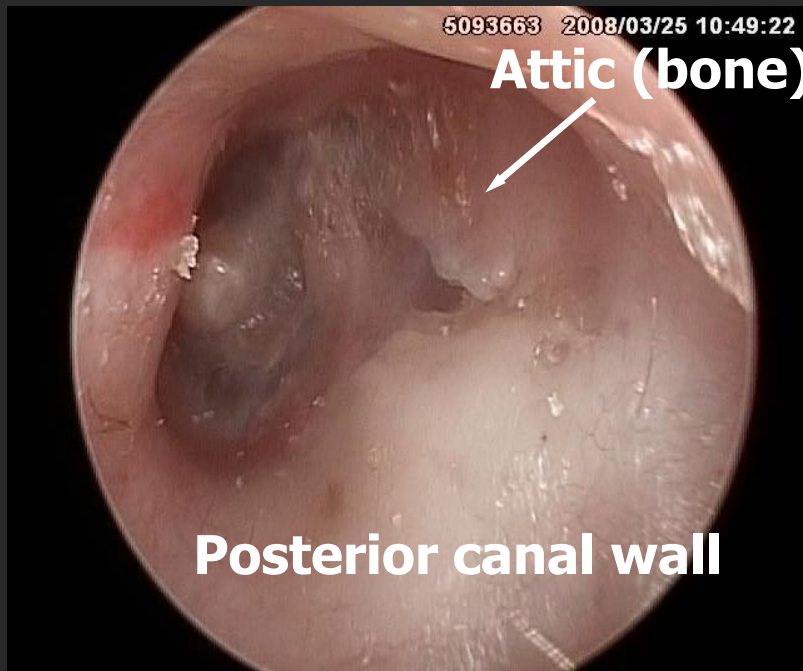
膽脂瘤手術

#509xxxx ♂ 3y10m (2002/12/06)

2006/10/16 cIV+AAP(BFS), 左耳

術後 1年5月

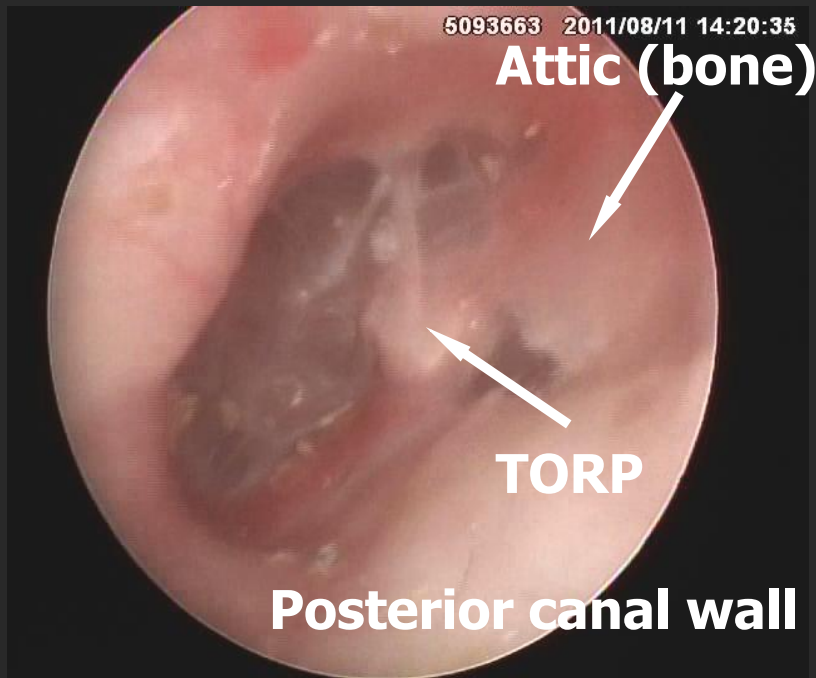
術後 2年4月



膽脂瘤手術

#509xxxx ♂ 3y10m (2002/12/06)

2006/10/16 cIV+AAP(BFS), 左耳
術後 4年10月



膽脂瘤手術

#509xxxx ♂ 3y10m (2002/12/06)

2006/10/16 cIV+AAP(BFS), 左耳
術後 4年4月

PTA: preop 38 dB → postop 30 dB

ABG: preop 30 dB → postop 30 dB

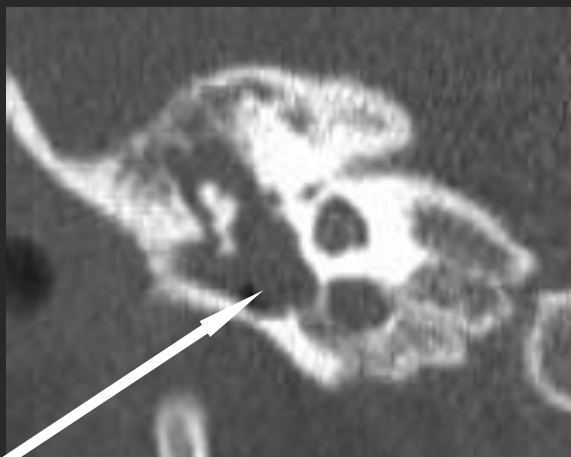
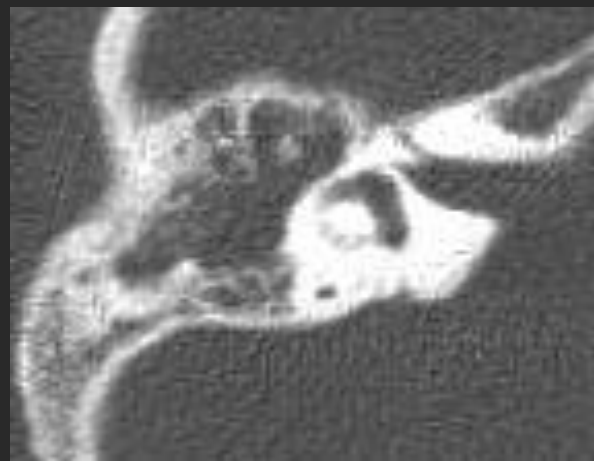
Tympanogram: Rt type A Lt type A



