Эндоскопический подход в хирургии гнойных отитов

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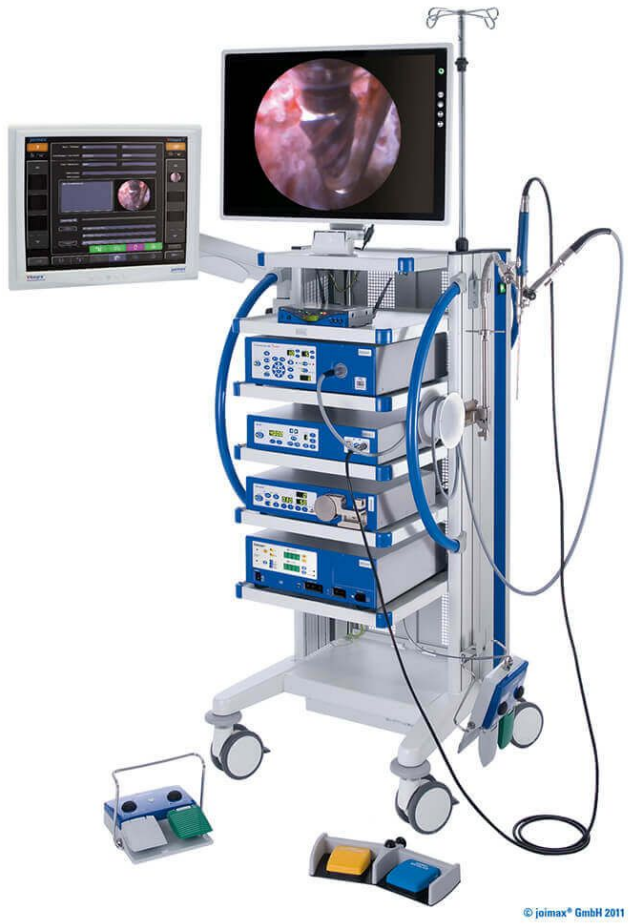


