Endoscopic Transcanal Management of Cholesteatoma

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The Endoscope in Otology

- Mostly for documentation.
- Mostly diagnostic.
- Exploration of old mastoid cavities

Endoscopic Management of Cholesteatoma

What do we know about cholesteatoma?

- Most cholesteatomas are manifestation of retraction pockets.
- Primarily: middle ear and tympanic cavity disease.
- The attic is the area most commonly involved.
- Most recurrences occur within the tympanic cavity and its extensions, not the mastoid.

Why the Mastoid

"Why not the canal"

- You can get there easily.
- You are using it as a conduit to other area.
- You can not use the ear canal because of the limitation of the microscope.
Narrowest segment of the ear canal

Limited microscopic field of view

Wide endoscopic field of view

Microscopic Transcanal Surgery
Wide postauricular access

Limited transcanal microscopic access

Wide Field of View:
Endoscopic Ear Surgery:

- Thomassin JM, Korchia D, Doris JMD. Endoscopic guided otosurgery in the prevention of residual cholesteatoma. Laryngoscope. 1993;103:939-943
Instrumentation:

- 0 degrees, 4 mm sinus endoscope.
- Video camera and monitor.
- Modified ear instruments.
Radiographic Work up

- CT of the temporal bone.
- “Trans-canal cuts”
Three Approaches:

- Limited Attic Cholesteatoma.
- Endoscopic Wide Canal Access.
Surgical Intervention:

- Endoscopic transcanal surgery.
- Elevation of wide tympanomeatal flap.
- Cholesteatoma sac pursued under direct vision after necessary removal of bone and ossicles.
- Reconstruction of ossicles and attic defect.

Endoscopic Management of Limited Cholesteatoma

- 34 year old with occasional drainage from right ear and granulation tissue.
- 28 year old with right ear retraction and mild conductive hearing loss.
- 38 year old with left ear cholesteatoma and granulation tissue.
Methods:

- Retrospective study.
- Selection criteria:
  - Intra-operative finding of limited attic cholesteatoma: accessible and removable attic disease.
  - Never had surgery on the involved ear.
  - No major mucosal disease.

Patients:

- 73 ears and procedures in 69 patients.
- 9 patients younger than 12 years old.
- 51: air bone gap of 20 dB or more (average of 500, 1000, 2000 Hz).
- CT were done in 46 ears:
  - 26: Bone erosion.
  - 11: Partial opacification of mastoid and tympanic cavity.
  - 7: Total opacification.
Results:

- No iatrogenic facial nerve injuries.
- Stable bone thresholds (No change of 10 dB or more of average 500, 1000, 2000, and 3000 Hz).
- Disease was dissected of ossicles with preservation in 24 ears.
- Primary reconstruction in 38 ears.

Results:

- Mean follow-up 43 months.
- 5 ears had clinically evident failure with recurrent cholesteatoma.
- 8 had revision for ossicular reconstruction and/or perforation failure with one case showing a cholesteatoma pearl.
- 47 ears had air bone gap < 20 dB.
  - 22/38 were primarily reconstructed.
Results

28 ears: Moderate to severe retraction in other areas of the TM were evident.
- Observation was recommended.
- No further intervention needed.

Conclusions:
- Endoscopic technique allows transcanal, minimally invasive, management of attic cholesteatoma with good results.
- Endoscopic technique increases the potential for preservation of ossicles.
- Continuous vigilance is needed to address any further retraction.
Endoscopic “Open Cavity” Management of Cholesteatoma

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Canal Wall Down Procedures:
- Definitive treatment.
- Large problematic cavities, obliteration?
- Poor framework for ossicular reconstruction.
- Scarring, closing down of meatus.
- Unpredictable healing, unpredictable cavities.
Endoscopic Open Cavity:

- Definitive treatment.
- Small, self cleaning, and manageable cavities.
- Minimal surgical trauma to the cartilaginous ear canal leading to minimal scarring and predictable cavities.
- Provides a better framework for ossicular reconstruction.

Methods & Patients:

- Retrospective study.
- Significant disease: Endoscopically accessible attic and antrum disease.
- 8 had previous surgery on the involved ear.
- 51 ears out of a total of 127 ears with cholesteatoma managed with endoscope.
Operative Intervention:

- Endoscopic transcanal surgery.
- Outpatient surgery 49/51.
- Elevation of wide tympanomeatal flap.
- Cholesteatoma sac pursued under direct vision after necessary removal of bone.
- Attic widened, emptied of the body of incus and the head of malleus and packed open.
- Reconstruction of ossicles and partial reconstruction of TM.
Video Demonstration

Results:

- No iatrogenic facial nerve injuries.
- Stable bone thresholds except in one patient with perilymphatic fistula.
- Ossicular chain reconstruction performed primarily in 42 ears.
Results

- Mean follow-up 42 months.
- 2/51 revised for recurrent disease.
- 23/42 (55%) closure of air bone-gap to within 20db (avg. Of 500, 1000, 2000 Hz).
- 9 required office based minor procedures, mostly early on in the experience.

