Management of Labyrinthine Fistula

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Definition

- A labyrinthine fistula is an abnormal opening in the bony capsule of the inner ear which make a third membranous window of labyrinth to ME or Mastoid

Introduction

- most common complication of COM and is reported to occur in 4-13%
- >50% have a history of COM for 20 years or longer
- Lateral semicircular canal is the most affected site (80% isolated)
- Multiple Fistula: lateral canal plus one or more other sites (Cochlea, vestibule, other semicircular canals)
- Can be caused not only by cholesteatoma, but also by active mucosal COM without cholesteatoma

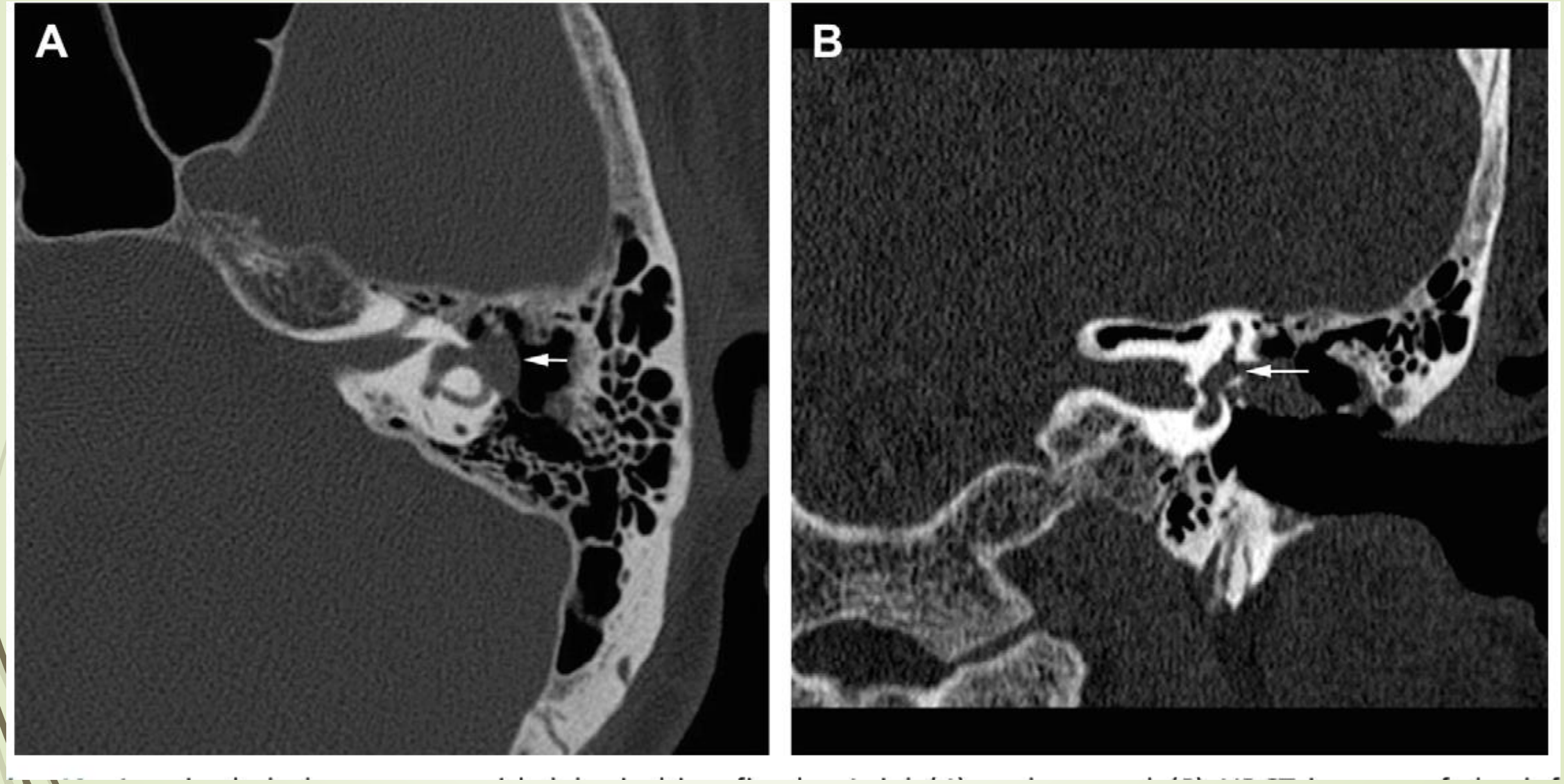
Diagnosis

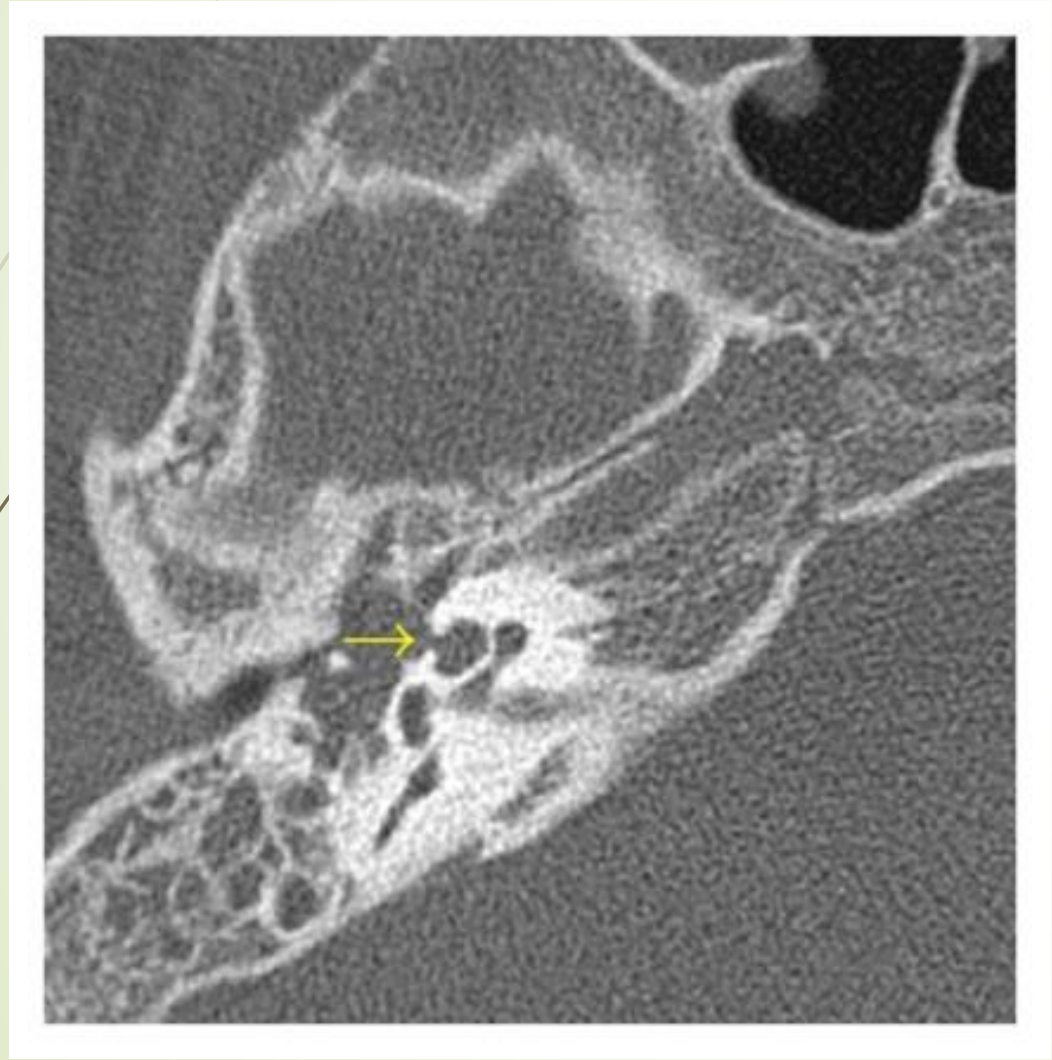
- Labyrinthine fistula is a third window condition