膽脂瘤手術

#518xxxx

♂ 4y3m (2003/03/10)



膽脂瘤手術

#518xxx ♂ 4y3m (2003/03/10)

COM with choleateatoma

2007/06/28 cIV+AAP(FS), Rt



膽脂瘤手術

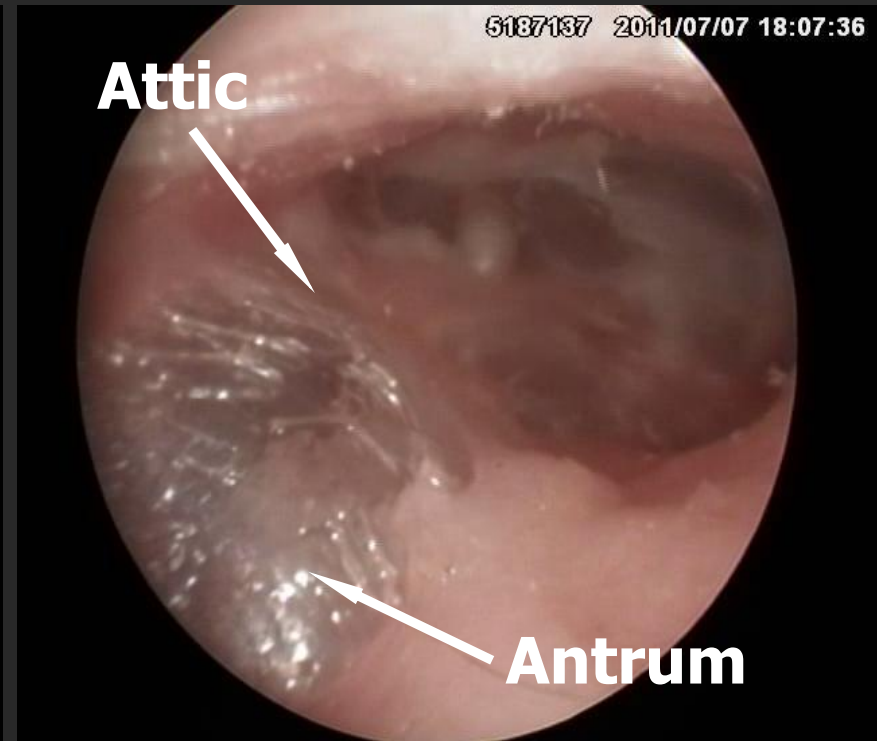
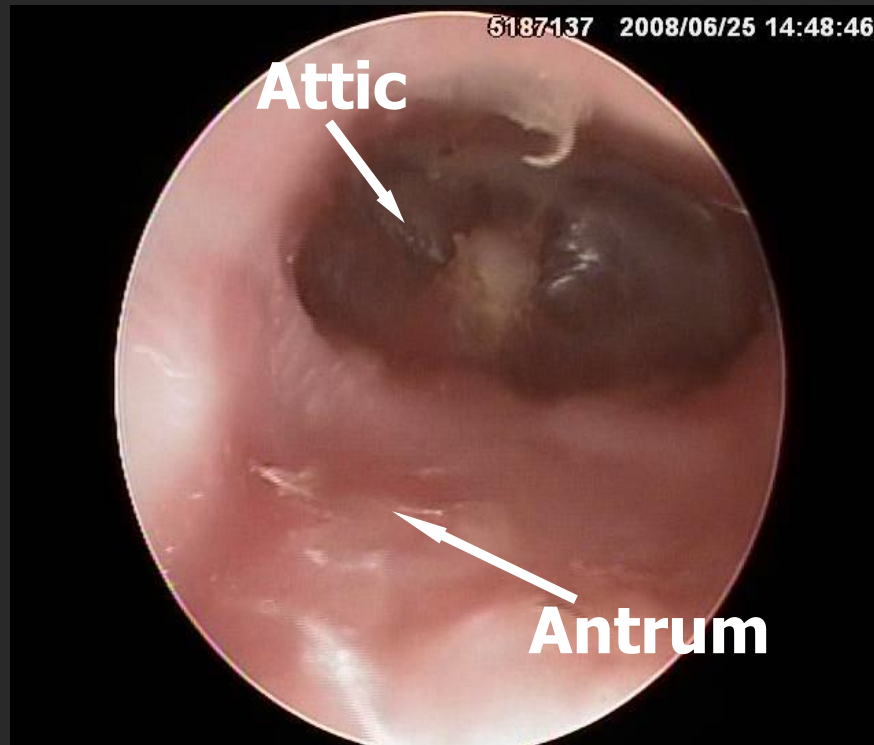
#518xxxx

♂ 4y3m (2003/03/10)