Conclusions:

- Endoscopic technique allows transcanal, minimally invasive, management of attic cholesteatoma with good results.
- Endoscopic technique provides a better framework for ossicular reconstruction.
- Endoscopic technique allows Small, predictable, and manageable cavities.
Wide Endoscopic Transcanal Acess

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A Limiting Canal

- A small canal.
- An anterior overhang.
- Prominent spine of Henle.
- Unusual angle.
Positioning Issues

- You can angle the endoscope a lot easier and in a more extreme way than the microscope.

**BUT**

- The shoulder is a much bigger problem in endoscopic surgery especially for attic disease.
What to do?

- You need to have a plan.
- Where is the disease?
- How narrow and limiting the canal in relation to the disease.

Decision:
- Wide transcanal access.
- Wide tympanomeatal flap and appropriate curetting.

Wide Transcanal Access

- A Limiting ear canal.
- Extensive involvement of the tympanic cavity especially anteriorly and inferiorly.
- Access to the Petrous Apex
Wide Transcanal Endoscopic Access

- Remove skin the ear anal skin along with the epithelial layer of TM remnant.
- Excision and Removal as needed of the fibrous TM remnant.
- Curetting of bone as needed to gain full access to the tympanic cavity and its extensions.
- Reconstruction.
- Video presentation.

Enlarging the Ear Canal

Dura

Facial Nerve Anterior Sigmoid

Ear Canal

TMJ

High Jugular
Few Words of Wisdom

- Relax, you have all the time you need.
- Irrigation, irrigation and more irrigation.
- Do not get discouraged the first 10 minutes as you raise the flap, this is the most difficult time for bleeding.
- Pack the areas the you are not working on.

Wide Transcanal Access

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A Stepwise Approach:

CT and Clinical evaluation:

- A Limiting ear canal.
- Extensive involvement of the tympanic cavity especially anteriorly and inferiorly.
- Involvement of the mastoid cavity proper.
- Previous failed surgery, mucosal disease or a really wet ear.

Start with: Primary Transcanal Approach.
If needed: Traditional Mastoidectomy.
Endoscopic Technique

- It's not about reinventing wheels.
- Remember the Ear Canal...
- Distinct advantages within the tympanic cavity, anterior attic, facial recess, hypotympanum, ET, and sinus tympani
- Do not let them convince you that you cannot remove the disease while holding the endoscope in hand.

Transcanal vs. Postauricular Approach.

- Minimally invasive.
- Less cutting, less tissue trauma, less bleeding, and more refined surgery.
- Outpatient surgery.
- Local anesthesia.
Learning Curve Issues

- Start slowly, you will not be able to do it all on the first case.
- FESS experience is very valuable.
- May want to do a few simple tympanoplasties using the endoscope.
- Start with the endoscope, Do not end with it.

Planning the Surgery

- Use the information from the CT effectively. Make sure its recent.
- Evaluate the Ear Canal.
- Evaluate the status of the TM and how useful in reconstruction.
- Make your choice:
  - Tympanomeatal Flap.
  - De-epithelialization of the Canal and TM
Start where the cholesteatoma starts

- Use transcanal endoscopic approach for tympanic cavity and extensions.

THEN

- Postauricular microscopic technique to address disease within the mastoid cavity proper.

Equipment Issues:

- You need a good camera, you will not see well otherwise.
- You will be OK with routine ear equipment.
- Fogging can happen if the scope is cold.
Few Words of Wisdom

- Relax, you have all the time you need.
- Irrigation, irrigation and more irrigation.
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- Pack the areas the you are not working on.

International Working Group on Endoscopic Ear Surgery

- First meeting held in 2008 in Antalia, Turkey.
- Next: 24-25 September 2009: Modena, Italy.
- Contact: Daniele Marchioni MD
  marchionidaniele@yahoo.it
The 3rd Annual Hands-on Endoscopic Ear Surgery Workshop
18 February 2009

- Only 18 registrations.
- Fresh frozen complete cadaver heads.
- For Information Tarabichi@yahoo.com

Access to Cochlear Implants in the Third World

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Deafness: The Most Devastating of Disabilities

- Deafness is the most ominous predictor of poor socioeconomic status.
- Colors all aspects of life.

In The Third World:
- Most of the deaf live in the third world.
- Lack of social and educational outlets.
- “Family Centered” life.

The Changing and Developing Third World:
- Today’s third world is not about villagers in a forest in Africa.
- Tech savvy populations of India, China, and the rest of Asia.
- Getting richer, but not fast enough.
- Every five years, we lose a whole generation to eternal silence.
The CI Industry

- Good, ethical business practices, reasonable competition, lots of research.
- "Reasonable pricing".
- Business plan designed around the needs of the health care financing scheme of the developed world.
- Third World Business Plan: Whoever else can afford it in the third world.

Health Care Delivery in the Third World

- No real health care delivery system.
- Pay as you go for most.
- Cost of health care reflect the general low wage economic structure of most of the third world.
- Cost of CI in the third world mostly reflect the pricing structure of the developed world.
What Can We Do?

The CI Industry needs a to develop a distinct business plan for the third world.

Why should they do that:
- Because they are good people.
- Because their customers care about this issue.
- Because their host societies care about this issue.
- Because they are forced to do it.

Raise Awareness:

- Within the CI industry.
- Their customers.
- The Professional Base.
- Society at Large.
- International Organizations
www.CIforALL.com

- The communication hub.
- Forming a virtual community.
- Discovering and analyzing ideas.
- Executing ideas.
- Analyzing results.