- Long standing active COM with
  - History of dizziness or vertigo
  - Sensorineural hearing loss
  - High prevalence of positive fistula tests (72%)
- Tullio phenomen: momentary vertigo caused by any loud sound
- Hennebert sign: nystagmus produced by pressure applied to a sealed external auditory canal
- High resolution computed tomography (Thin & continuous sections)

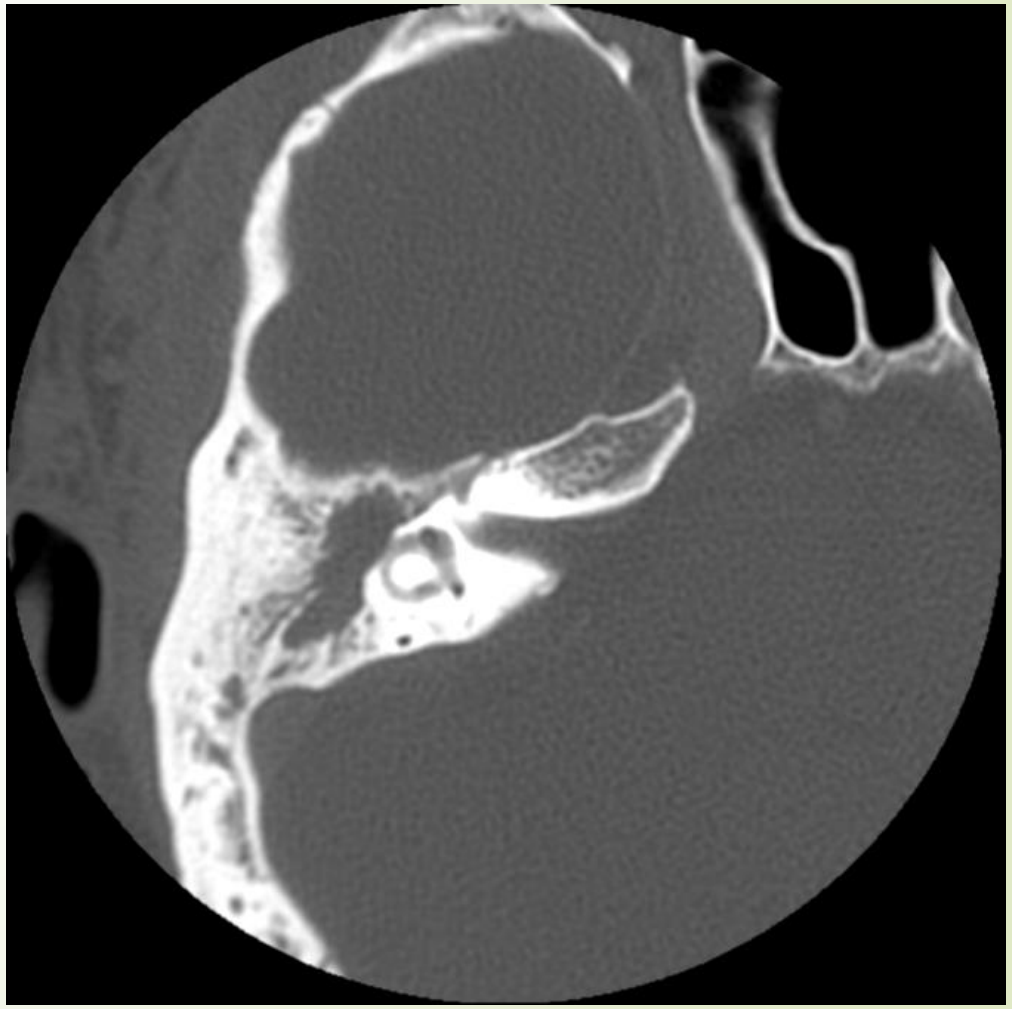
Site of Labyrinthine Fistula and Associated Eye Movements

Site of Fistula	Eye Movements
Lateral canal, postampulla	**Horizontal, toward normal ear**
Lateral canal, preampulla	Horizontal, toward diseased ear
Vestibule	Rotary, horizontal, toward diseased ear
Superior canal, ductal side	Rotary, toward normal ear
Posterior canal	Vertical, with an arc

