

PEEP SHOW
IN
SUDDEN HEARING LOSS

Reg.No.M8908

AN INDEPENDENT PROJECT WORK SUBMITTED IN PART FULFILMENT FOR
FIRST YEAR M.Sc., (SPEECH AND HEARING) TO THE UNIVERSITY OF MYSORE

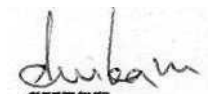
ALL INDIA INSTITUTE OF SPEECH AND HEARING: MYSORE - 570 006.

MAY 1990

MY DEAR THATHA & PATTI
AND
TO ALL PEOPLE FOR WHOM IT
IS INTENDED

CERTIFICATE

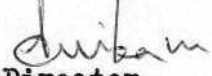
This is to certify that the Independent
Project entitled: PEEP SHOW IN SUDDEN HEARING
LOSS has been prepared under my supervision
and guidance.


GUIDE

CERTIFICATE

This is to certify that the Independent Project entitled: PEEP SHOW IN SUDDEN HEANING LOSS is the bonafide work done in part fulfilment for First Year M,Sc., (Speech and Hearing) of the student with Register Mo.M8908.

Mysore
May 1990


Director
All India Institute of
Speech and Hearing
Mysore-6

DECLARATION

This Independent Project entitled: **PEEP SHOW**
IN SUDDEN HEARING LOSS is the result of *my* own study
undertaken under the guidance of *Dr.* (Miss) S.Nikam,
Professor and Head, Department of Audiology, All India
Institute of Speech and Hearing, Mysore and has not
been submitted earlier at any University for any other
Diploma or Degree.

Mysore
May 1990

Register, No, M8908

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ACKNOWLEDGEMENTS

My sincere thanks to Dr.(Miss) S.Nikam, Professor and Head of the Department of Audiology, All India Institute of Speech and Hearing, Mysore for her guidance and help.

I sincerely thank the Director, AIISH, Mysore for having given me an opportunity to undertake this study.

'akka' you have been a source of immense help and moral support. Thank you.

I don't think Jyots and Yam will forget my nagging them. Thank you for bearing with me.

Among friends there is no THANK YOU. But... it is the least I would like to convey to all my colleagues including . . . !!!

INTRODUCTION

Facts are shocking BUT figures illuminate them!
Hence, here we 'GO' to get an insight into
the multifaceted facts of Sudden Hearing Loss!!!

Deafness, never of itself
Killed anyone, BUT who can count
the lives it has wasted!

So folks, ARISE, AWAKE and STOP not till you've
cast your ignorance!

A GLIMPSE, a GLANCE, a PEER, a PEEP is
all that is required now - to get to know about
an entity which was practically unknown a few
decades ago. Nowadays, everybody seems to know
what Sudden Hearing Loss is?

But do we really know? Is it a disease
of its own? Has it split up....?

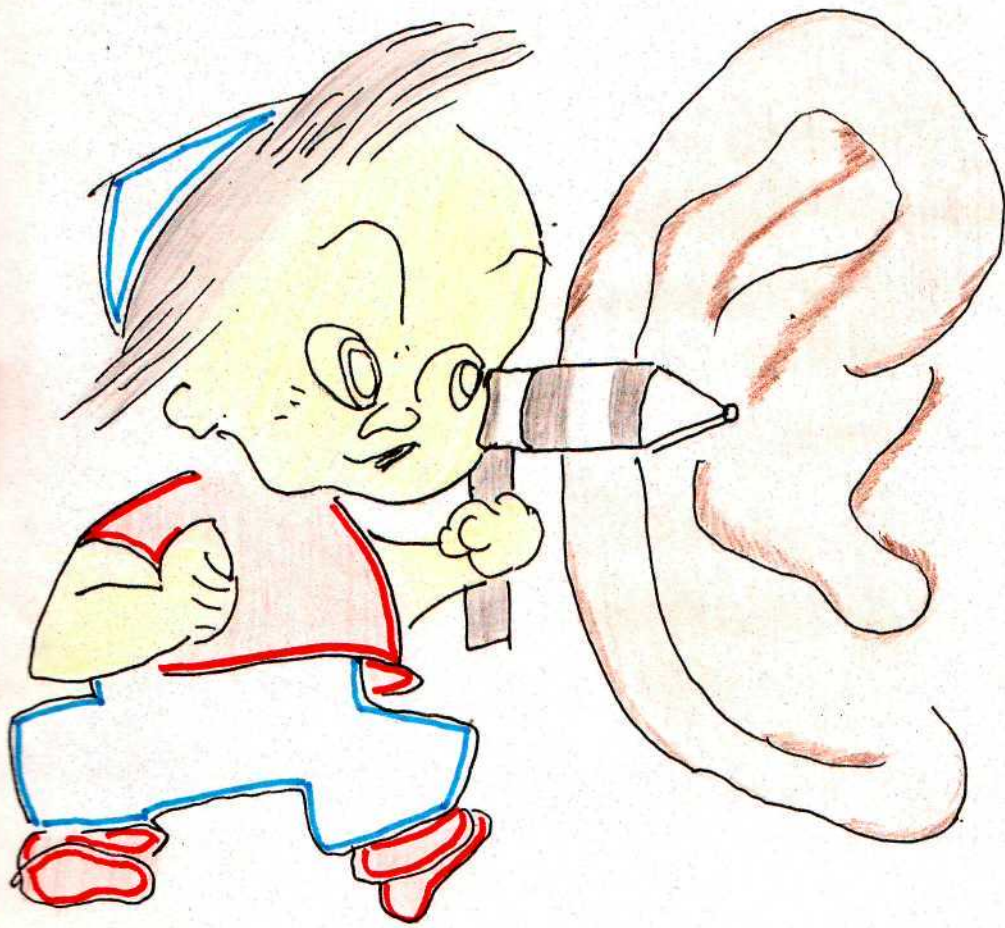
The sudden onset of severe or total hearing
loss is a most dramatic event in the life of
the person who is so afflicted. Its causes are
frequently obscure. Its symptoms are varied and
often fluctuate. Treatments have run the gamut
from verbal reassurance to radical surgery to the
application of leeches. The prognosis, known so far is
a matter of chance.

But then, has man ever settled with the
attitude of the fox who considered the unattainable
grapes sour?! If it were so then progress would be
unknown. It is his quest for knowledge and the
drive to unravel the unknown aspects of events and
phenomena that has won him in the race against
the phenomena/events.

It is with this in mind, that we "PEEP" into the domain of this mysterious event of Sudden Hearing Loss:

- to get an idea of what is KNOWN about it ; what has been unravelled so far ;
- which in turn, will help in sowing new seeds of knowledge about the unknown ;
- and thus pave the way for future advances .