2007/06/28 cIV+AAP(FS), Rt

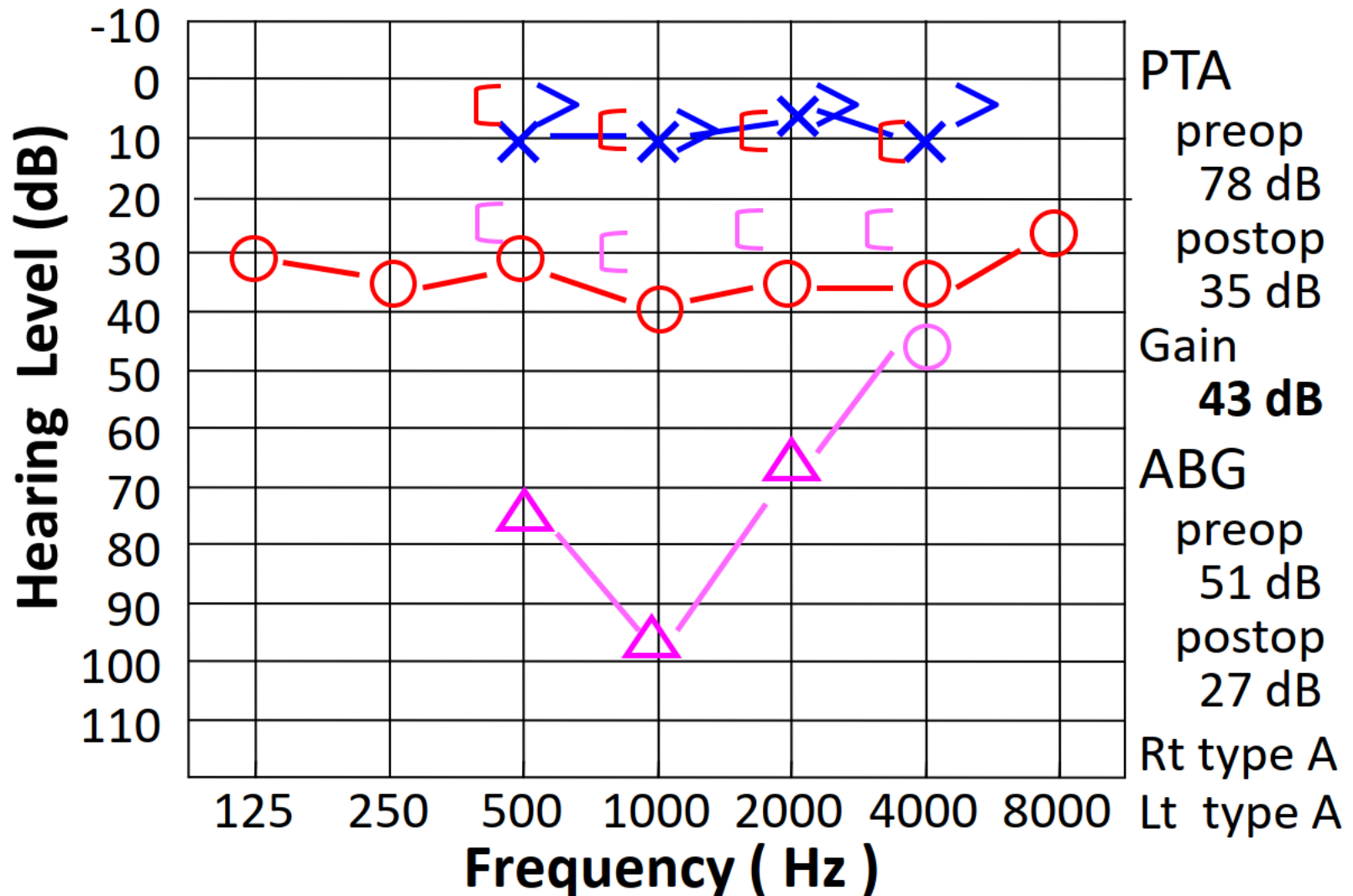
術後 1年

術後 4年

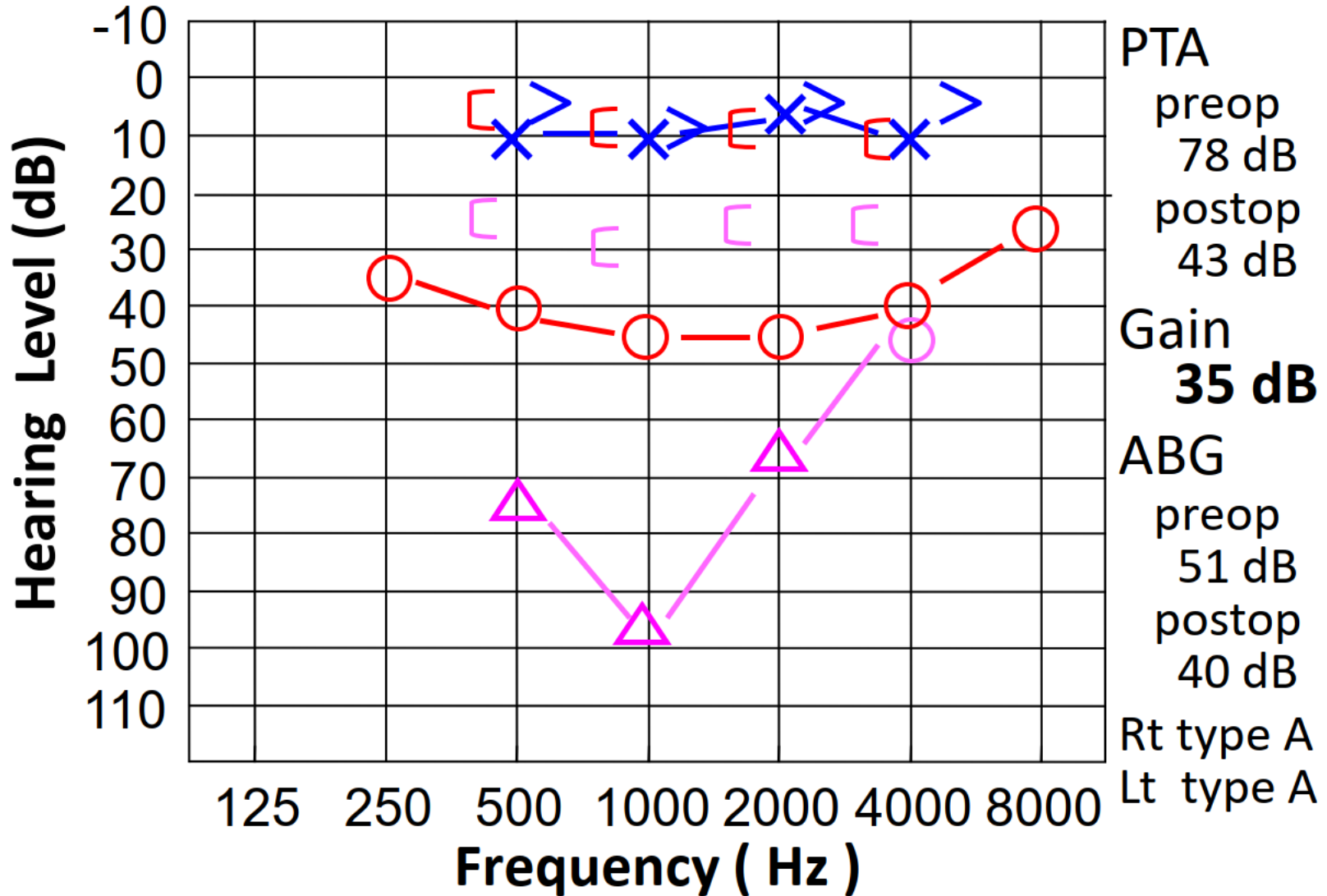


#518xxxx cIV+AAP(FS), Rt

2008/06/25 postop 1y



#518xxxx cIV+AAP(FS),Rt 2011/07/07 postop 4y