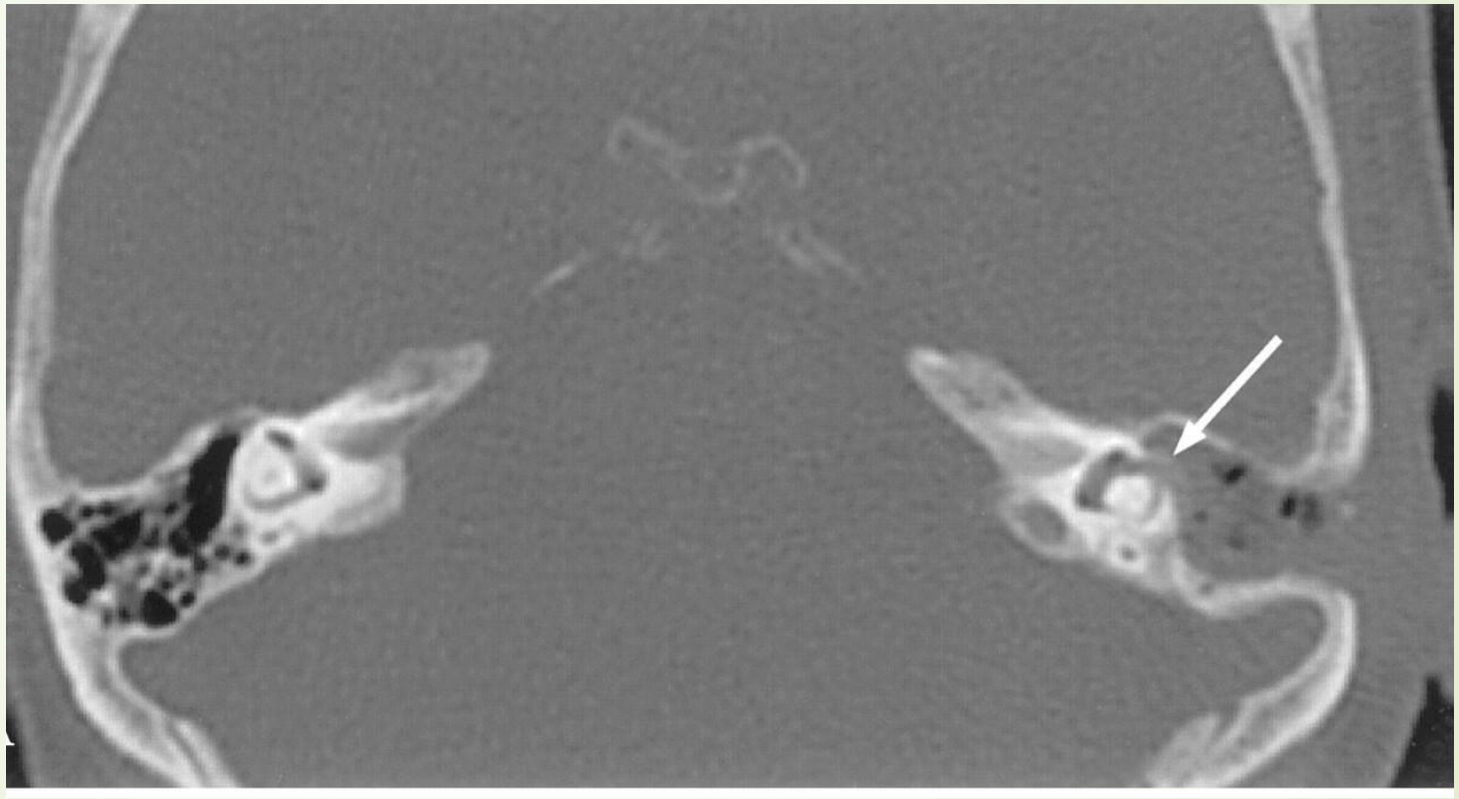
CT Scan





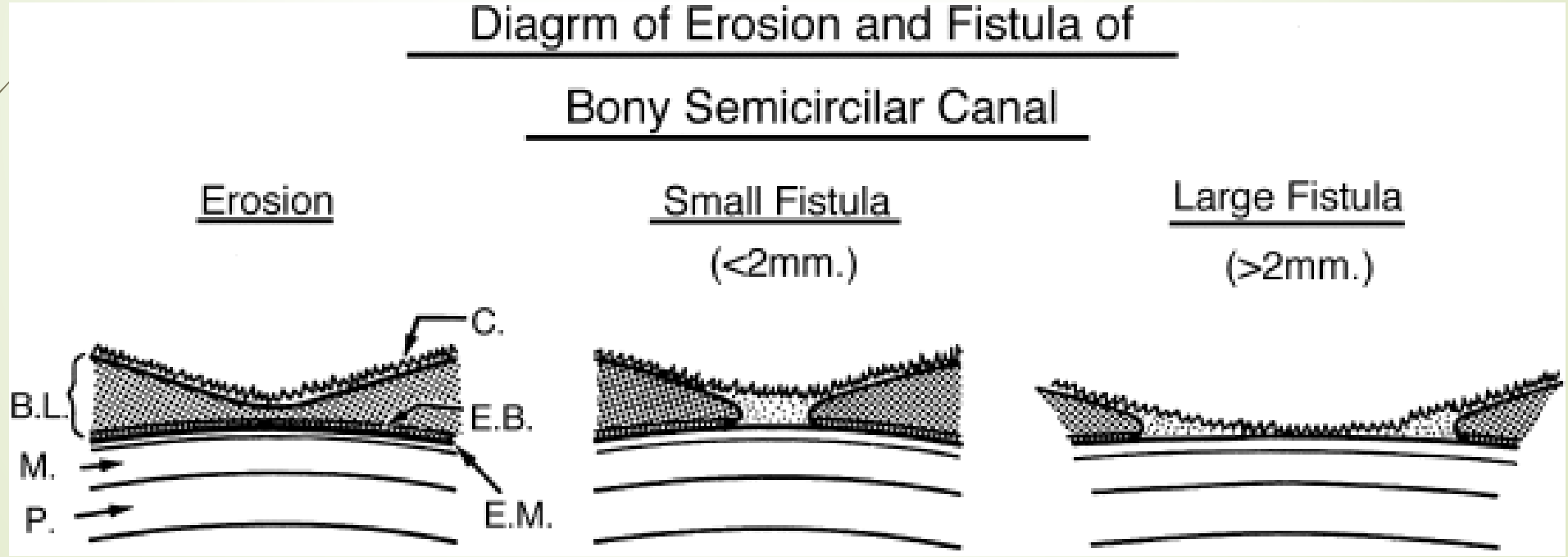


CT Scan



Fistula size

- Most authors classified fistula as large and small with cutoff point of 2mm in diameter



Management of labyrinthine fistula

- Can we remove matrix from fistula or not?
- In which situations we are allowed to remove matrix from fistula?
- Surgical steps
- Obliterating the fistula or not
- Does the repair necessarily require a canal wall-down technique?