Fig. 3a
View from External Auditory Canal

Fig. 3b
View after removing Tympanic Membrane

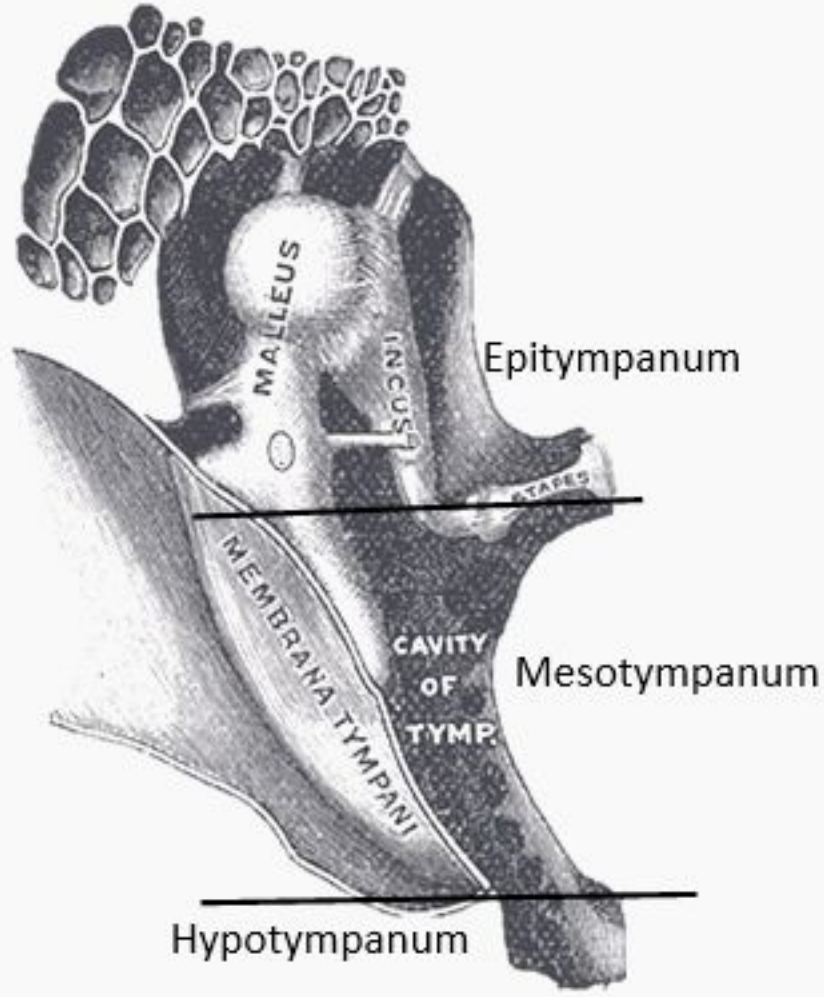


Fig. 4
Compartments

ТЕОРИТИЧЕСКИЕ ПЛЮСЫ И МИНУСЫ

МИКРОСКОП

- ДВЕ РАБОЧИЕ РУКИ
- ОГРАНИЧЕННАЯ ВИДИМОСТЬ

ЭНДОСКОП

- ОДНА РАБОЧАЯ РУКА
- ЯТРОГЕННЫЕ ТРАВМЫ
- ИНДУЦИРОВАННАЯ ГИПЕРТЕРМИЯ
- ГИБКОСТЬ НАСТРОЙКИ ВИЗУАЛИЗАЦИИ

Джентельменский набор

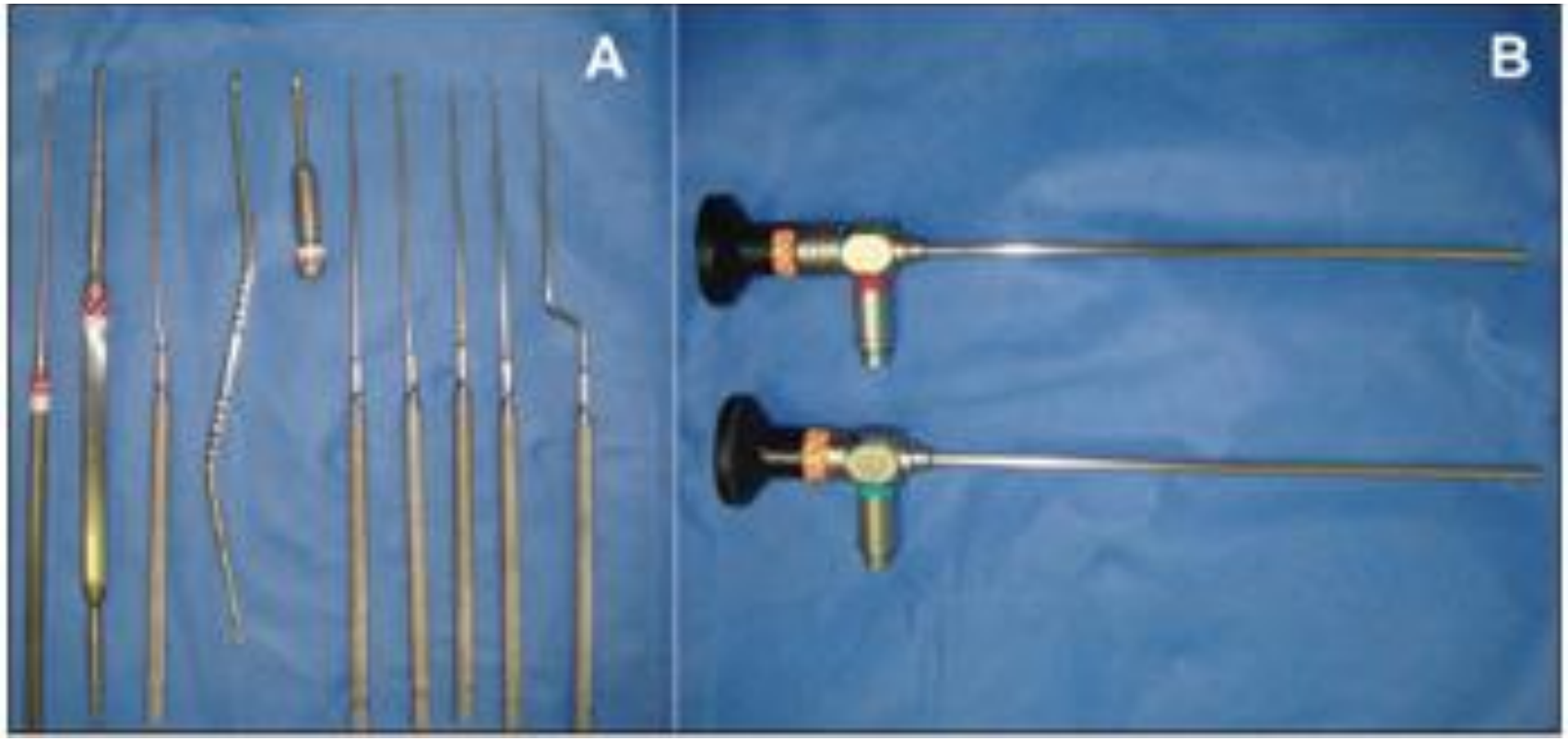


Figure 1. Instruments used. A: Traditional material for otological surgery added to curettes and specially built aspirator for ungluing. B: Endoscopes of 4 mm and 18 cm (0 and 45 degrees of angulation). Besides these, traditional aspirators, tweezers and scissors are also required.

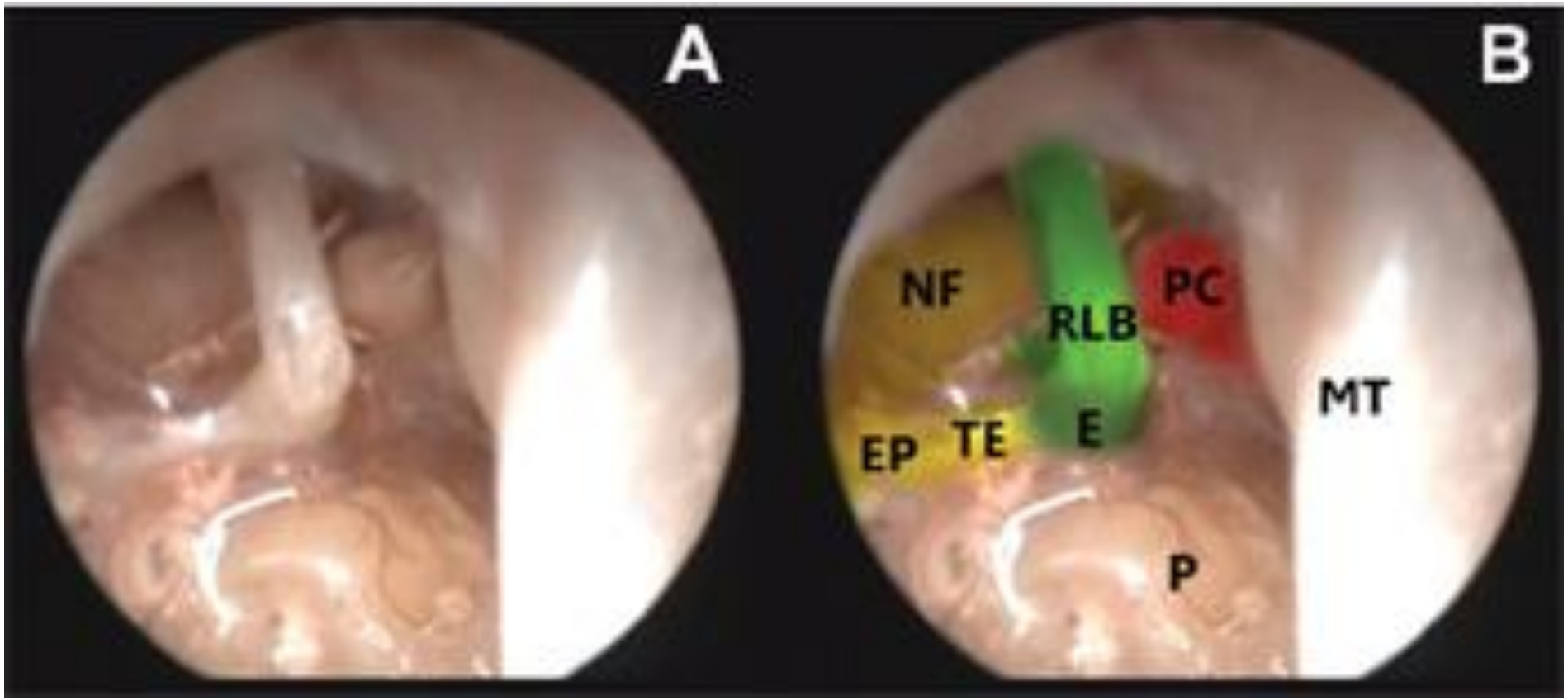


Figure 2. Ear endoscopic dissection. A: Endoscopic view (0 degrees and 4mm) of the middle ear, after curettage of the posterior wall of the external auditory meatus and removal of the chorda tympani nerve. B: The same view edited with colors for a better identification of some structures. MT: tympanic membrane. P: promontory. E: stirrup. TE: stapedius tendon. EP: pyramidal eminence. RLB: incus long branch. NF: facial nerve tympanic segment. PC: Cochleariform process and tympanum tensor.