Focus



Well let's introduce you to the one in FOCUS today - OUR EAR!

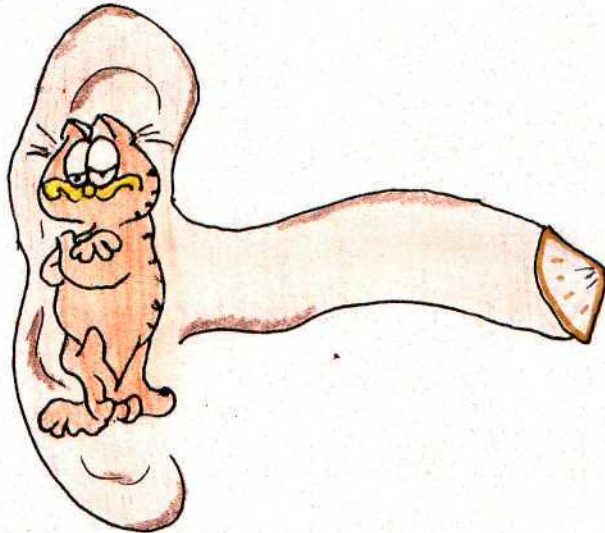
OUR EAR has had the honour of playing a triple role.



It has 3 distinct parts each unique but distinct synchronous with each other.

EXTERNAL EAR

PINNA



FUNCTION

PINNA

- collection
- direction
- localization of sound

EXTERNAL AUDITORY CANAL

- one inch long
- open at the visible end & closed at the other end by eardrum
- skin secretes wax

EXTERNAL AUDITORY CANAL

- useful for boosting sounds.



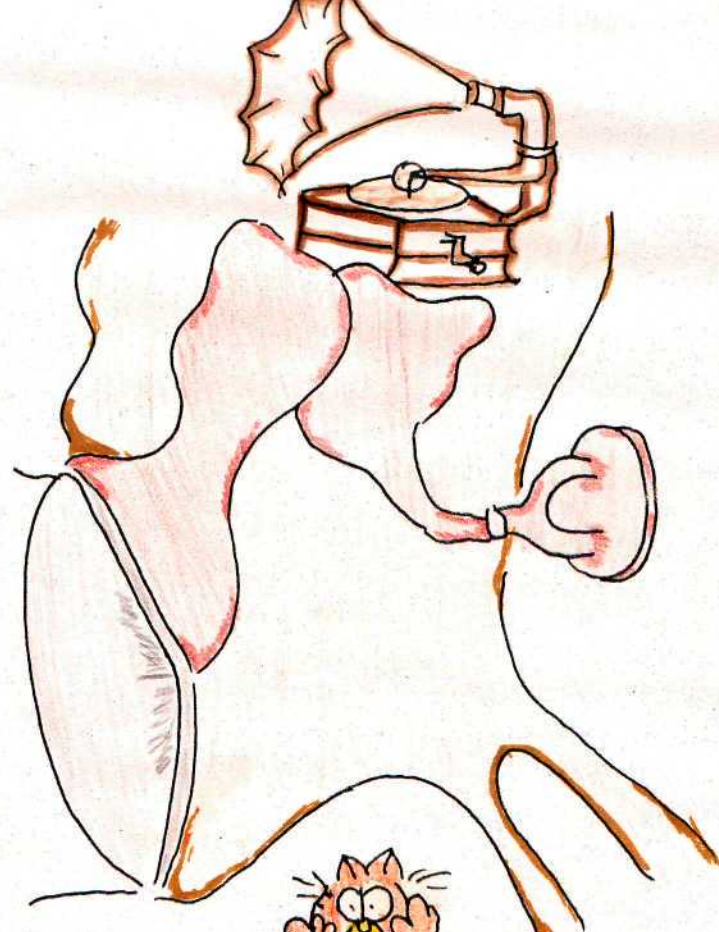
Protection from foreign body entry

TYMPANIC MEMBRANE



- Helps in reducing energy loss along with the middle ear
- vibrates in response to air pressure changes in the ear canal.

MIDDLE EAR
 • air filled cavity
 • includes chain of 3 smallest bones of the body :-
 i) Malleus
 ii) Incus
 iii) Stapes
 (Ossicular chain)
 controlled by 2 muscles → Tensor tympani & stapedius



FUNCTIONS
 • safe and intact transmission of the signal to the inner ear

• Protect the inner ear

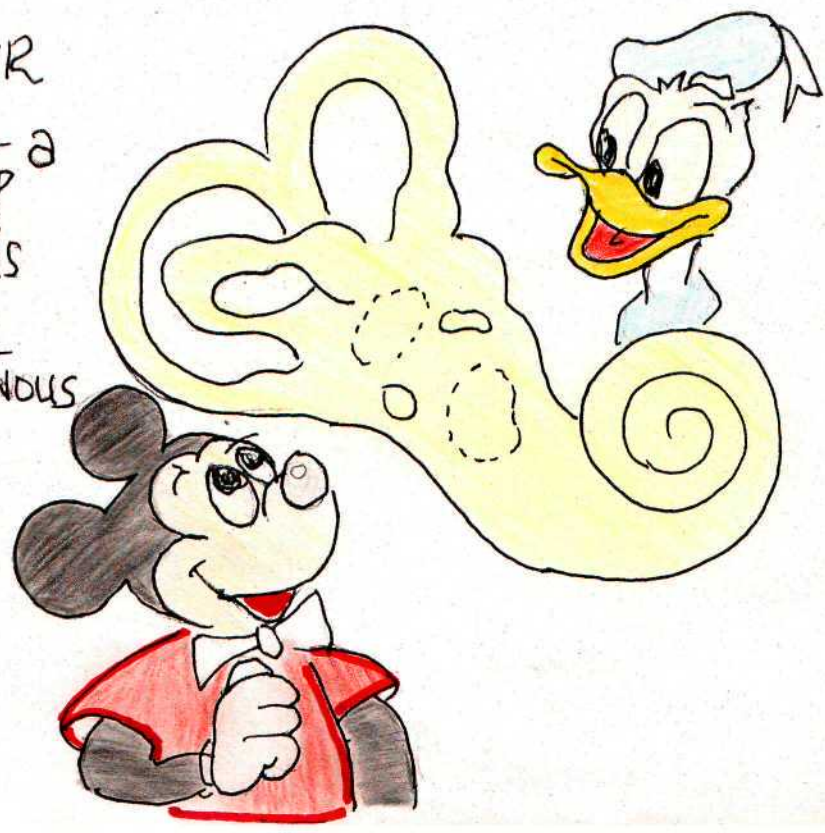
- Equalization of pressure.