Decision to remove matrix or not is based on the following factors:

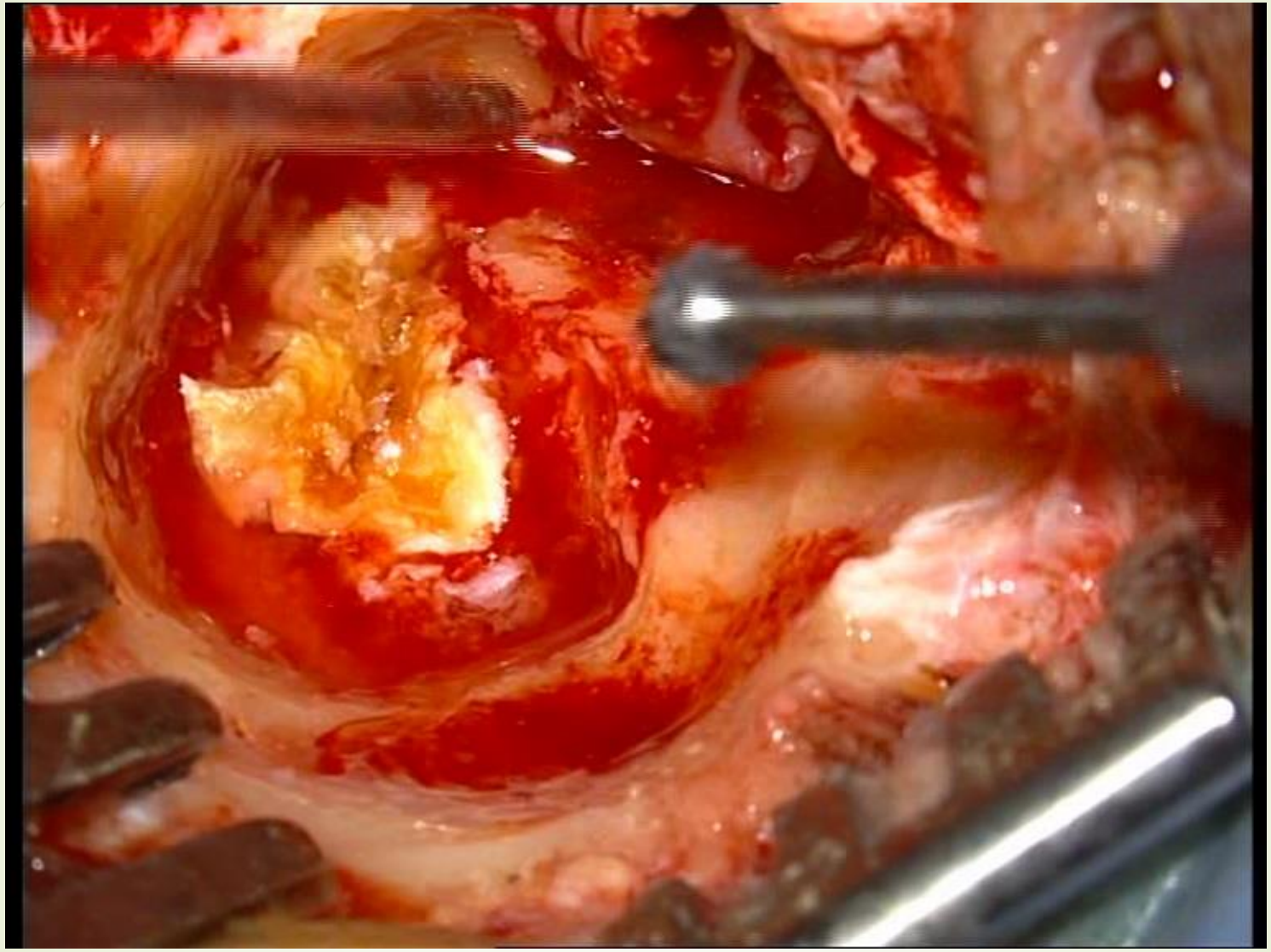
- ***Ability and experience*** *of the surgeon*
- ***Size*** *of fistula*
  - *Small (Less than 2 mm)*
  - *Large (More than 2 mm)*
- ***Location*** *of fistula*
  - *Lateral Semicircular Canal*
  - *Cochlea, Vestibule*
- ***Number*** *of fistula*
  - *One vs. multiple*