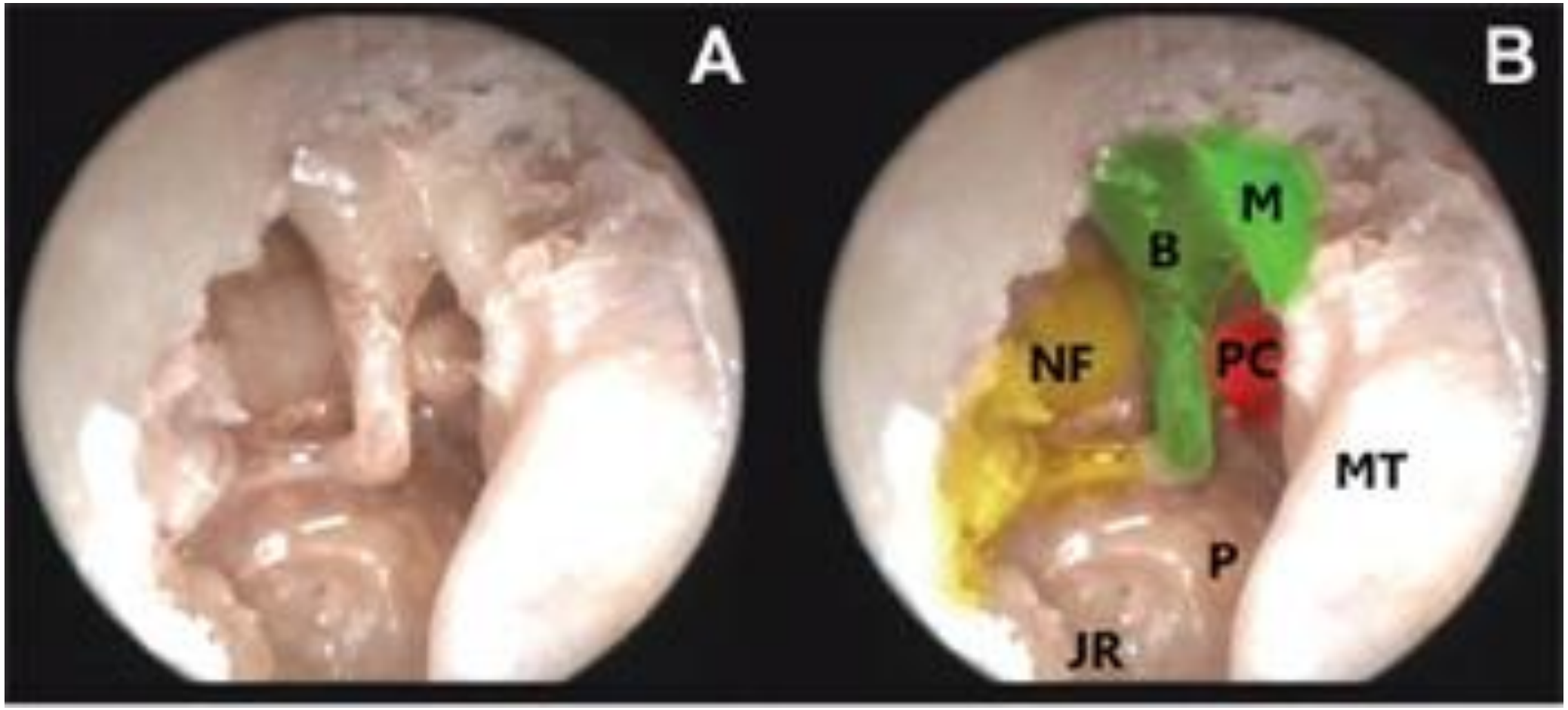


Figure 3. Ear endoscopic dissection. A: Endoscopic view (45 degrees and 4mm) of the middle ear, after curettage of the posterior wall of the external auditory meatus and removal of the chorda tympani nerve and beginning of the attic region curettage. B: The same view edited with colors for a better identification of some structures. MT: tympanic membrane. P: promontory. JR: round window niche. B: incus. M: hammer and beginning of viewing of the incudo-malleolar joint. NF: facial nerve tympanic segment. PC: Cochleariform process and tympanum tensor.

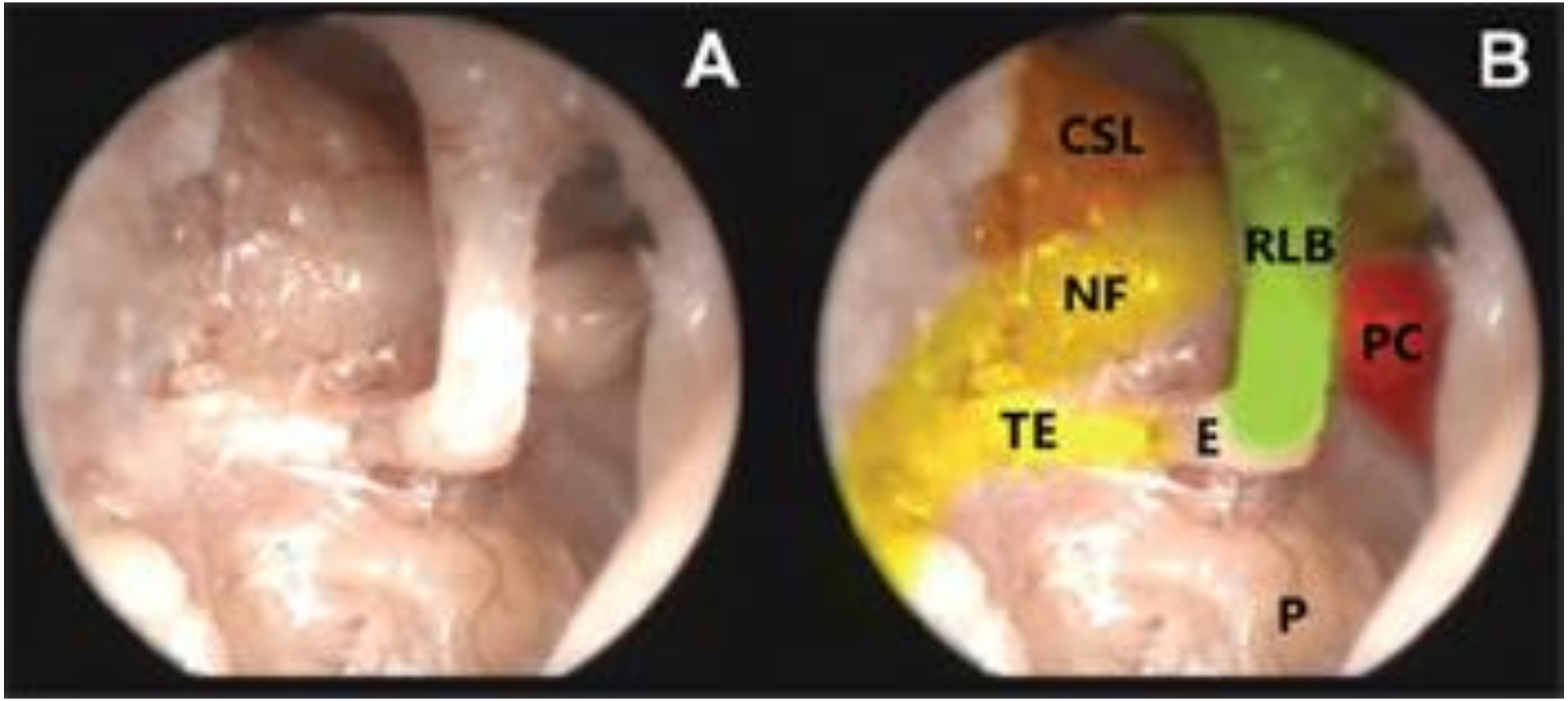


Figure 4. Ear endoscopic dissection. A: Endoscopic view (45 degrees and 4mm) of the middle ear. B: The same view edited with colors for a better identification of some structures. PC: Cochleariform process and tympanum tensor. P: promontory. E: stirrup. TE: stapedius tendon. RLB: incus long branch. NF: facial nerve tympanic segment. CSL: lateral semi-circular canal and entry to the mastoid antrum.

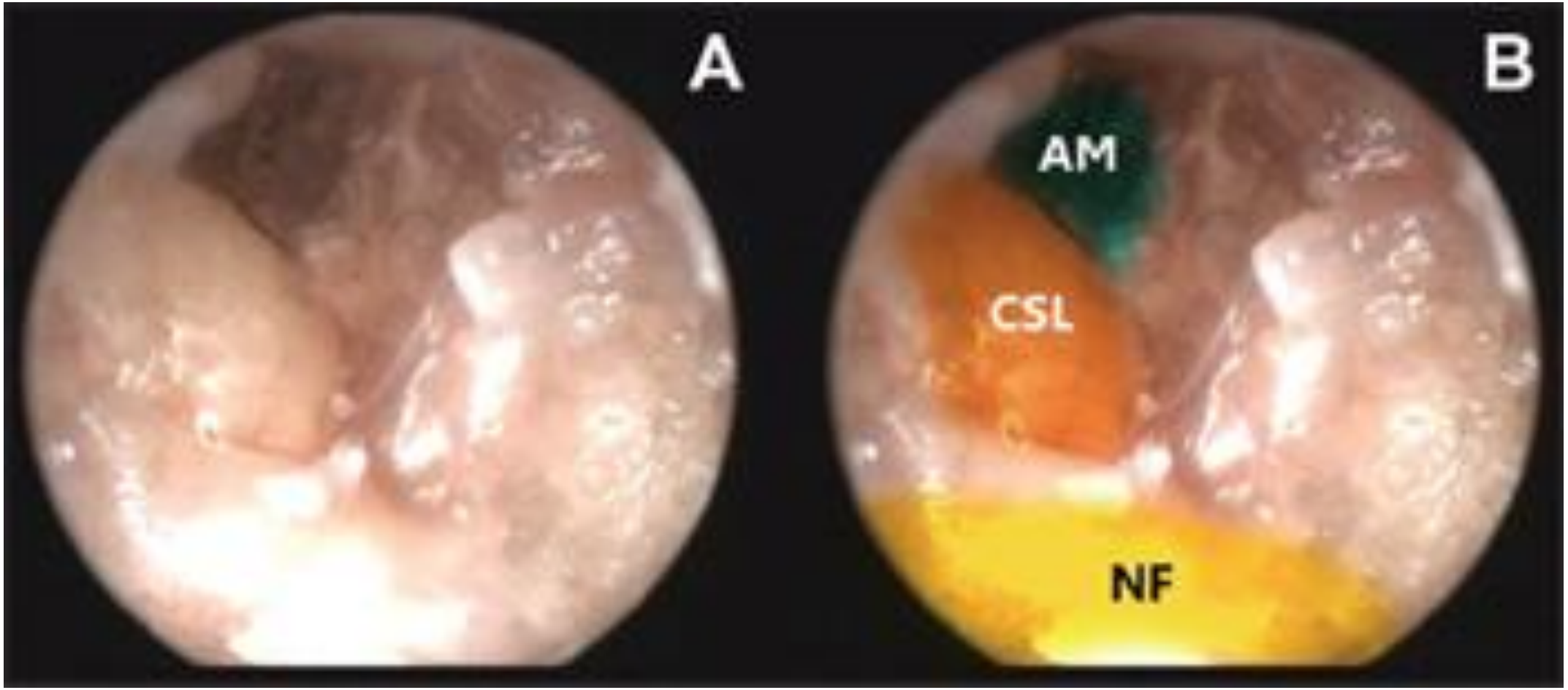


Figure 5. Ear endoscopic dissection. A: Endoscopic view (45 degrees and 4mm) of the middle ear after removal of the tympanic membrane and ossicular chain. B: The same view edited with colors for a better identification of some structures. NF: facial nerve tympanic segment. CSL: lateral semi-circular canal. AM: entry to the mastoid antrum.