EUSTACHIAN TUBE



INNER EAR
 Labyrinth - a structure of winding paths

NY MEMBRANOUS

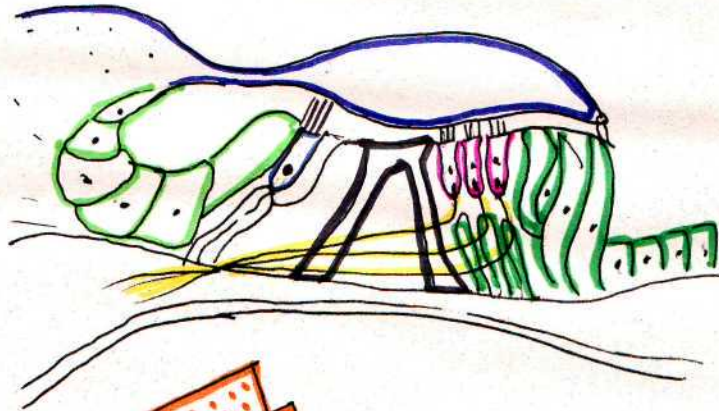


• Transmission of sound to the brain.
 • Maintenance of Balance

CONTENTS

COCHLEA

- snail shaped
- includes Organ of Corti with sensory hair cells



FUNCTION

Organ of hearing

It's movement sets up electrical signals that are carried to the brain by the 8th cranial nerve.



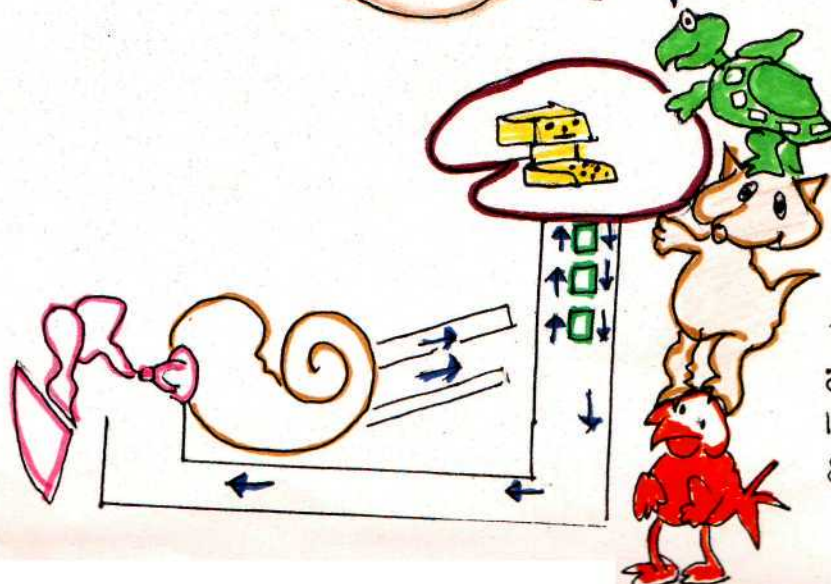
Vestibule and Semicircular canals

Organ of Balance



EAR & BRAIN

Includes the path between ear & brain which is a two way traffic with many stations.



8th nerve fibres pass thro' these stations to the hearing centres of the brain, where the signal is analyzed & interpreted as sound.

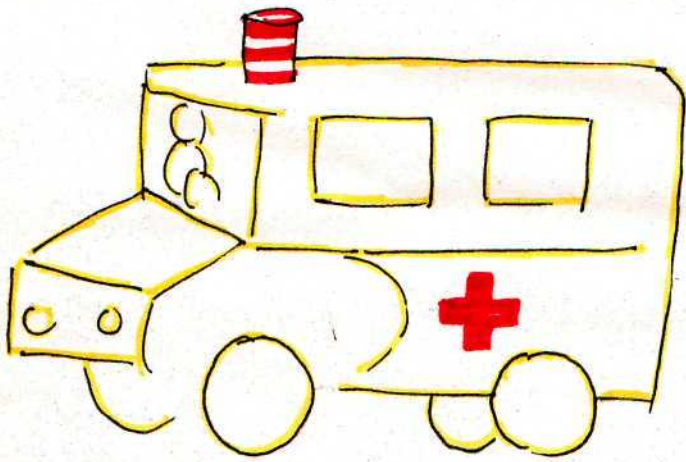
CURTAIN RISES &



SHOW BEGINS

Coming to the crux of the show - SUDDEN HEARING LOSS!

Before we go onto unearthing the facts of this enigmatic act, we have for you a brief note on Sudden Hearing Loss.

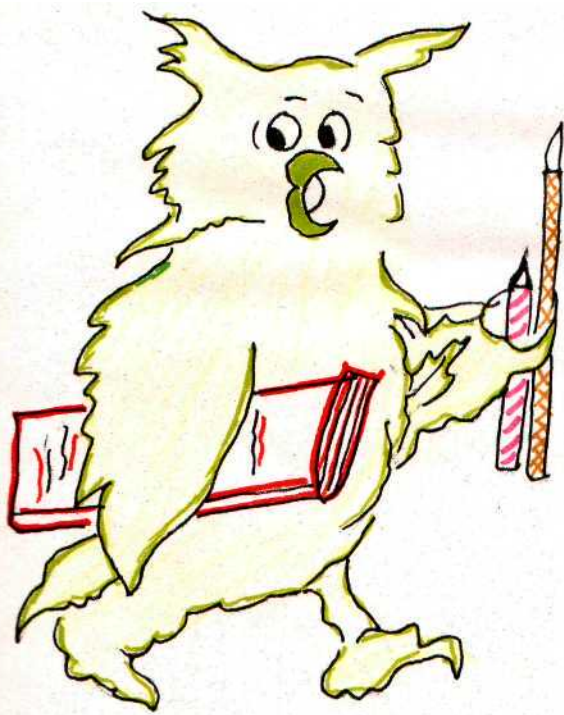


Sudden Hearing Loss is an otologic emergency!

It is defined as a hearing loss that the patient notices in an instant or one that progresses over 24-48 hours.

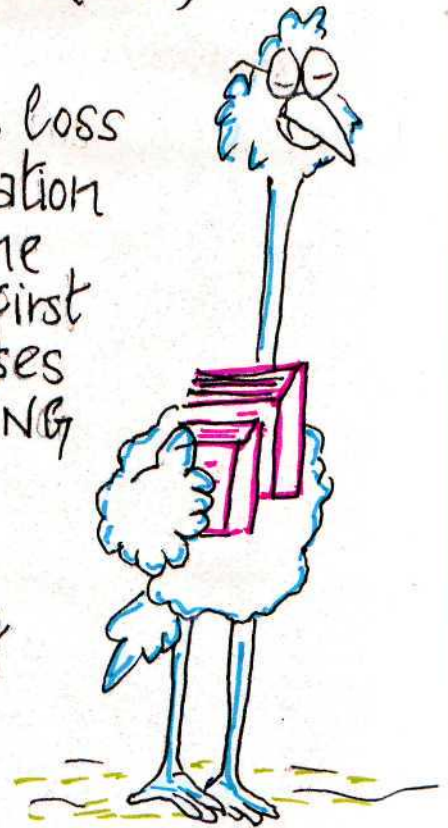


Sudden hearing loss can occur as the result of lesions in external, middle, or inner ear or as a result of brain lesions.