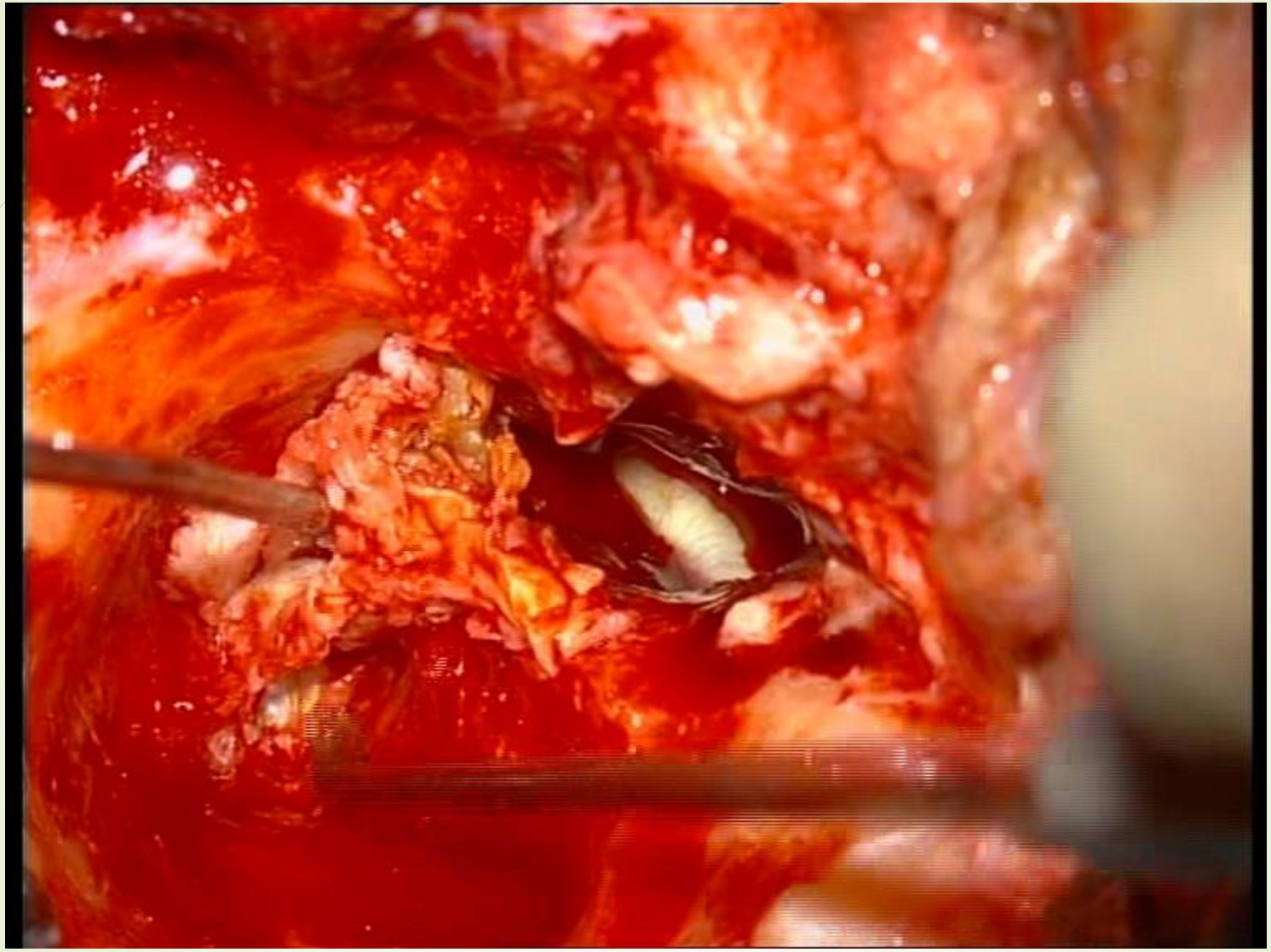
Decision to remove matrix or not is based on the following factors:

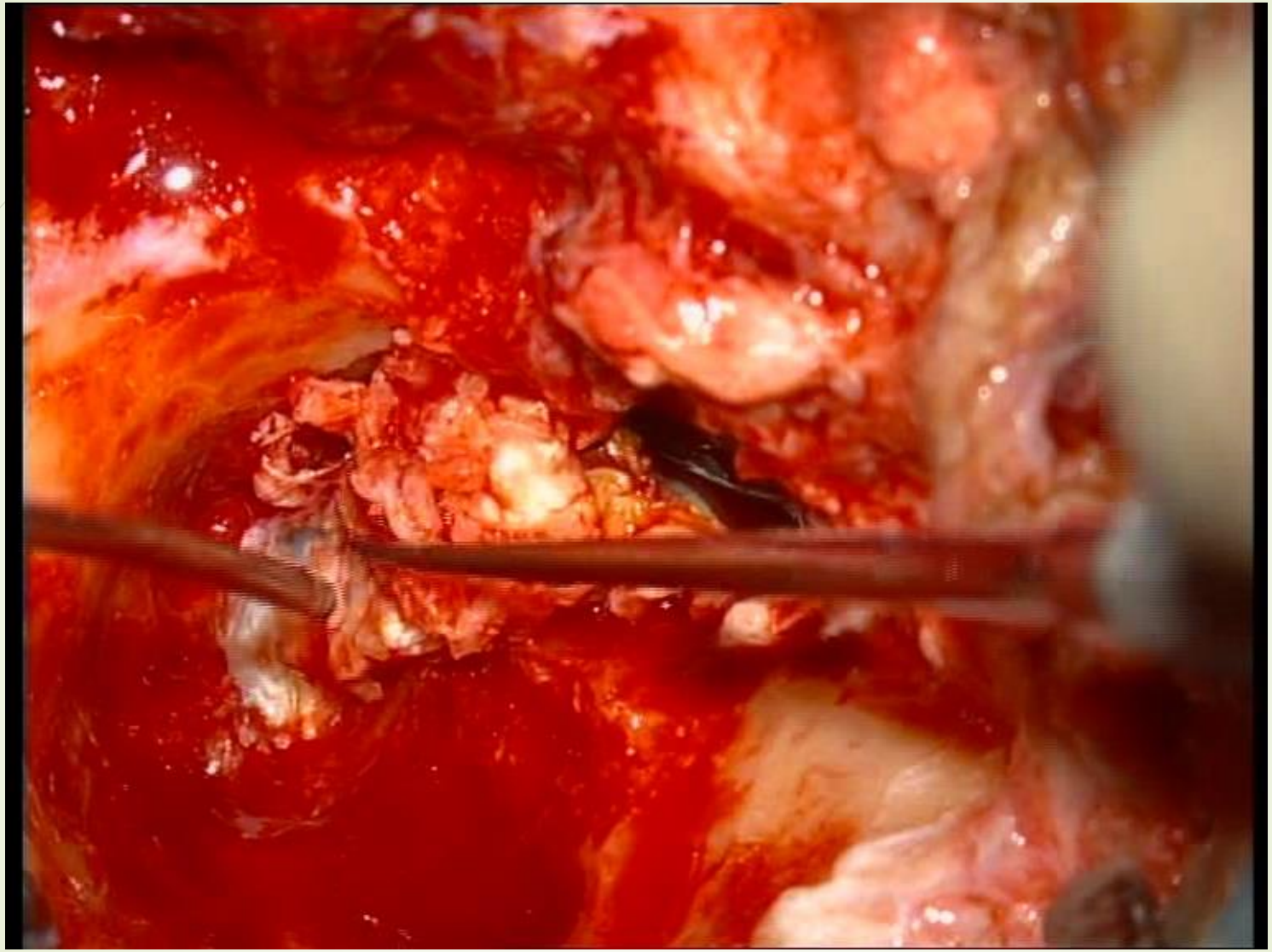
- ***Adherence*** *to the membranous labyrinth*
  - *Dissection should be stopped if the matrix seems adherent to the membranous labyrinth*
- ***Function of both ears***
  - *Better ear: Experienced surgeon, fistula<2mm*
  - *Deaf ear: Matrix removal*
- ***Granulation tissue*** *on fistula*
- *Main complain of patient*
  - *Vertigo*