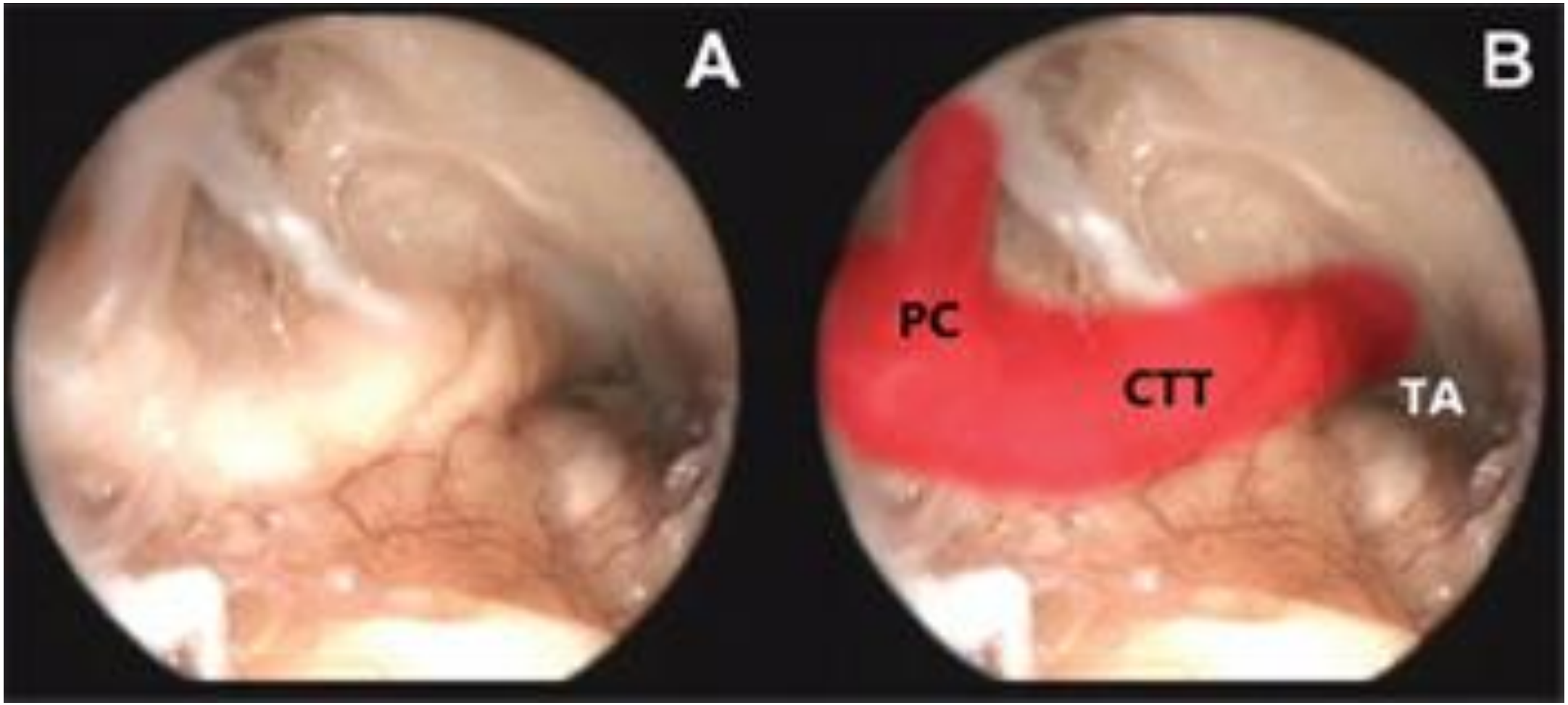
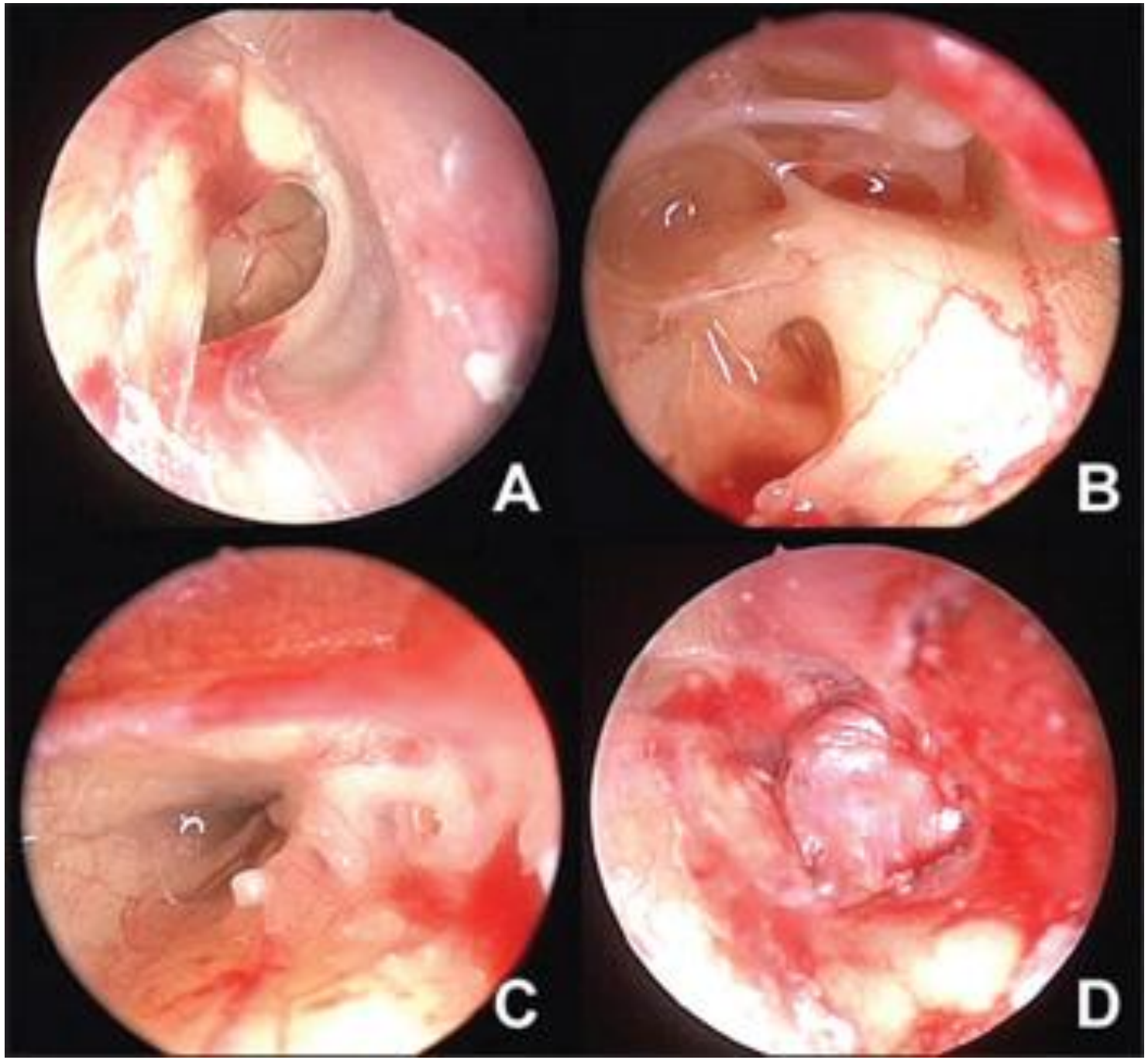


Figure 6. Ear endoscopic dissection. A: Endoscopic view (45 degrees and 4mm) of the middle ear after removal of the tympanic membrane and ossicular chain. B: The same view edited with colors for a better identification of some structures. TA: Eustachian tube region. CTT: tympanum tensor muscle canal. PC: cochleariform process and tympanum tensor muscle tendon.