The first reported case of Sudden hearing loss is attributed to PROSPER MENIERE (1861)

Sudden hearing loss being a manifestation of Cerebello-Pontine Angle tumor was first mentioned in 2 cases published by LUSHING (1914)



Sudden deafness presenting as the initial symptom of an Acoustic Neuroma was first described by HALBERG (1956)

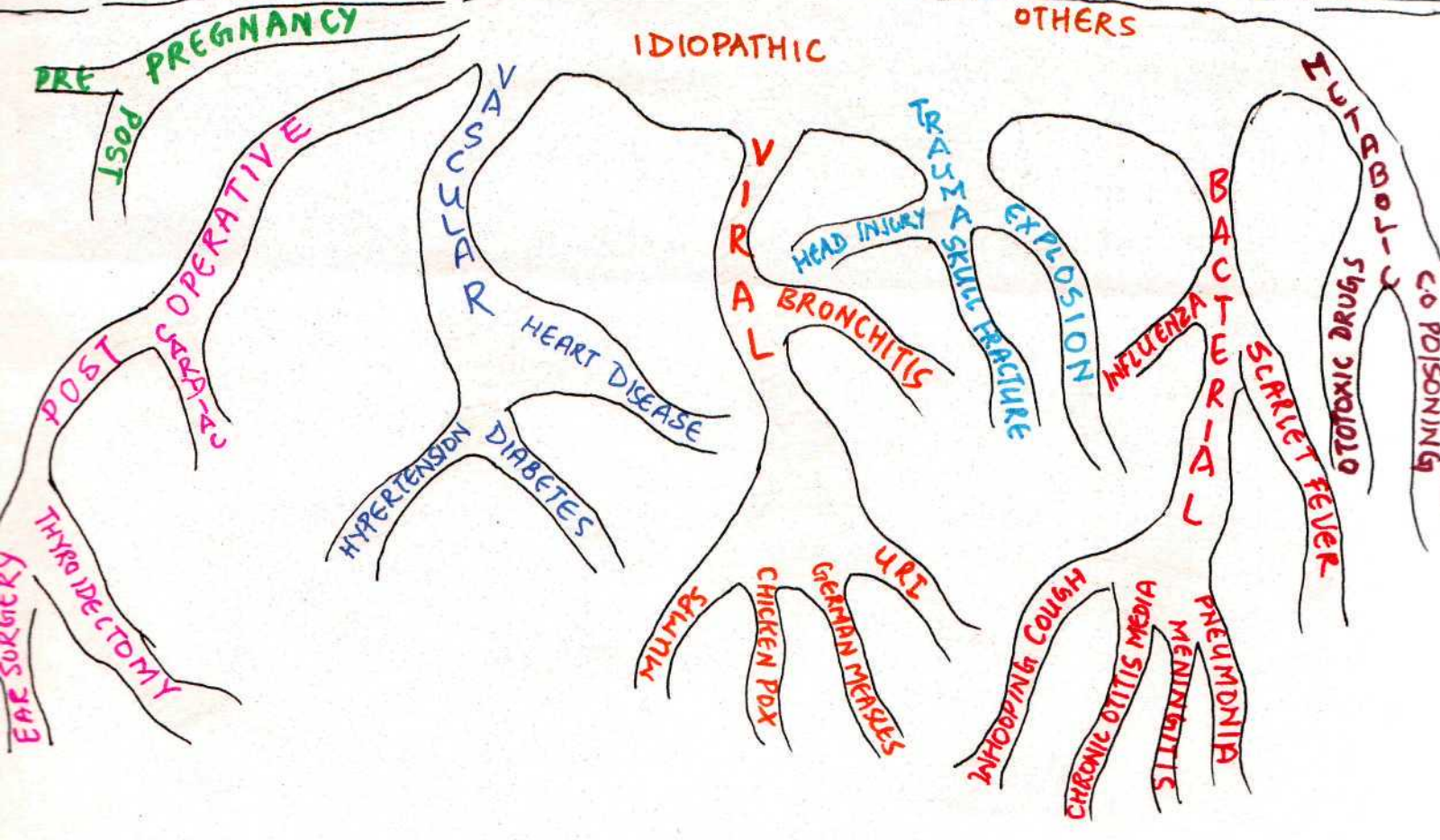
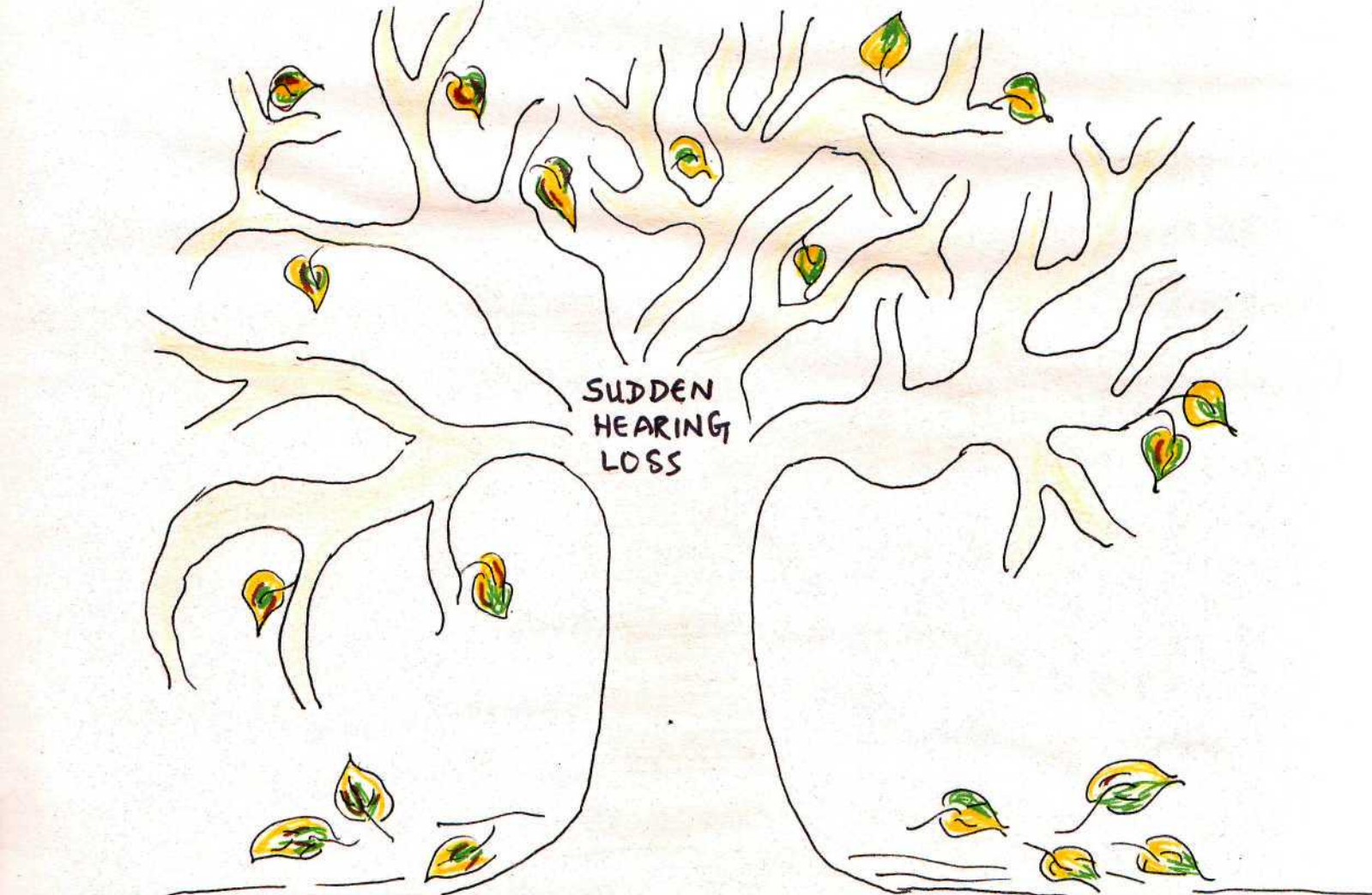
It is usually unilateral and permanent.