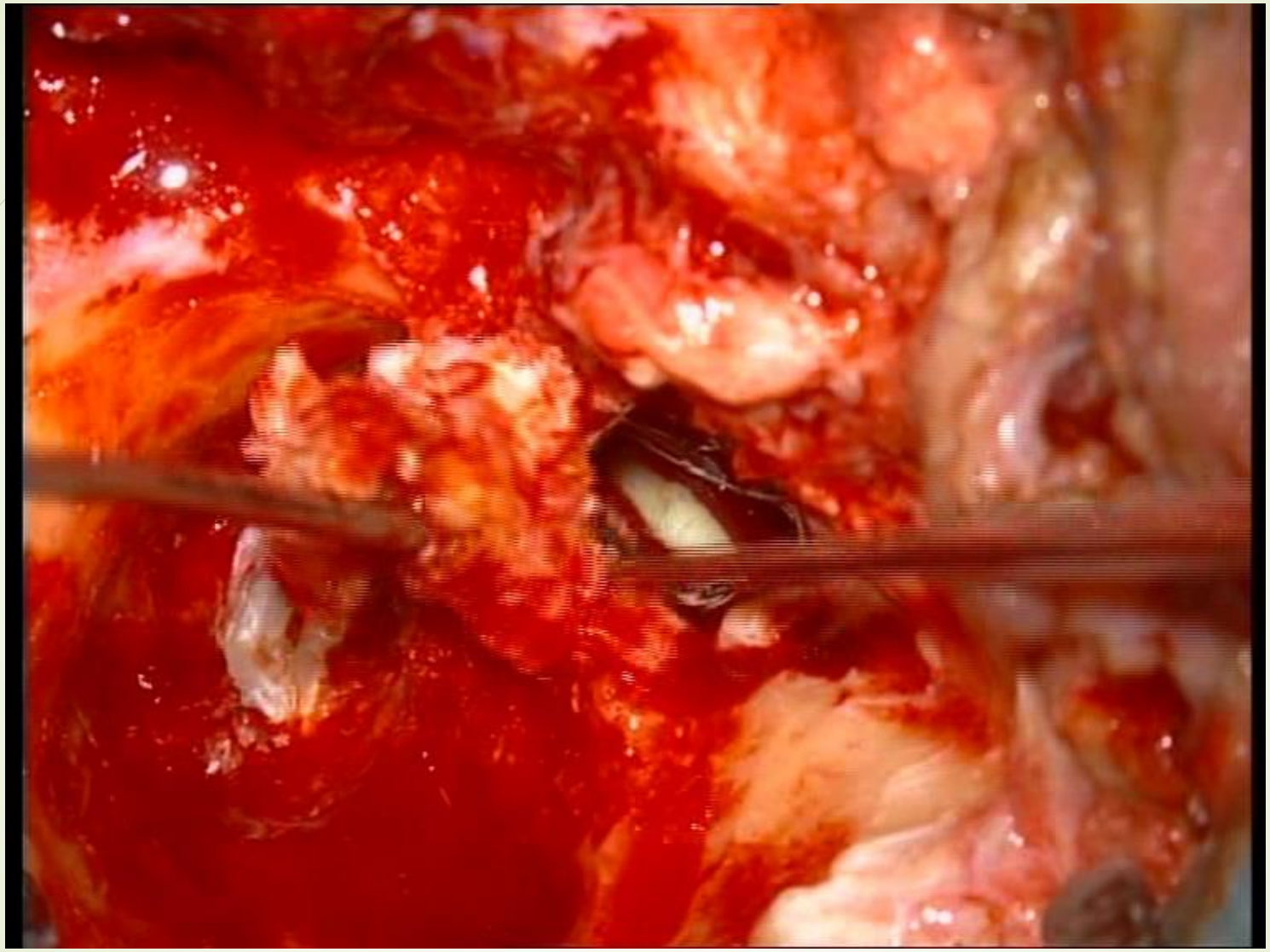
Surgical Steps in fistula management

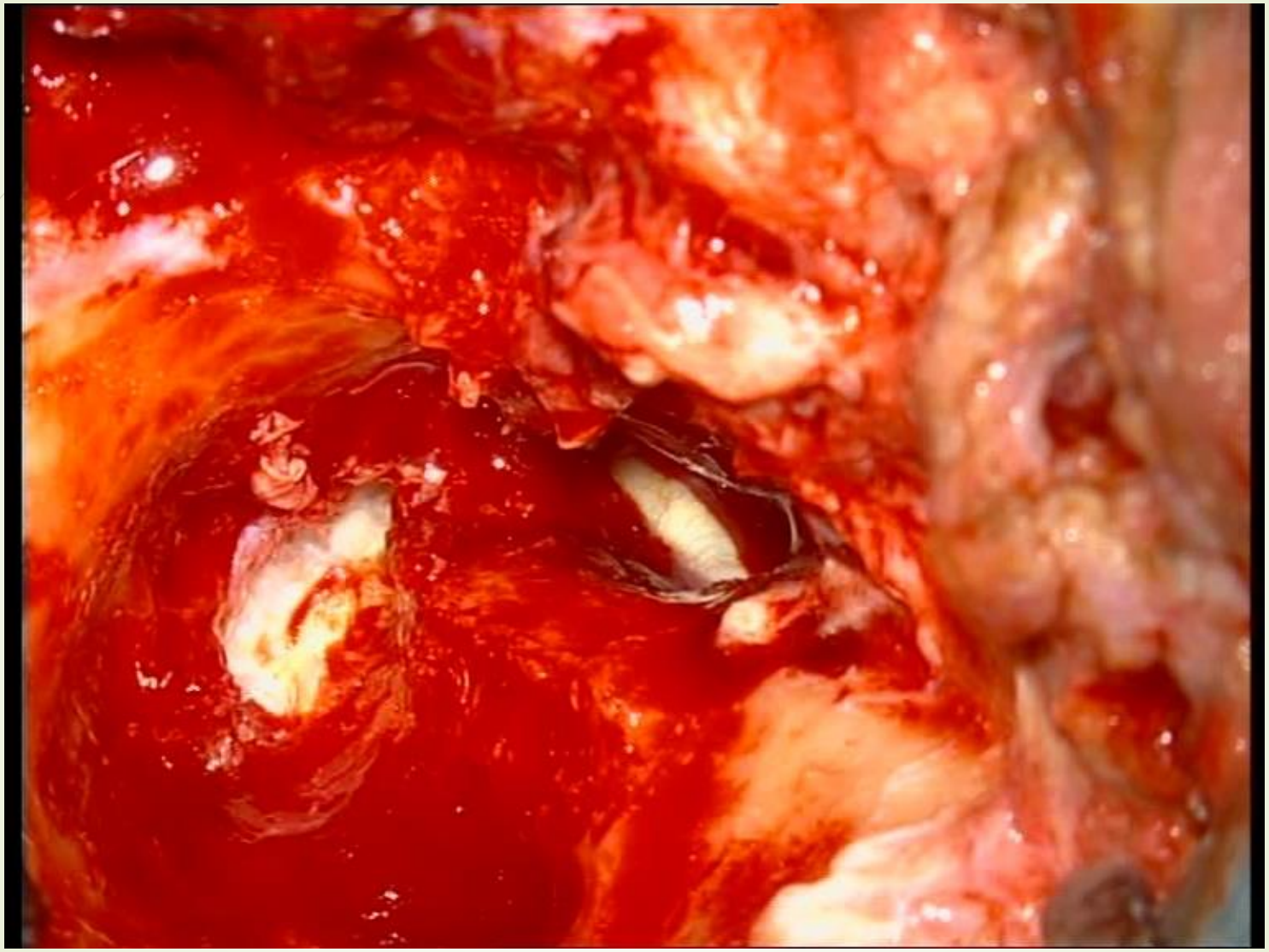
- Open and evacuate any cholesteatoma sac in the mastoid and carefully palpate the medial wall to detect any bony erosion—especially on the dome of the lateral canal
- Leave matrix over any fistula to protect it, even if planning removal, focus on the rest of the ear disease
- Any matrix removal is done immediately before closing
- When exposed, avoid suctioning and quickly cover the fistula with tissue such as fascia, vein, or perichondrium
- Leave matrix alone whenever fistulas are extensive, multiple, or involve the vestibule or cochlea