A
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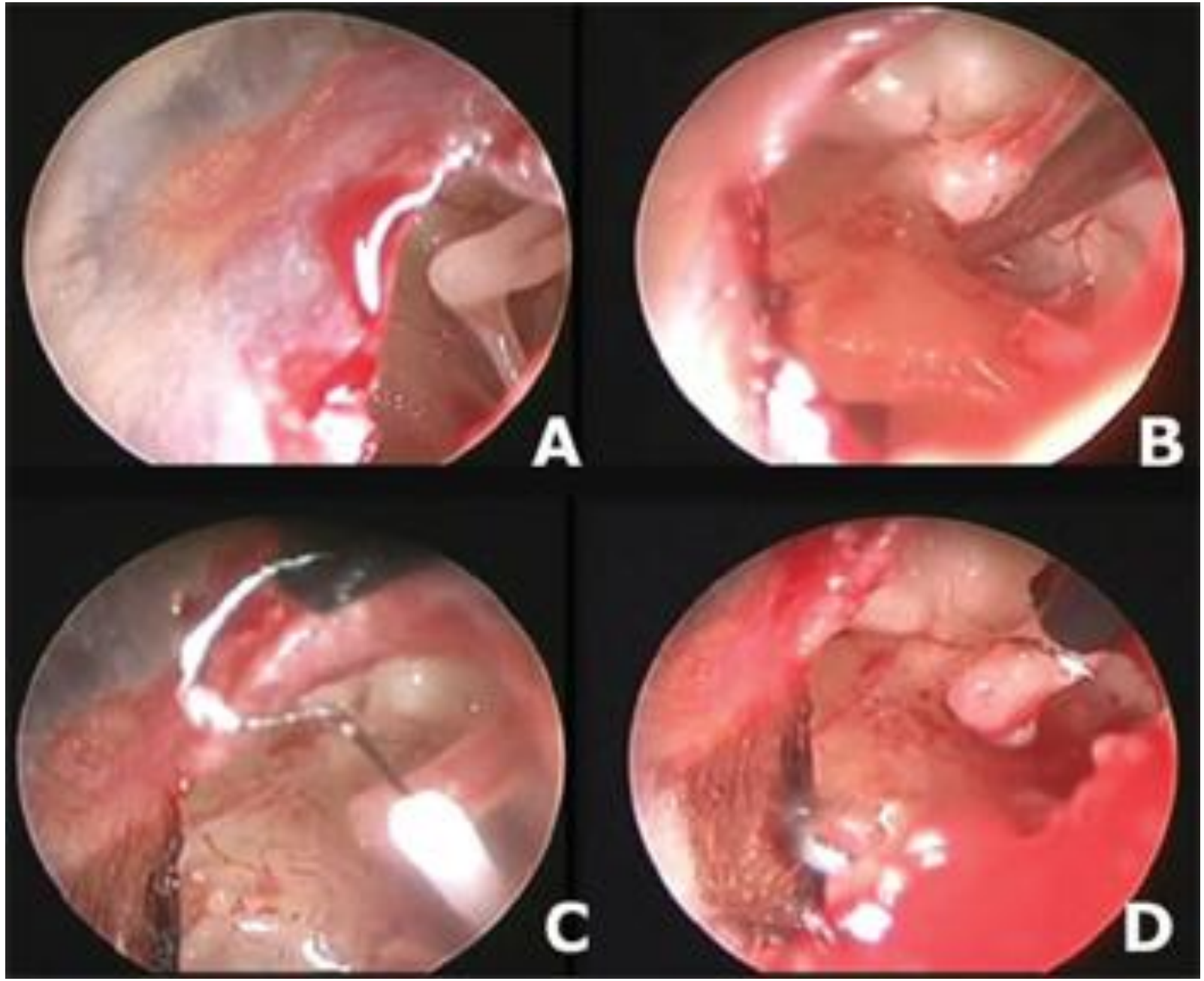
A
B
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D

ИССЛЕДОВАНИЕ

Объекты исследования

- 58 пациентов
- Средний возраст 37 лет (15-63)
- 35 женщин, 23 мужчины
- Common complaints : Hearing loss, purulent discharge, dizziness
- Sensorineural hearing loss: 14.0 (+-5.8 dB)
- Conductive hearing loss: 31.9 (+-9.3 dB)
- + Rinne test in 16 patients
- + Weber test in 53 patients

Манипуляции

1) Общая анестезия, заушный разрез
2) Lifted flap
3) !Examination!
4) Операция
5) !Examination!
6) =-=-=-=-