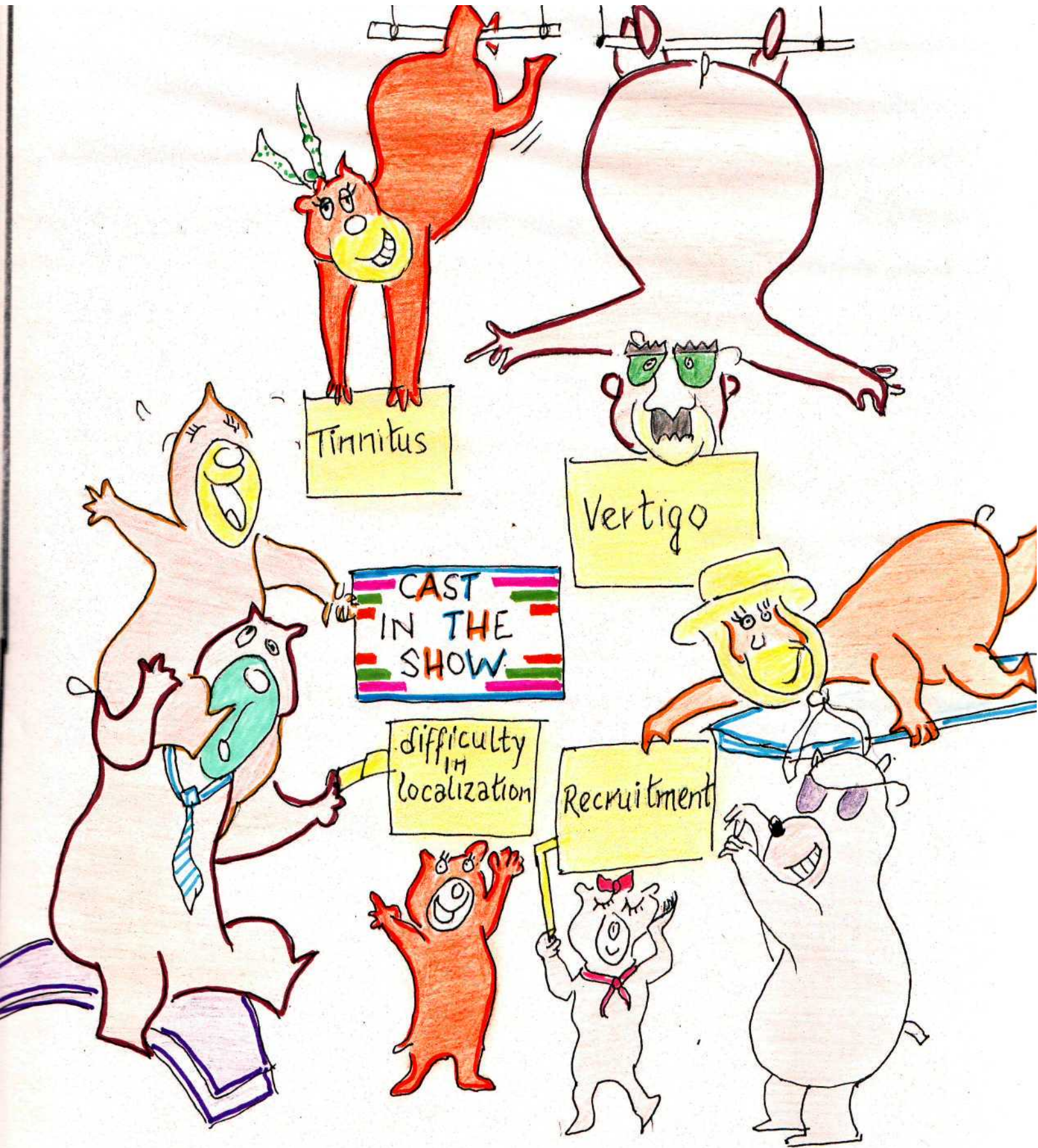


PRODUCERS OF THE SHOW



Well, who conceived this show?
Who made it possible?
Of course, the ROOTS will tell you!





Neither the cast nor the characters are fictitious in sudden hearing loss. The entire TROUPE may not participate in every performance of the show or play a lead role always. The cast and the characters played can be in different configurations.



TINNITUS

- changing in pitch
- tickling or roaring type
- usually subsides within a month.