膽脂瘤手術

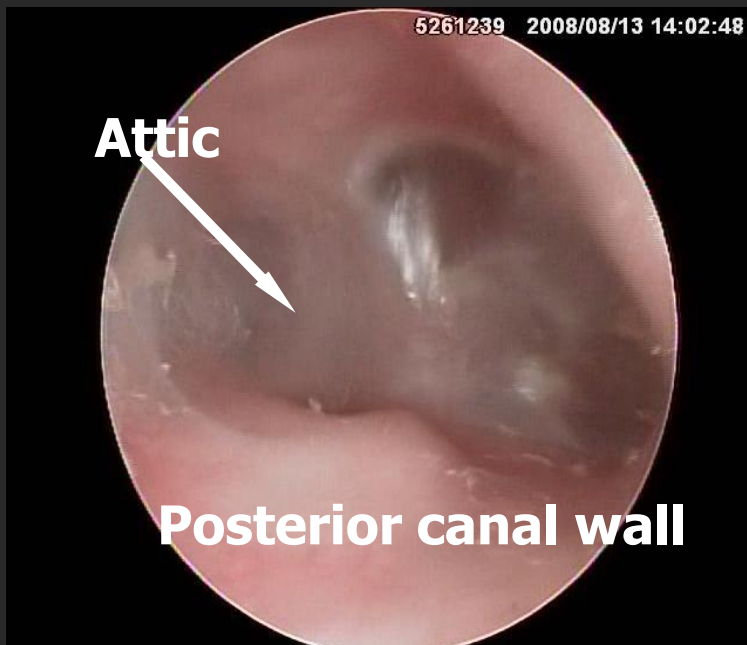
#5261xxx ♂ 7y4m (2000/09/27)

Congenital cholesteatoma

2008/02/18 cIV+AP(FS), Rt

術後 6月

術後 1年2月



膽脂瘤手術

#5261xxx ♂ 7y4m (2000/09/27)