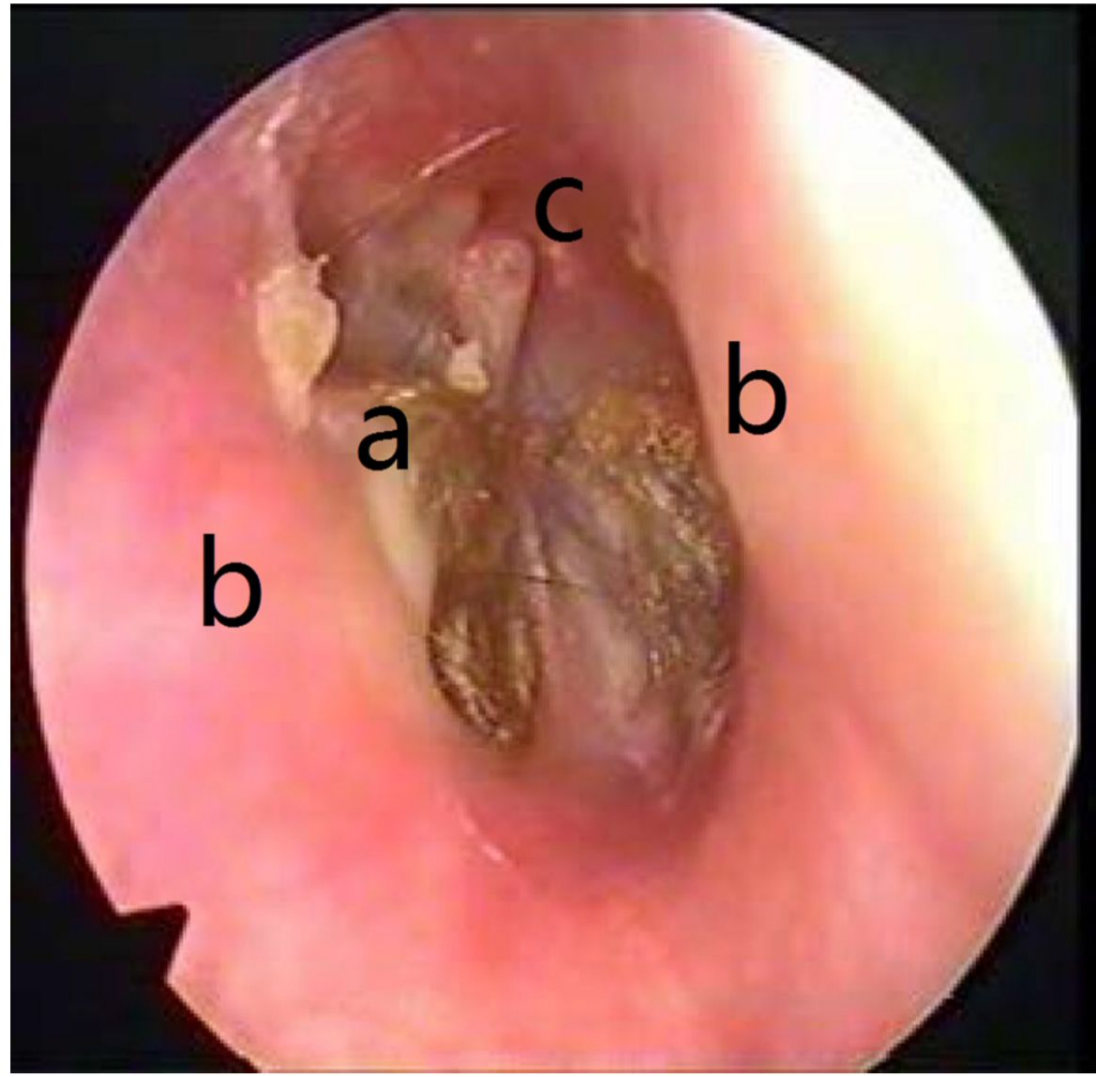

Fig 1. Preoperative transcanal microscopic view: (a) Cholesteatoma debris; (b) External auditory; canal bulging (obscures some part of the visual field); (c) Malleus.

doi:10.1371/journal.pone.0132890.g001

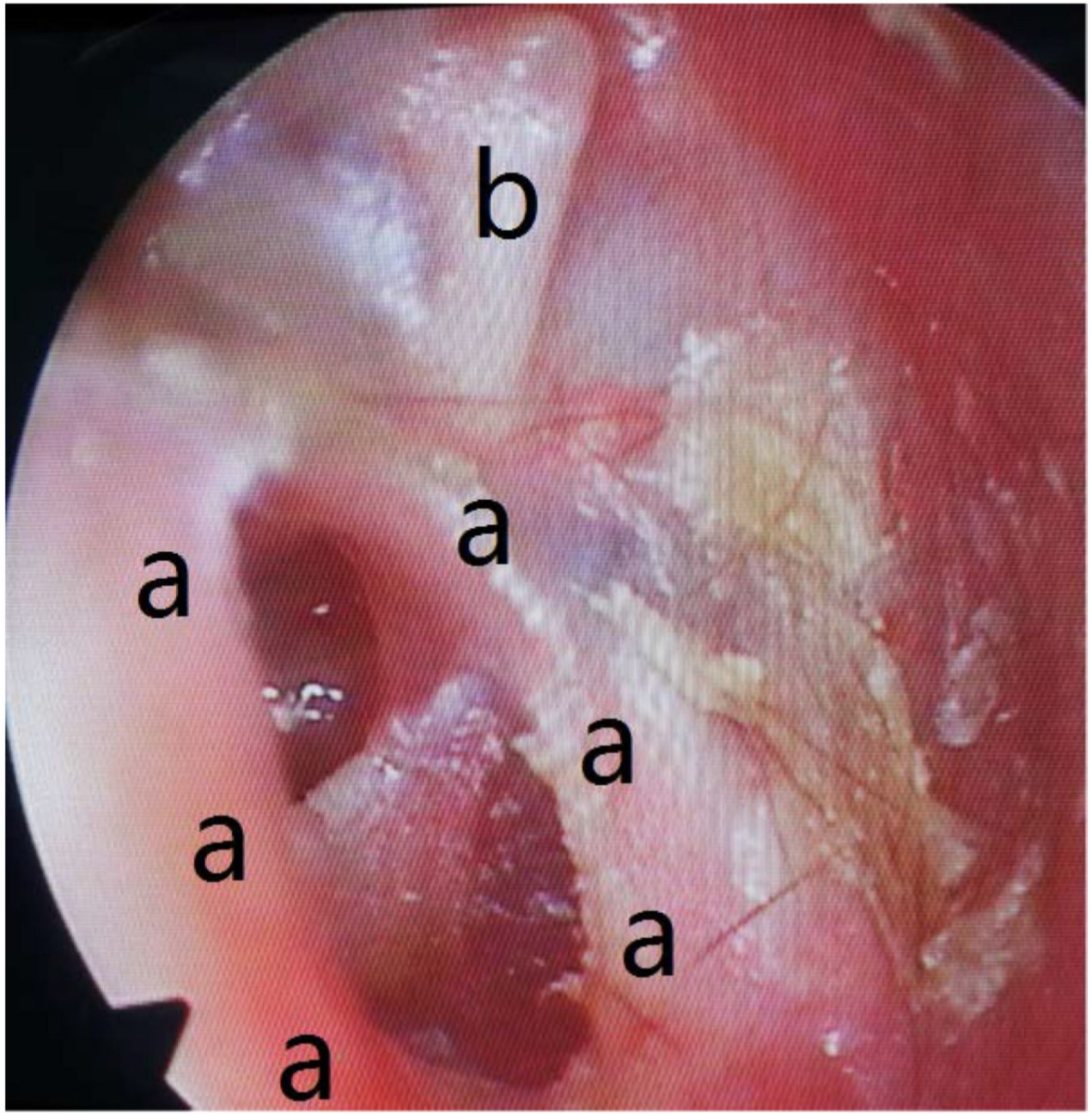

Fig 2. Preoperative transcanal endoscopic view: (a) Malleus; (b) Tympanic membrane perforation (evident after the cholesteatoma removal).

doi:10.1371/journal.pone.0132890.g002

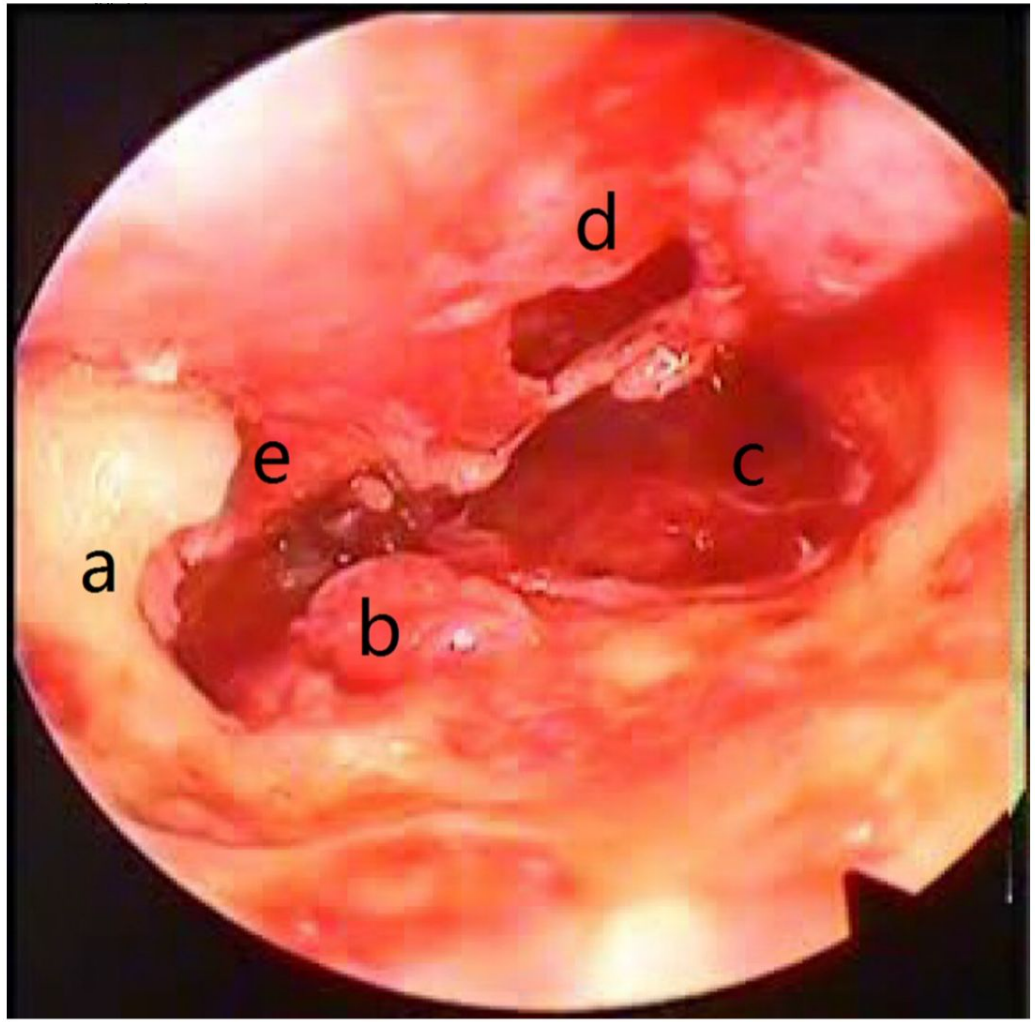

Fig 3. Preoperative middle ear microscopic view: (a) Scutum erosion; (b) Cholesteatoma and granulation tissue (around the stapes and facial recess); (d) Hypotympanum; (e) Tympanic membrane perforation; (f) Malleus.