VERTIGO

mild or incapacitating
less in sensorineural lesion
rare in retrocochlear lesion



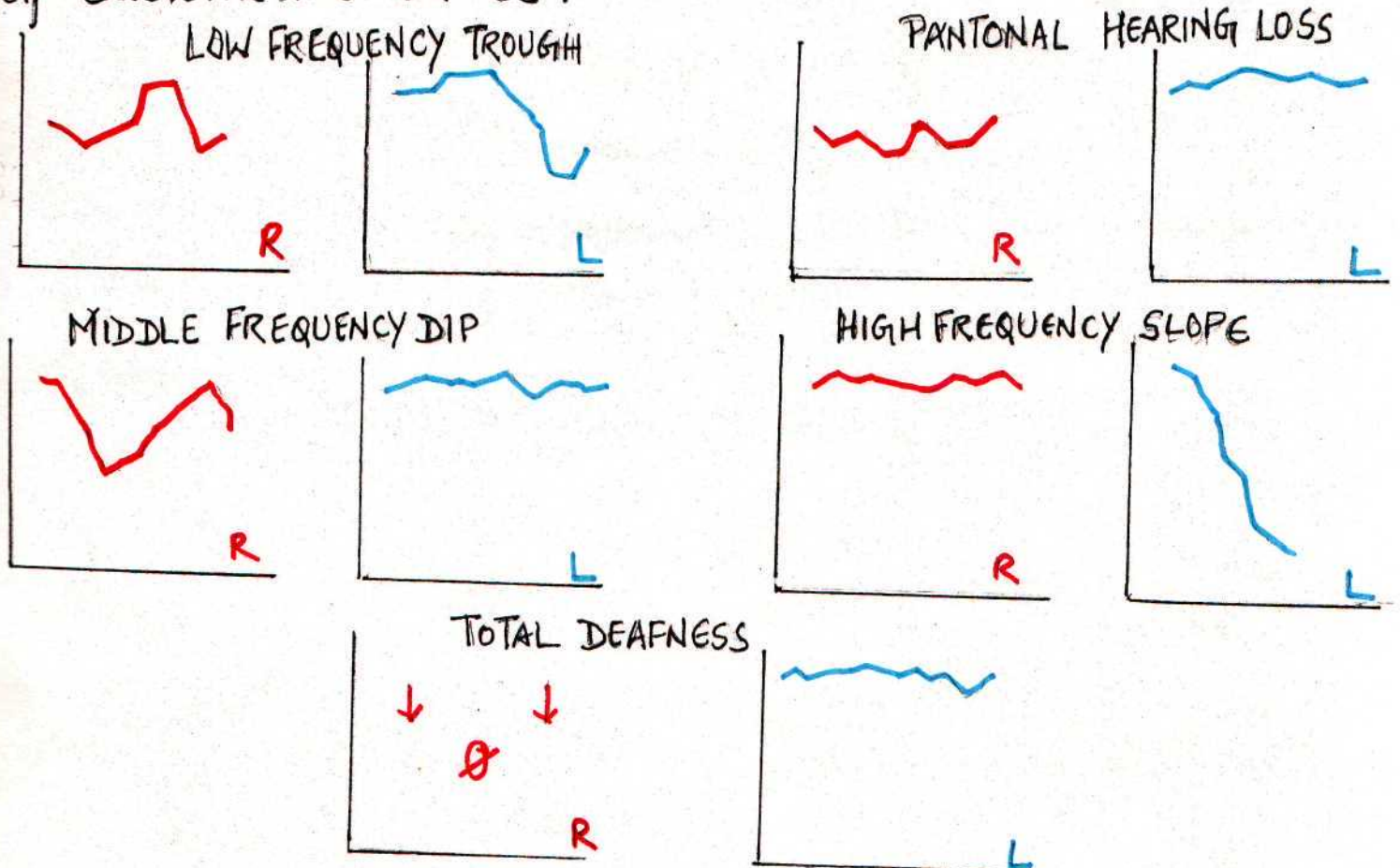
Difficulty in
localization.



RECRUITMENT

AUDIOLOGICAL IMPLICATIONS

Sudden Hearing Loss may present a great variety of audiometric curves :-



GENERAL AUDIOLOGIC PROFILE

Short Increment Sensitivity Index test
Result: Positive

Alternate Binaural Loudness
Balance test: Positive

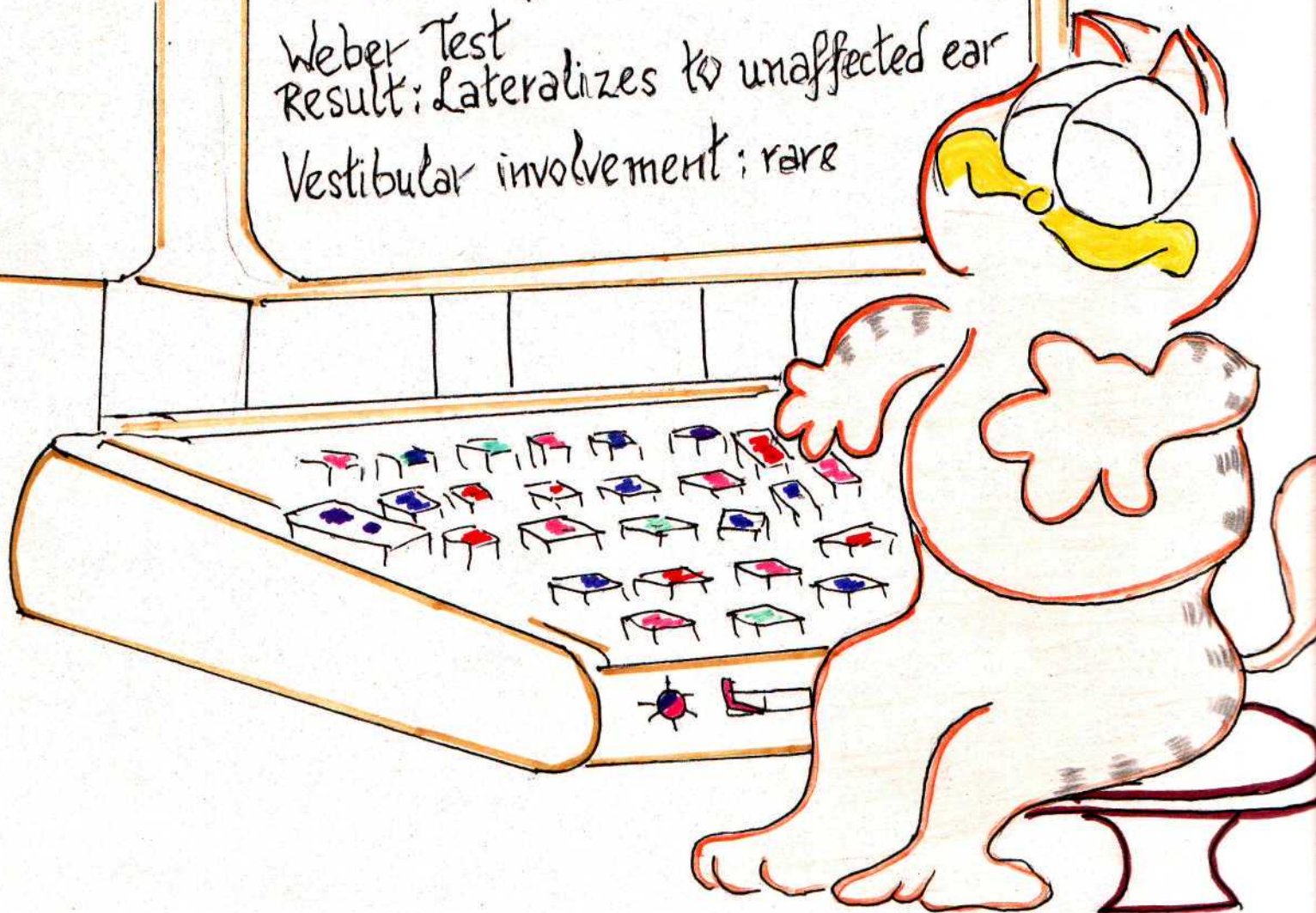
Speech Discrimination Test
Result: Poor Score