Congenital cholesteatoma

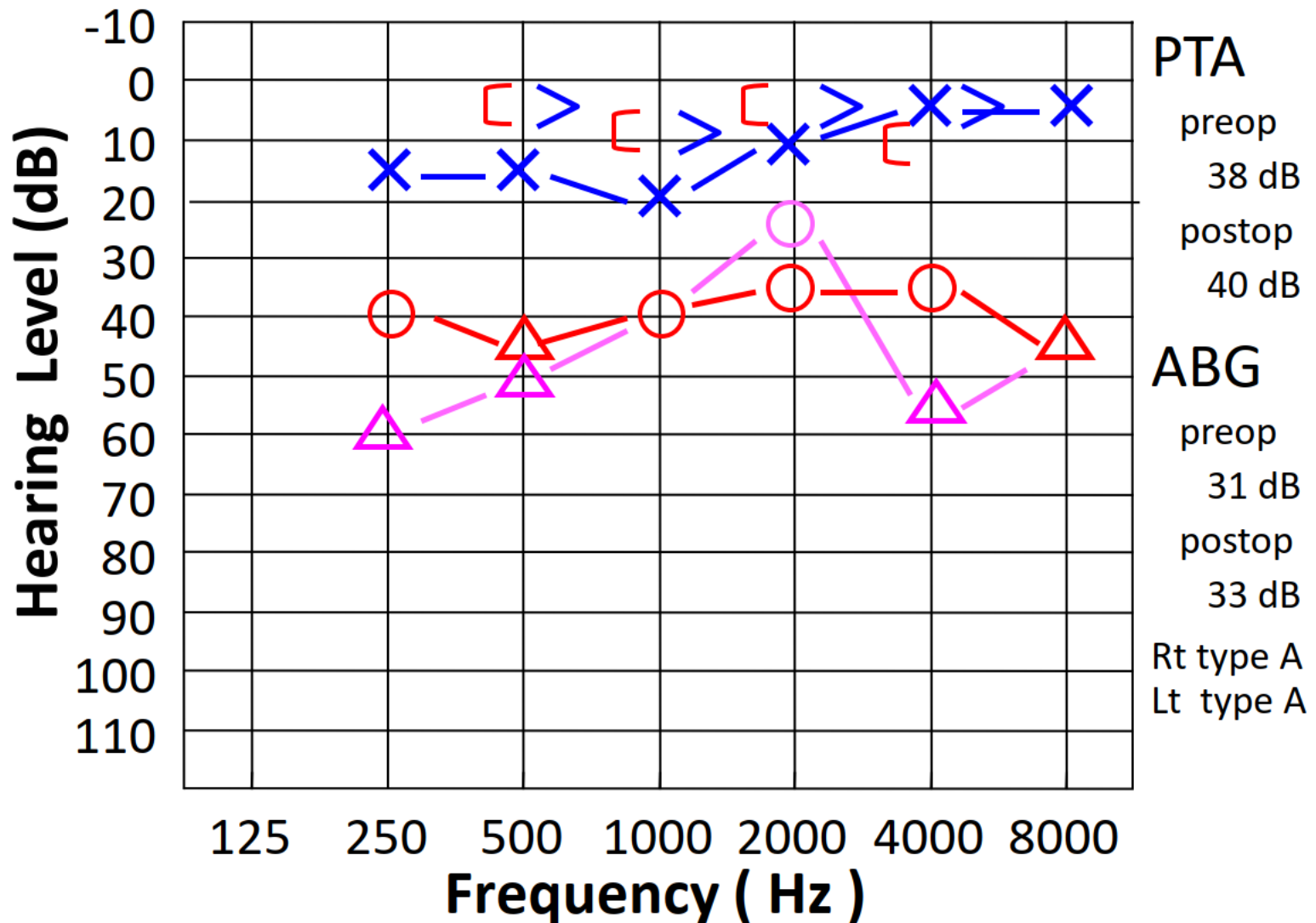
2008/02/18 cIV+AP(FS), Rt

術後 2年4月



#526xxxx cIV+AP(FS),Rt

2010/06/17 postop 2y4m

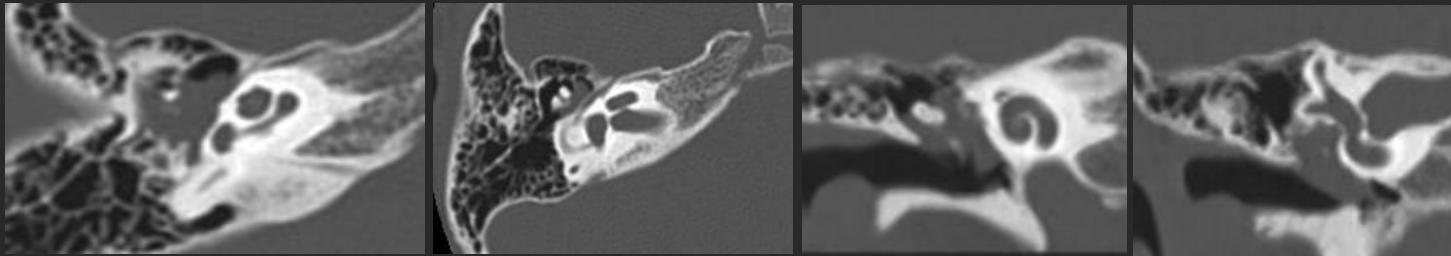


膽脂瘤手術

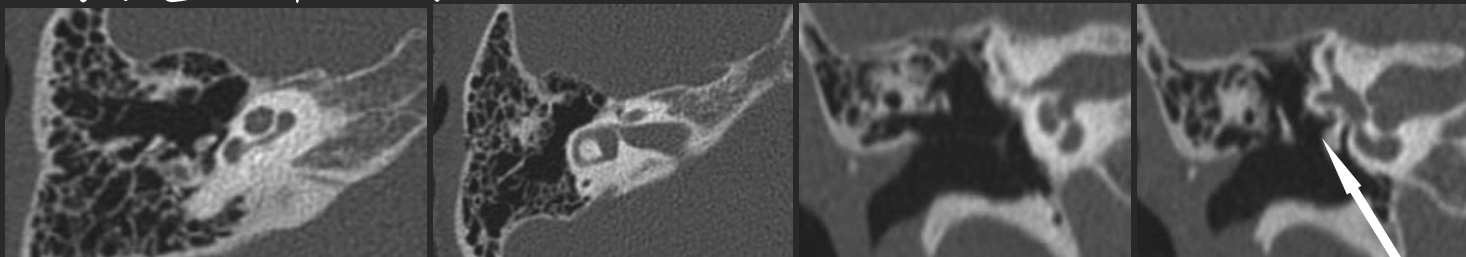
#526xxxx ♂ 7y4m (2000/09/27)