doi:10.1371/journal.pone.0132890.g003

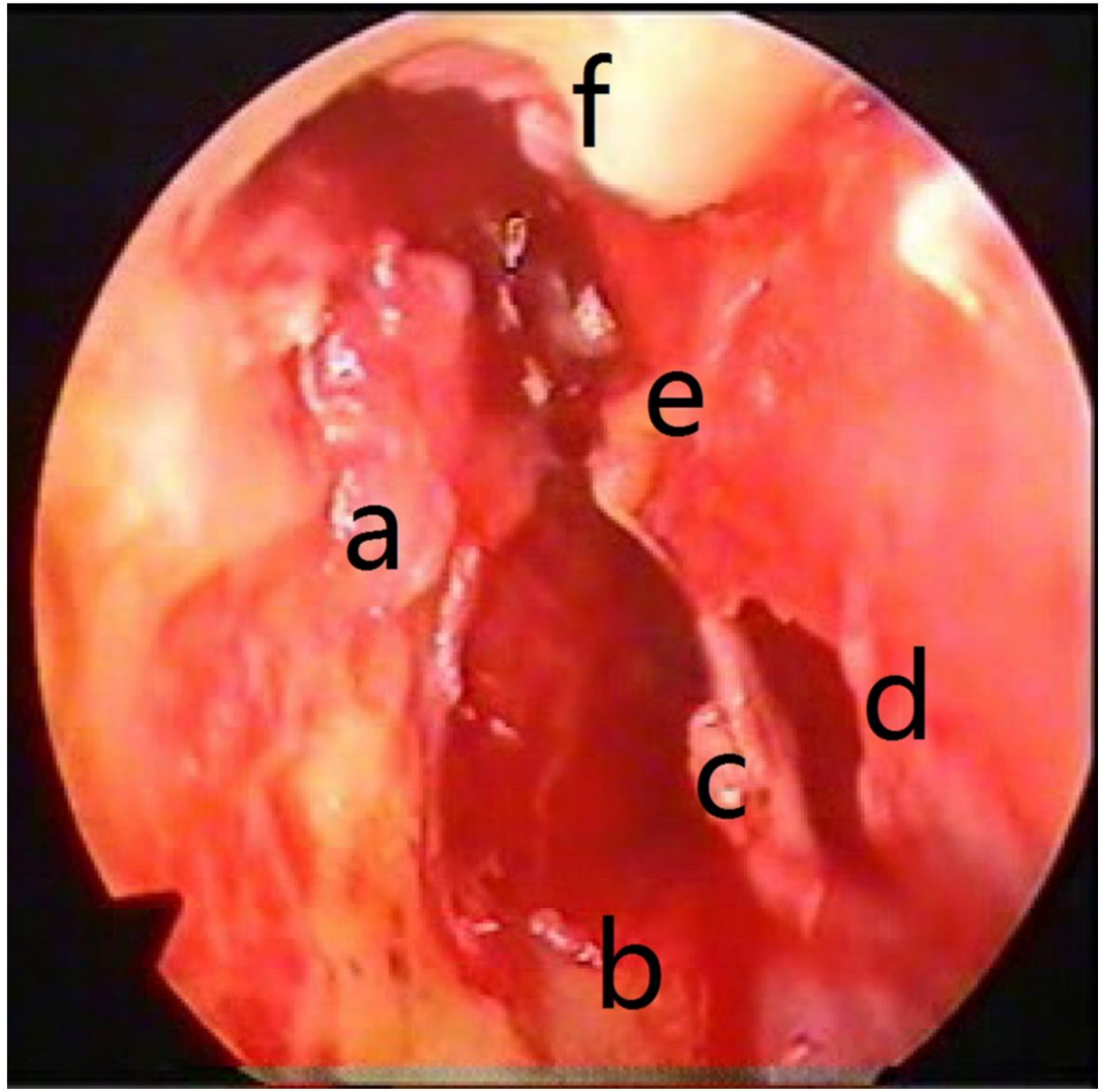

Fig 4. Preoperative middle ear endoscopic view: (a) Cholesteatoma and granulation tissue (around the stapes and facial recess); (b) Eustachian tube opening; (c) Hypotympanum; (d) Tympanic membrane perforation; (e) Malleus; (f) Scutum erosion.