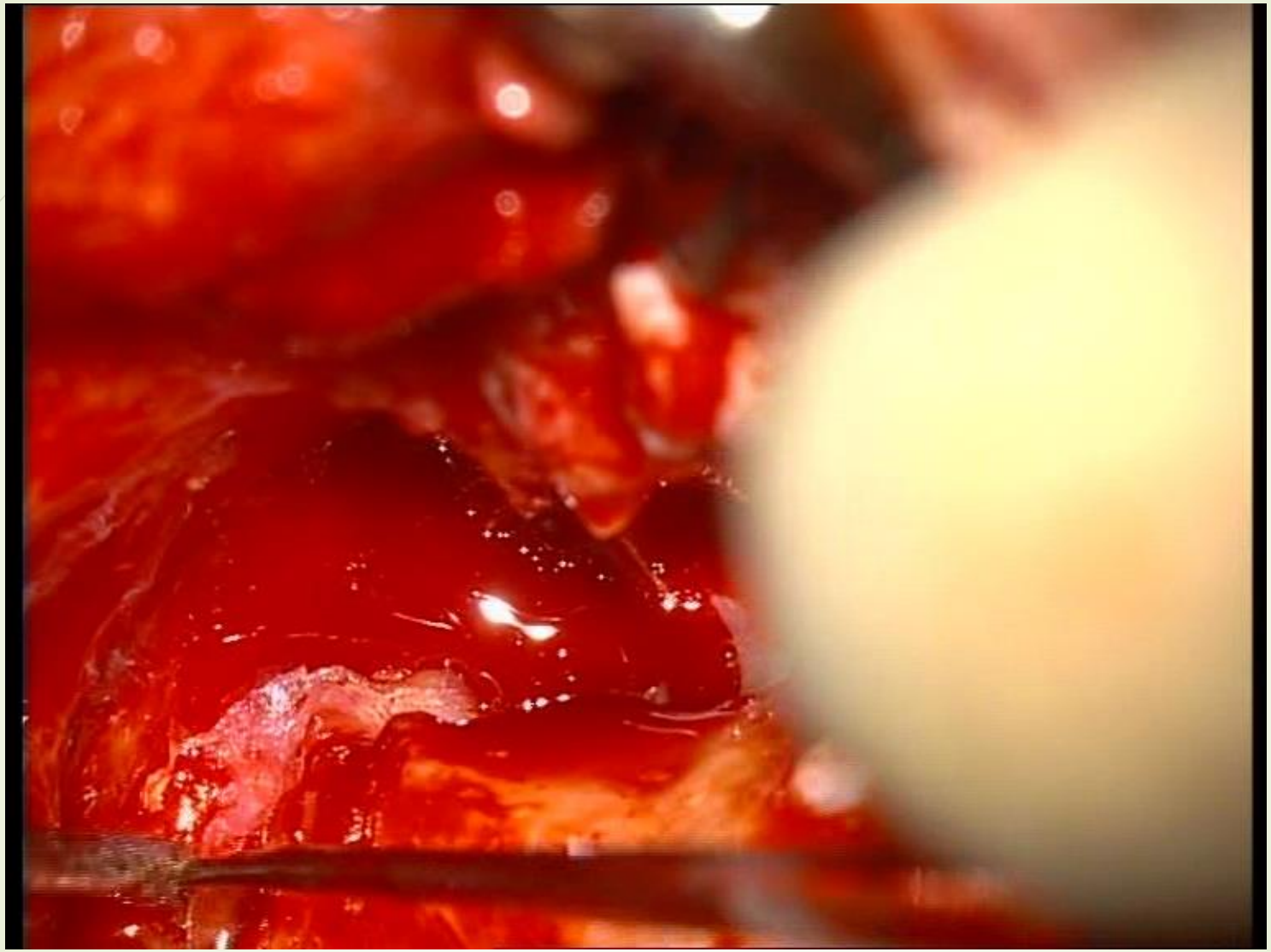




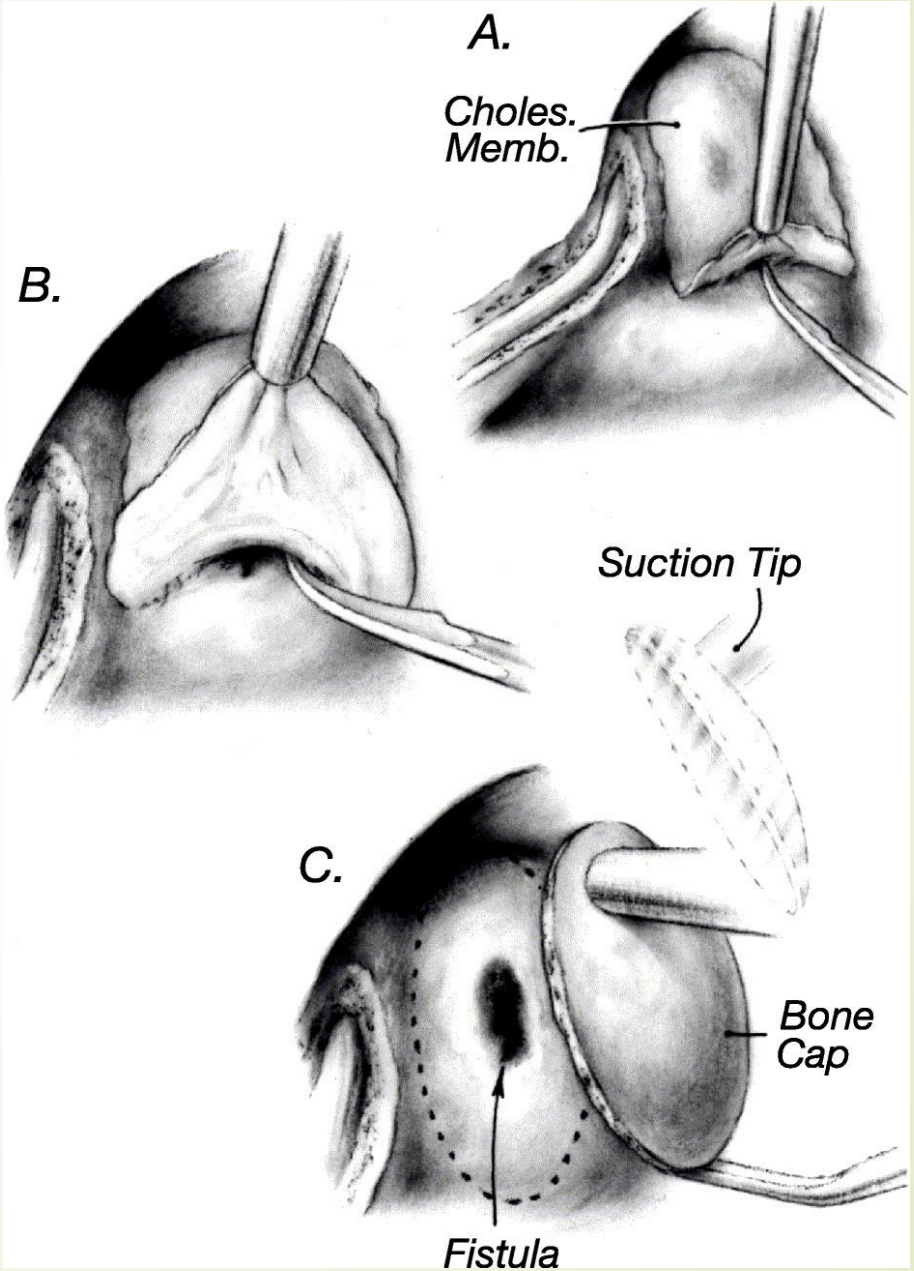






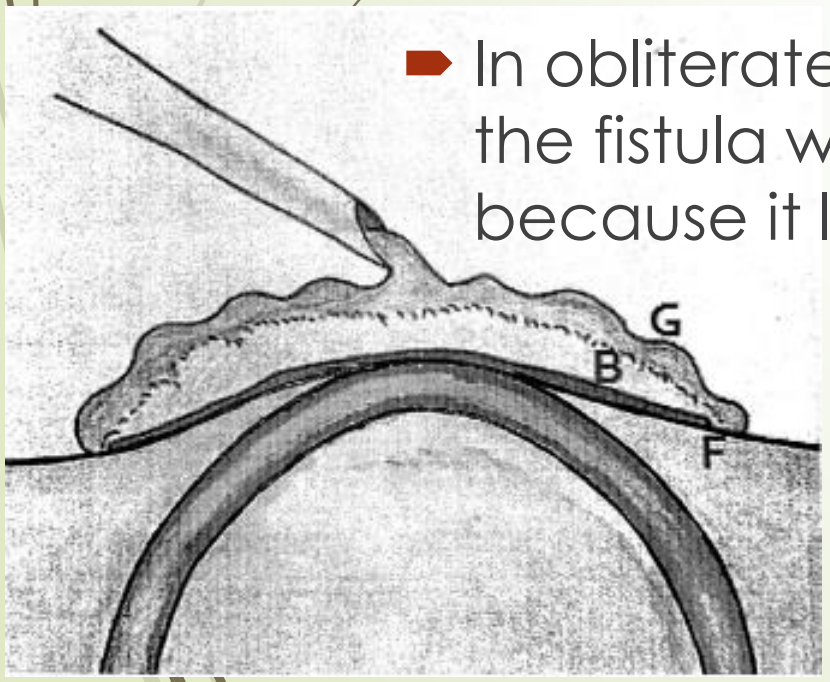


Surgical steps



Sealing the fistula or not

- When your attempt to remove epithelium from fistula was successful, it is better to seal the fistula with bone dust and fascia.
- If feasible add fibrin glue over the bone dust
- When you leave epithelium over fistula, don't try seal it
- In obliterated oval or round window by plaques leaving the fistula without obliteration is recommended because it leads to better hearing



Sealing the fistula or not

- Leaving the fistula opened leads to vertigo or dizzy sensation during these conditions:
  - **Warm or cold wind or water** in touch with open cavity procedures
  - **Loud sound** and positive pressure in both open cavity and intact canal wall.

Does the repair necessarily require a canal wall-down technique?

- Historically labyrinthine fistula was indication of CWD
- If it is possible to perform intact canal procedure, you are allowed to do it in the presence of fistula.
  - After removing the matrix seal the fistula
  - When you leave the matrix on fistula, try to remove it 6 months later (removable pearl in sterile field)


THANK YOU
For your attention