Bekesy Audiometry
Result: Type II or III

Tone Decay Test
Result: Negative

Weber Test
Result: Lateralizes to unaffected ear

Vestibular involvement: rare



Audiologic Profile in :-

- Sudden Neural loss
- Low SISI;
 - Bekesy Type III;
 - Non measurable SDS;
 - Minimal Recruitment

- Sudden Cochlear loss
- High SISI;
 - Bekesy type II;
 - Low SDS
 - Some Recruitment

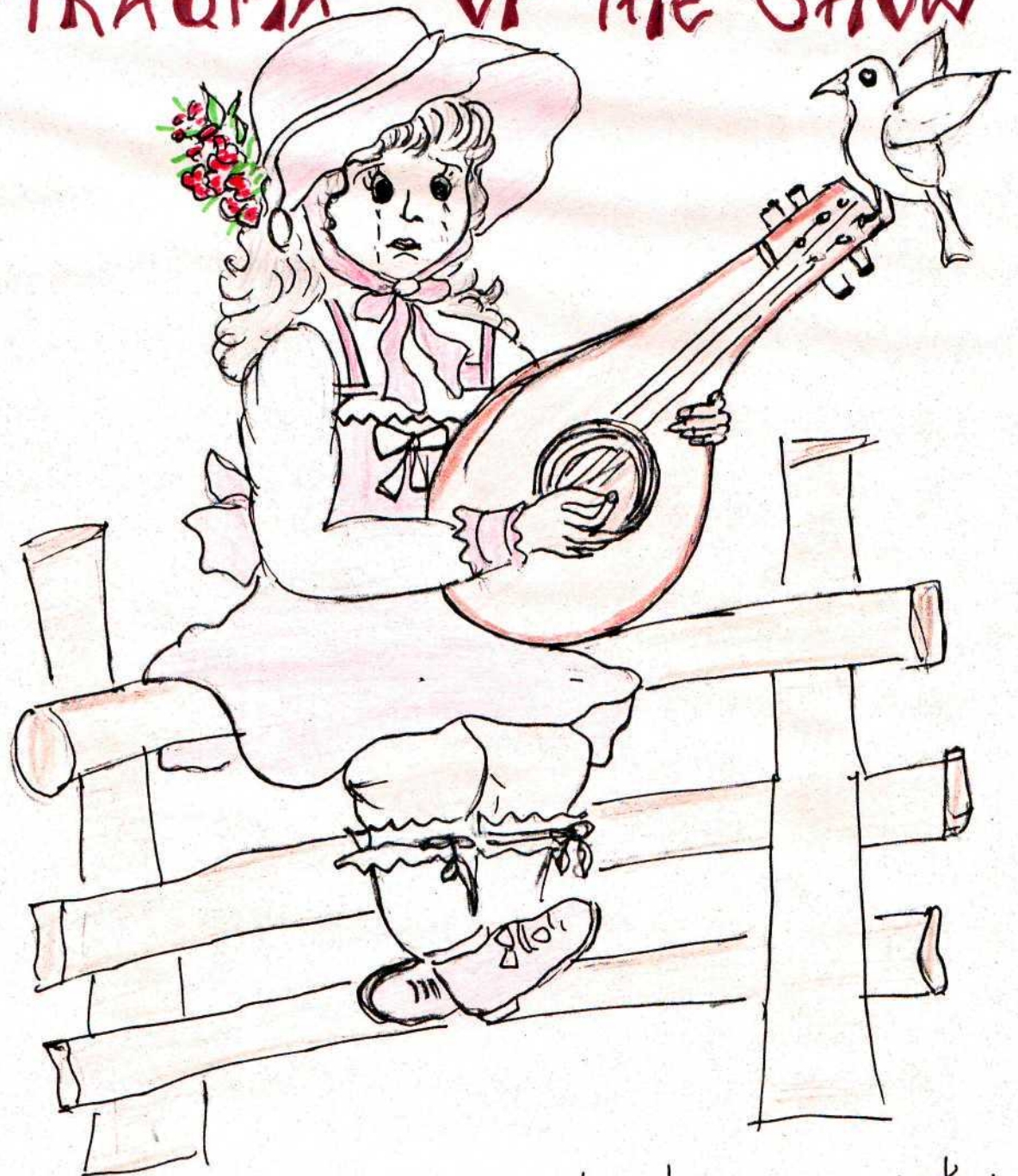
- Sudden loss due to explosion:
- High frequency loss;
 - Vestibular Vertigo not evident.

- Sudden loss due to high intensity noise:
- unilateral always;
 - flat audiogram;
 - Recruitment

- Sudden loss associated with Mumps:
- Bone conduction threshold lower than air conduction;
 - SRT higher than average
 - pure tone loss;
 - low SDS;
 - Indication of Recruitment



MELODRAMMA OF THE SHOW



Any show can have a traumatic turning point in its course. So does **SUDDEN HEARING LOSS**! The behavior of the cast are like the puppets in the hands of the producers? How do the producers get to have such a strong hold on **OUR EAR**? What do they bring about?

Here, we have for you a glimpse of that melodramatic event of the show!!