doi:10.1371/journal.pone.0132890.g004

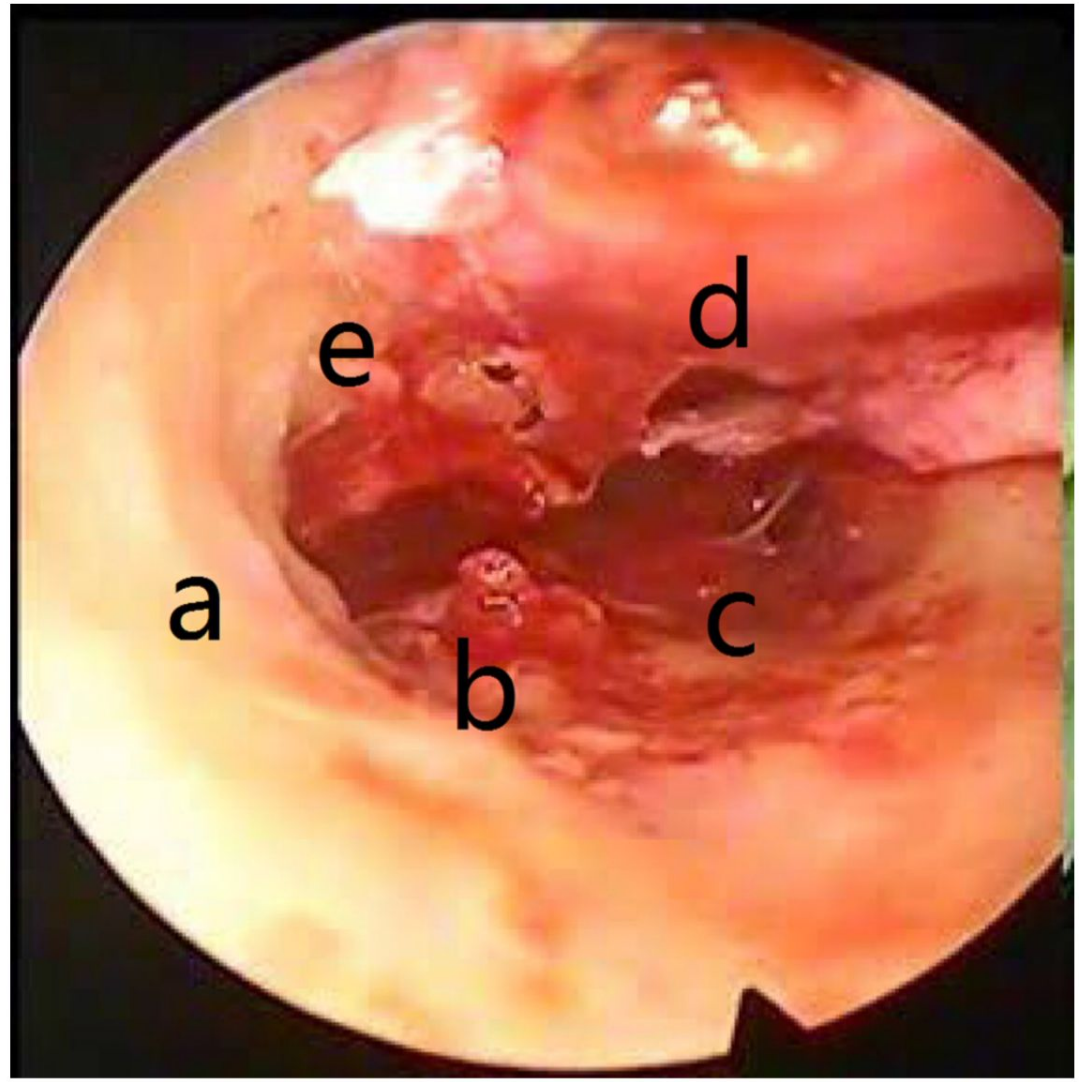

Fig 5. Postoperative middle ear microscopic view after the atticotomy and cholestetoma removal. (a) Scutum after the atticotomy; (b) Stapes capitalum; (c) Hypotympanic air cells; (d) Tympanic; (e) Membrane perforations.

doi:10.1371/journal.pone.0132890.g005

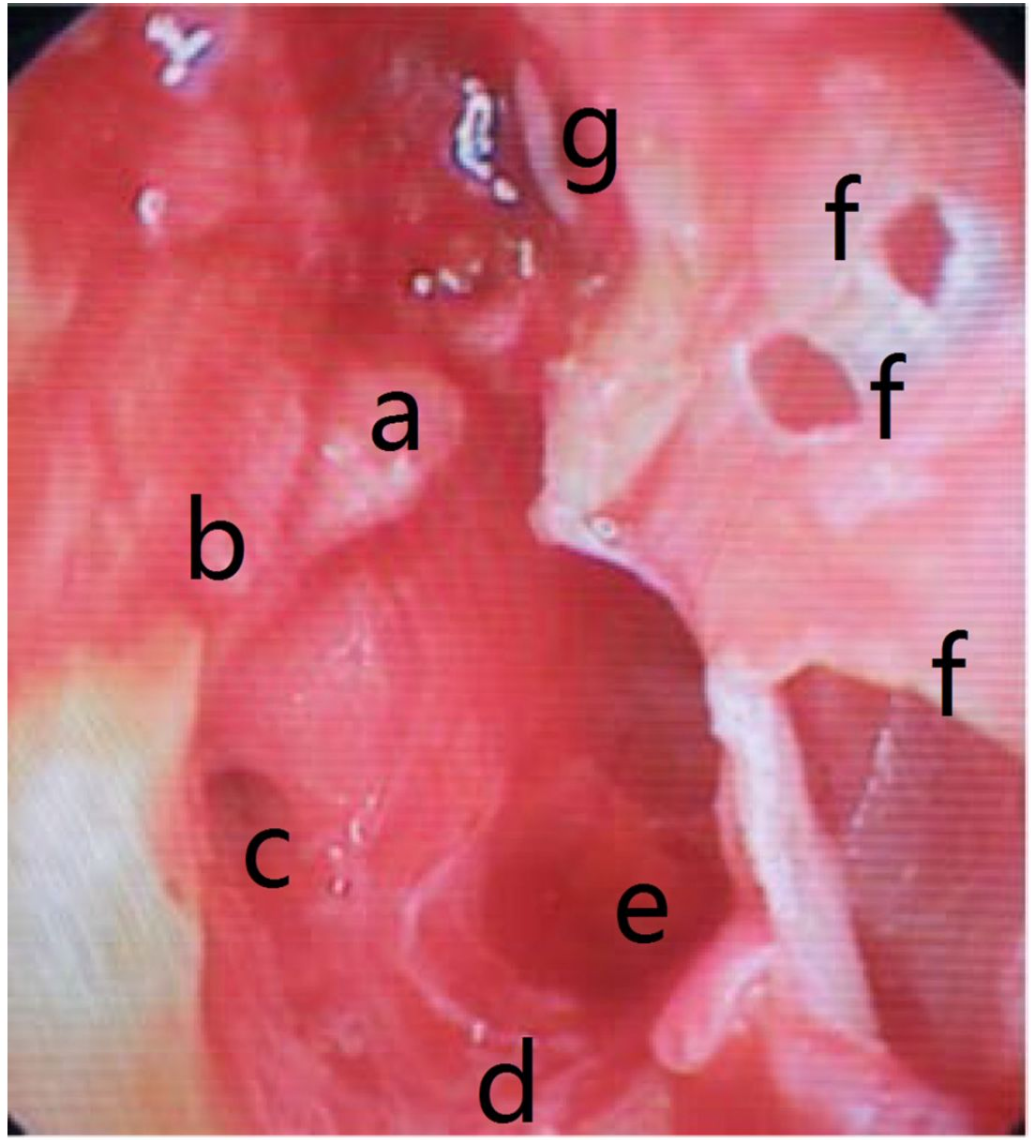

Fig 6. Postoperative middle ear endoscopic view (evidence of a minimal remaining cholesteatoma in the tympanic sinus). (a) Stapes capitalum; (b) The remaining cholesteatoma in the tympanic sinus; (c) Round window; niche; (d) Hypotympanic air cells; (e) Eustachian tube opening; (f) Tympanic membrane perforations; (g) Malleus.

doi:10.1371/journal.pone.0132890.g006

Table 1. The characteristics of the anatomical parts of the middle ear based on microscopic and endoscopic findings.

Structure	Microscope, n (%)	Endoscope, n (%)	*P* value [a]
Epitympanum	18 (31.0)	31 (53.5)	0.015
Mesotympanum			
Malleus	47 (81.0)	47 (81.0)	1.000
Incus	39 (67.2)	40 (69.0)	0.842
Stapes	38 (65.5)	47 (81.0)	0.059
Oval window	33 (56.9)	46 (79.3)	0.010
Round window	39 (67.2)	52 (89.7)	0.003
Promontory	58 (100.0)	58 (100.0)	1.000
Eustachian tube	30 (51.7)	53 (91.4)	0.001
Facial nerve	3 (5.2)	3 (5.2)	1.000
Posterior mesotympanum			
Tympanic sinus	3 (5.2)	23 (39.7)	0.001
Hypotympanum	14 (24.1)	32 (55.1)	0.001

[a] The P value of the Bonferroni correction for eight multiple testings = 0.006

Structure	Microscope		Endoscope		*P* value
	Good, n (%)	Reduced, n (%)	Good, n (%)	Reduced, n (%)	
Malleus mobility	42 (89.4)	5 (10.6)	42 (89.4)	5 (10.6)	1.000
Incus mobility	32 (82.0)	7 (18.0)	33 (82.5)	7 (17.5)	0.958
Stapes mobility	32 (82.2)	6 (17.8)	40 (85.1)	7 (14.9)	0.909
Round window reflex	31 (79.5)	8 (20.5)	41 (78.8)	9 (20.2)	0.765

doi:10.1371/journal.pone.0132890.t002

Table 3. Ossicular chain erosion in the microscopic and endoscopic views.

Structure	Microscope		Endoscope		*P* value
	Healthy bone, n (%)	Erosive bone, n (%)	Healthy bone, n (%)	Erosive bone, n (%)	
Malleus erosion	47 (81.0)	11 (19.0)	47 (81.0)	11 (19.0)	1.000
Incus erosion	31 (51.4)	26 (44.8)	32 (55.1)	26 (44.8)	0.976
Stapes erosion	37 (63.8)	14 (24.1)	44 (75.9)	14 (24.1)	0.705

doi:10.1371/journal.pone.0132890.t003

А вот если бы…

- 4 из 13 холестеатом остались незамеченными
- Остатки грануляционной ткани у 5
- Гипертрофированная слизистая у 23
- Тимпаносклеротические бляшки у 12

ВЫВОД

Один метод хорошо, но два лучше