2008/02/18 cIV+AP(FS), Rt

術前



術後 4年2月

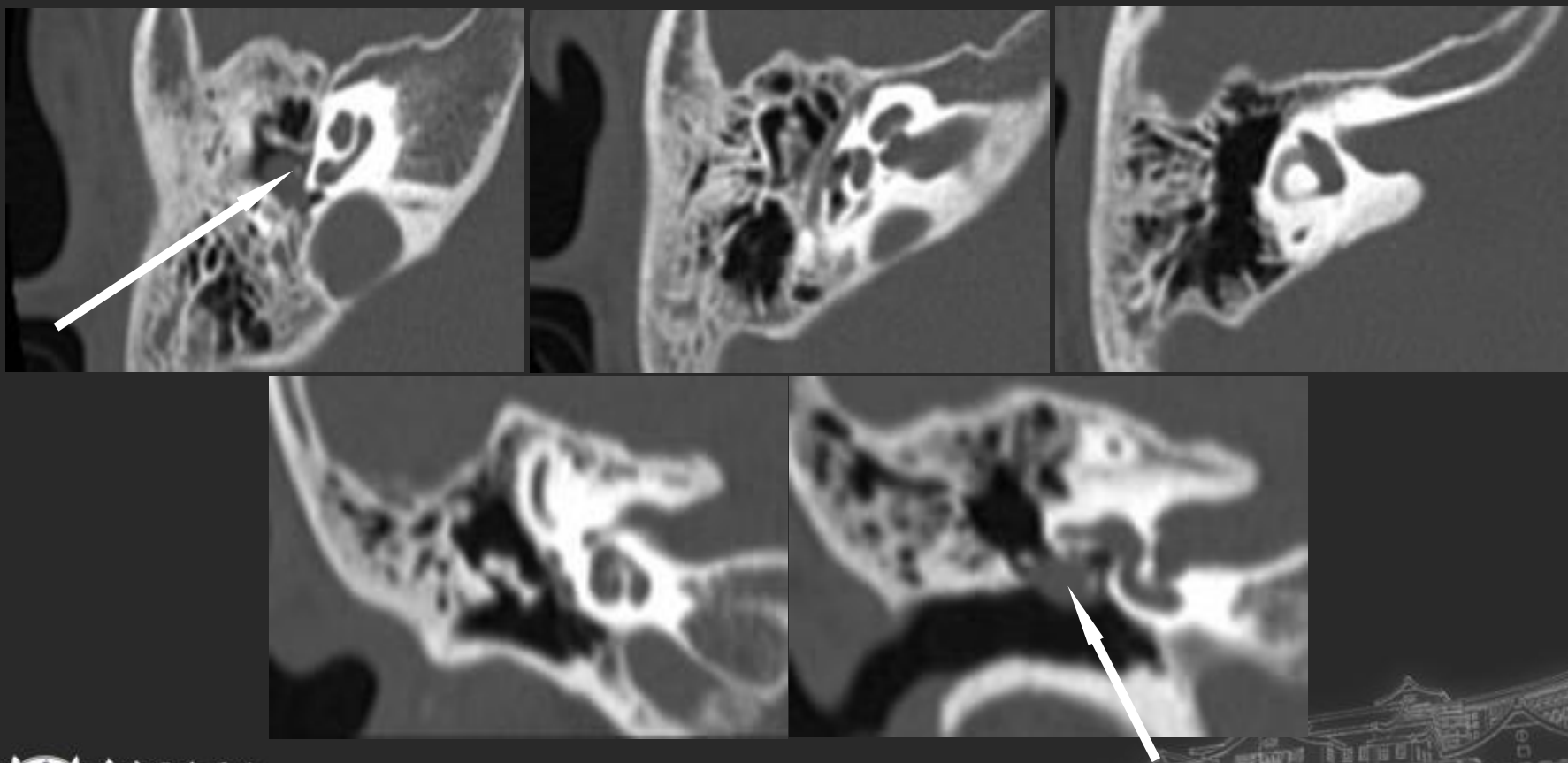


Columella

膽脂瘤手術

#529xxx ♂ 8y5m (2000/09/25)

Congenital cholesteatoma



膽脂瘤手術

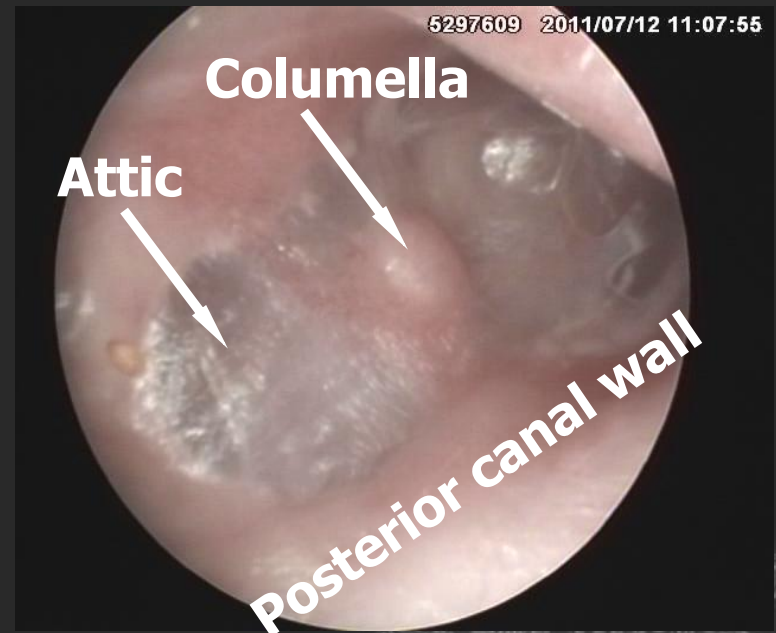
#529xxxx ♂ 8y5m (2000/09/25)

Congenital cholesteatoma

2008/11/27 cIII+AP(FS), rev. Rt

術後 1年5月

術後 2年8月



#529xxxx

Congenital cholesteatoma

cIII+AP(SF), rev., Rt

2008/10/01 (preop)

	Rt	Lt
ABG	10 dB	7 dB
AC	22 dB	10 dB
BC	12 dB	3 dB
Tympanogr	A	A



#529xxxx

Congenital cholesteatoma

cIII+AP(SF), rev., Rt

2011/07/12 (postop 2y8m)

	Rt	Lt
ABG	22 dB	0 dB
AC	27 dB	7 dB
BC	3 dB	0 dB
Tympanogr	Ad	A



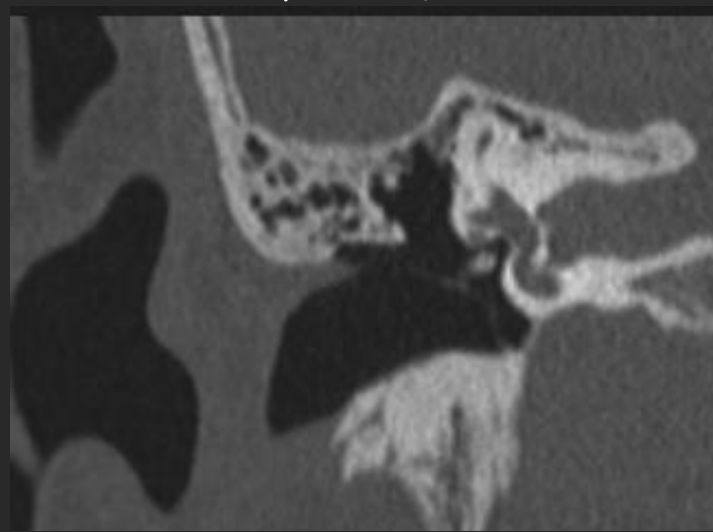
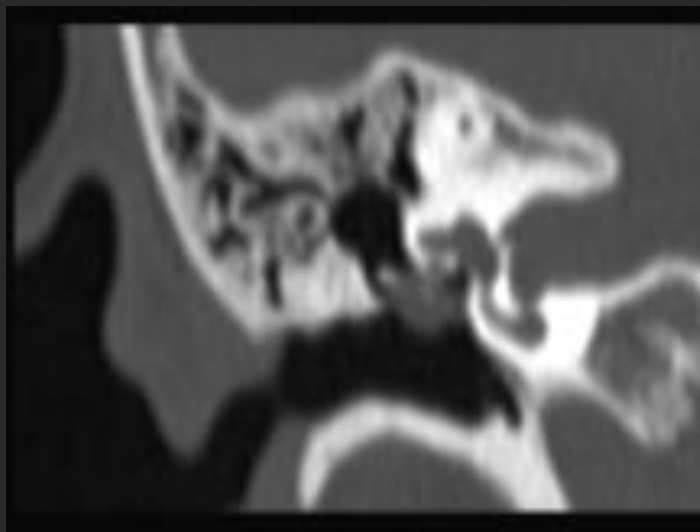
膽脂瘤手術

#529xxxx ♂ 8y5m (2000/09/25)

2008/11/27 cIII+AP(FS), rev. Rt

術前

術後 3年3月

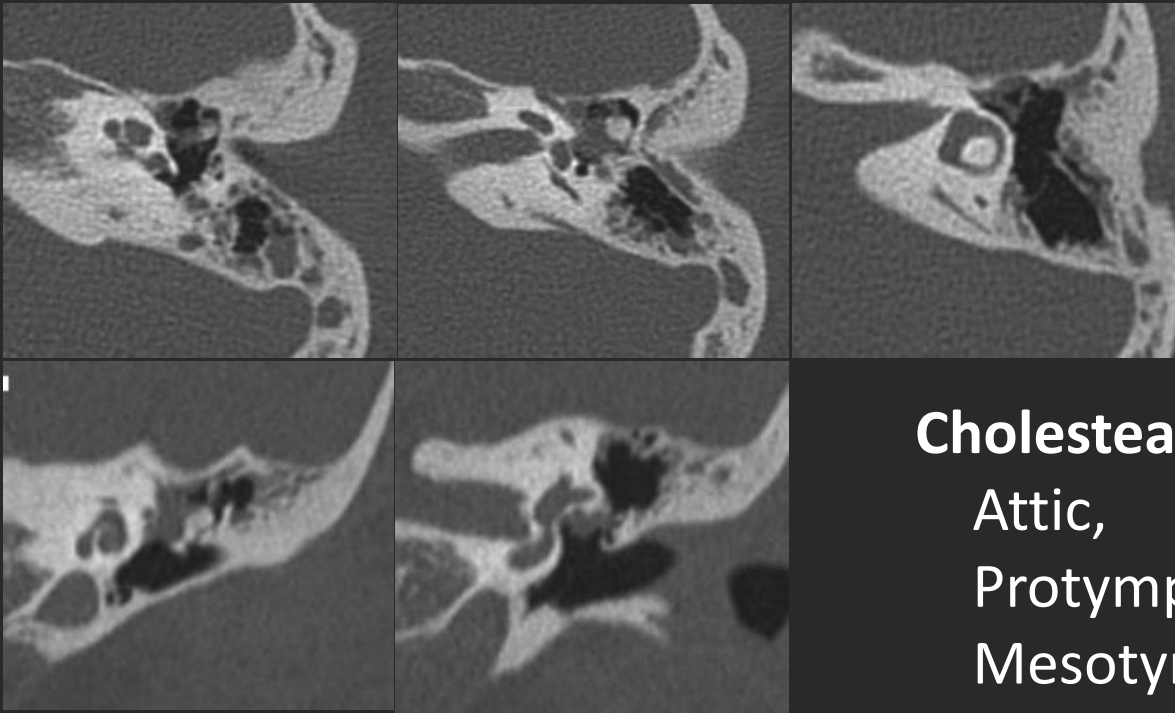


膽脂瘤手術

#592xxxx ♀ 15y7m (1997/08/17)

Congenital Cholesteatoma, Lt

2013/03/11 TORP+Atticoantroplasty(FS),Lt



Cholesteatoma:

Attic,
Protympanum,
Mesotympanum,
Retro-tympanum

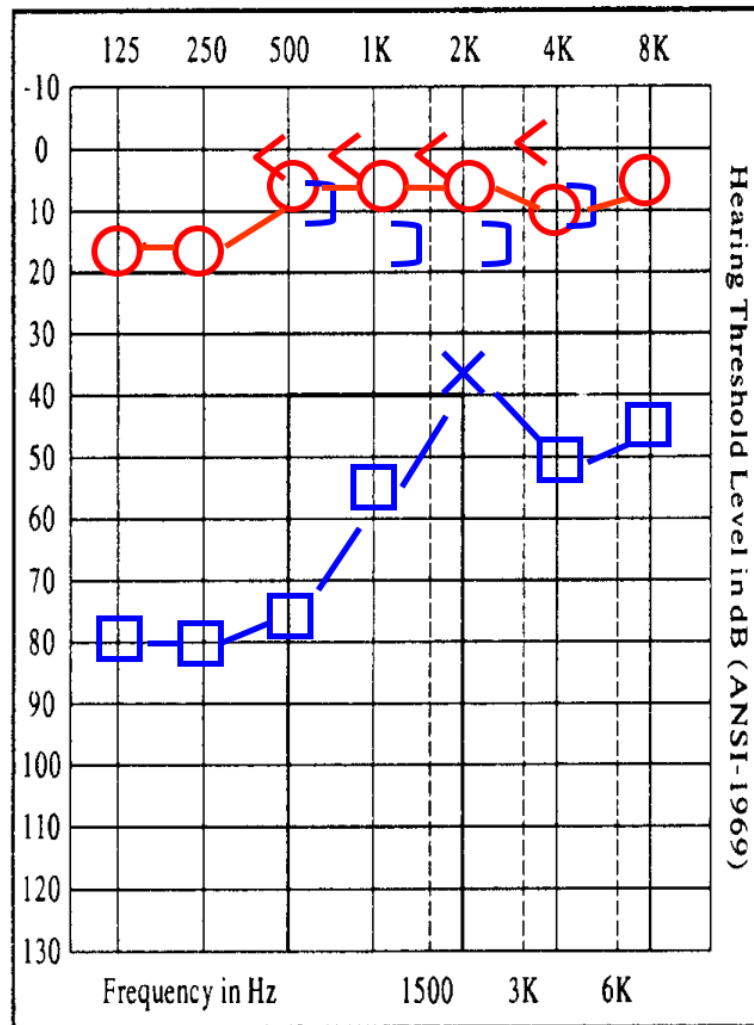


592xxxx 鼓室成形手術式

2012/12/27(preop)

	Rt	Lt
ABG	5 dB	42 dB
AC	5 dB	55 dB
BC	0 dB	13 dB
Tympanogr.	A	As

Pure-Tone Audiogram (機器型號:)

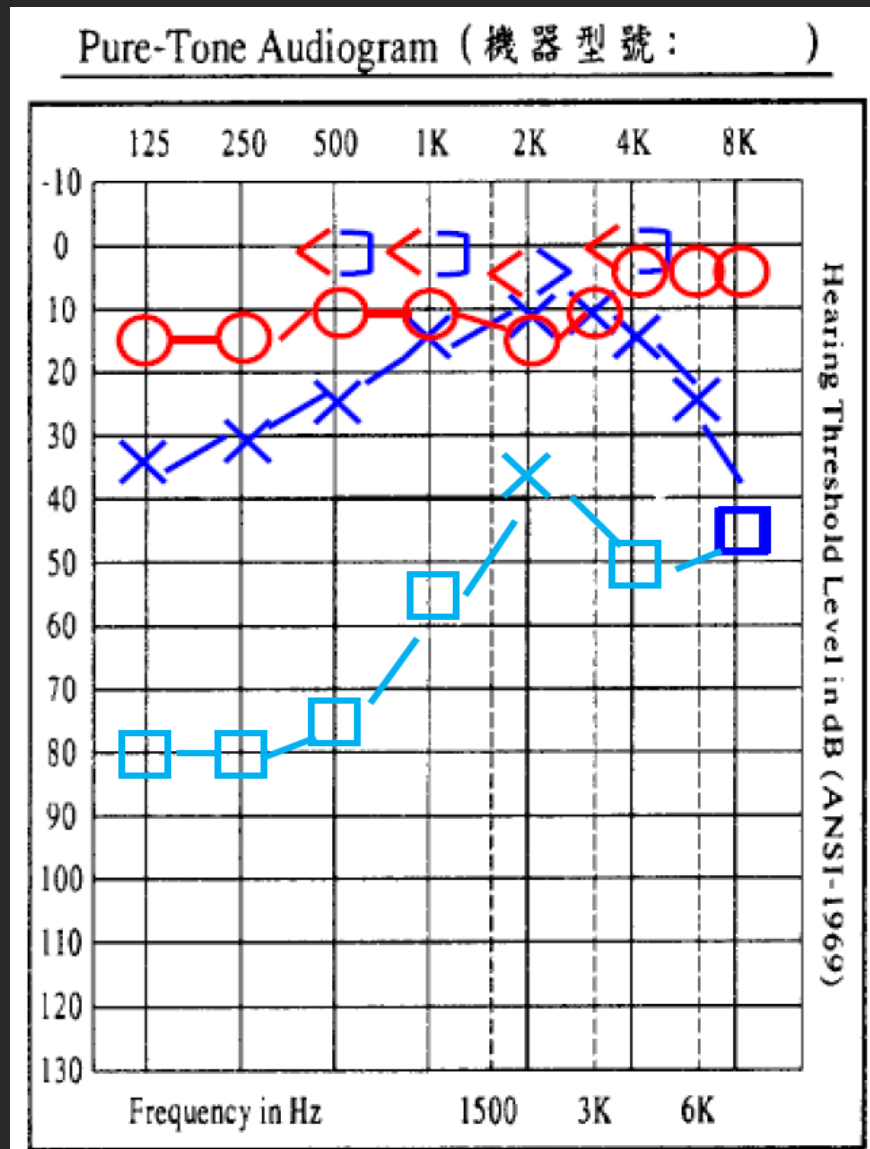


592xxxx 鼓室成形手術式

TORP+AAP(FS), Lt

2013/09/03 (postop 6m)

	Lt (pre-op)	Lt (post-op)
ABG	42 dB	15 dB
AC	55 dB	17 dB
BC	13 dB	2 dB
Tym.	As	A



感謝聆聽



圓山飯店

Taipei Grand Hotel



日月潭

(Sun-Moon Lake, Nantou)