ROUTES OF ENTRY



Virus $\xrightarrow{\text{viremia}}$ Membranous Cochlea

Virus \longrightarrow Perilymphatic space from subarachnoid space \longrightarrow Cochlear aqueduct \longrightarrow Inner Ear

Virus \longrightarrow Middle ear \longrightarrow Inner ear

Otitic-Barotrauma \longrightarrow Rupture of labyrinthine window membrane

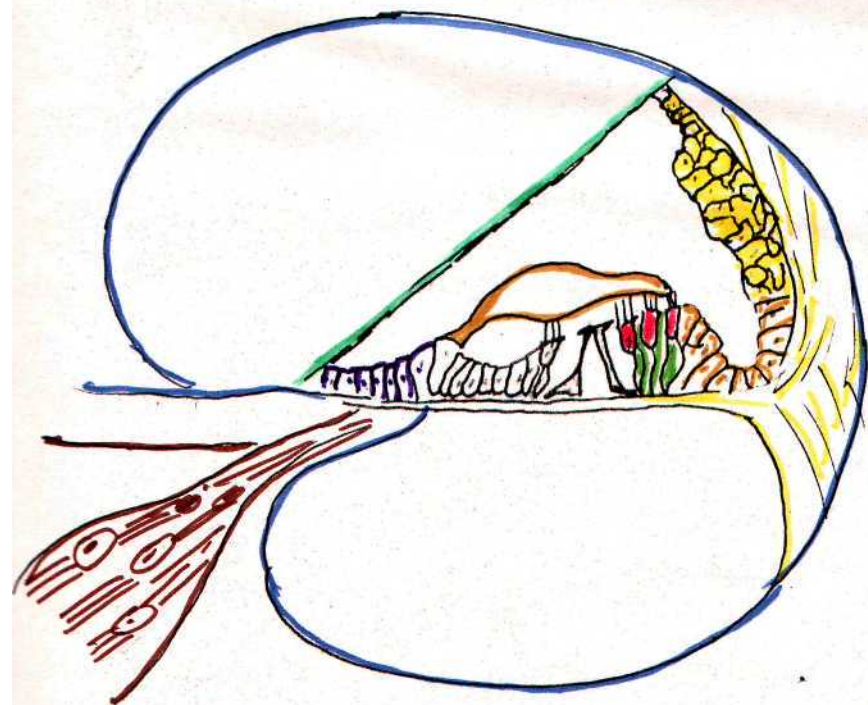
\downarrow
Pressure on Reissner's, Basilar, and Tectorial membranes

\downarrow
Rupture of the membranes

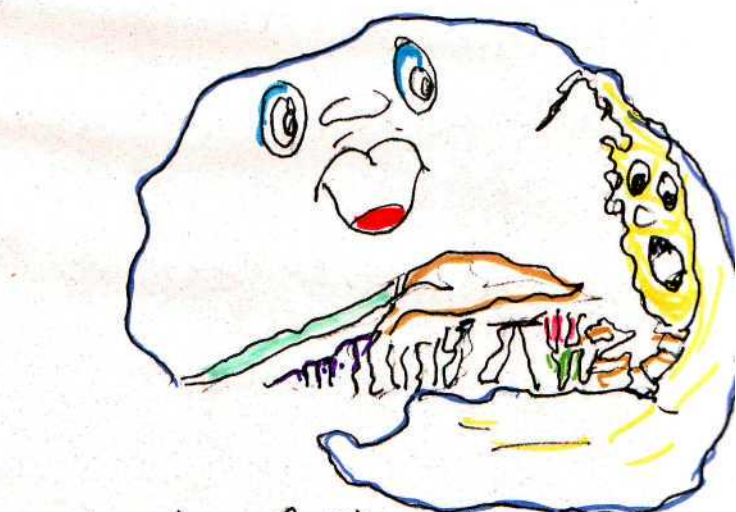
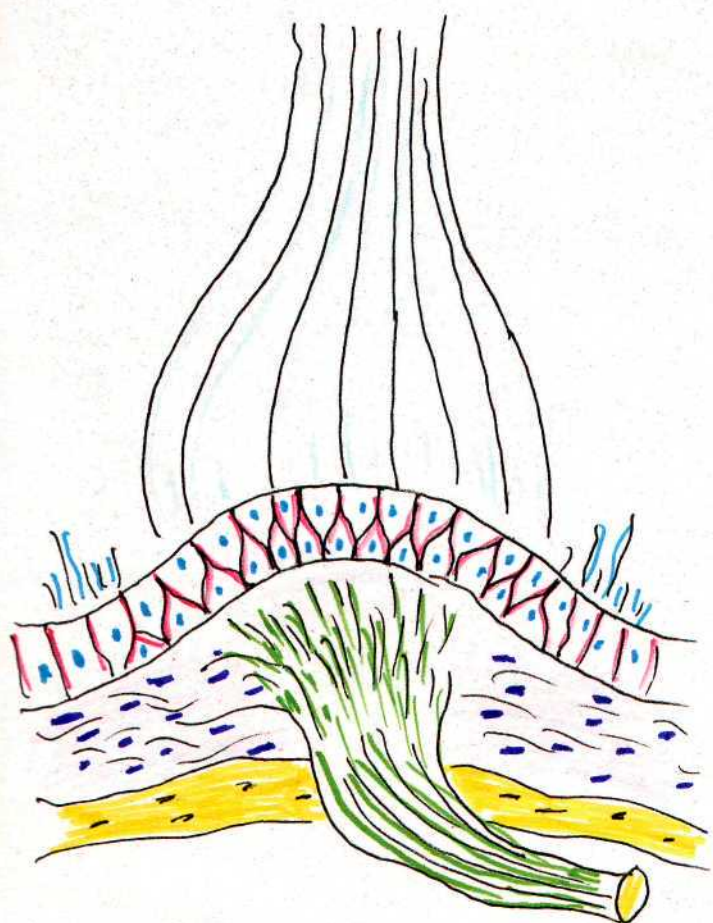
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Mixing of Perilymph and Endolymph

\downarrow
Hearing loss



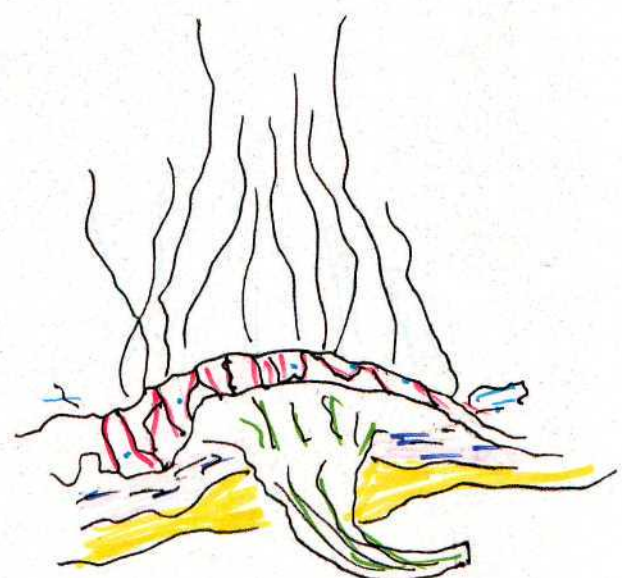


Normal Cupula & Crista



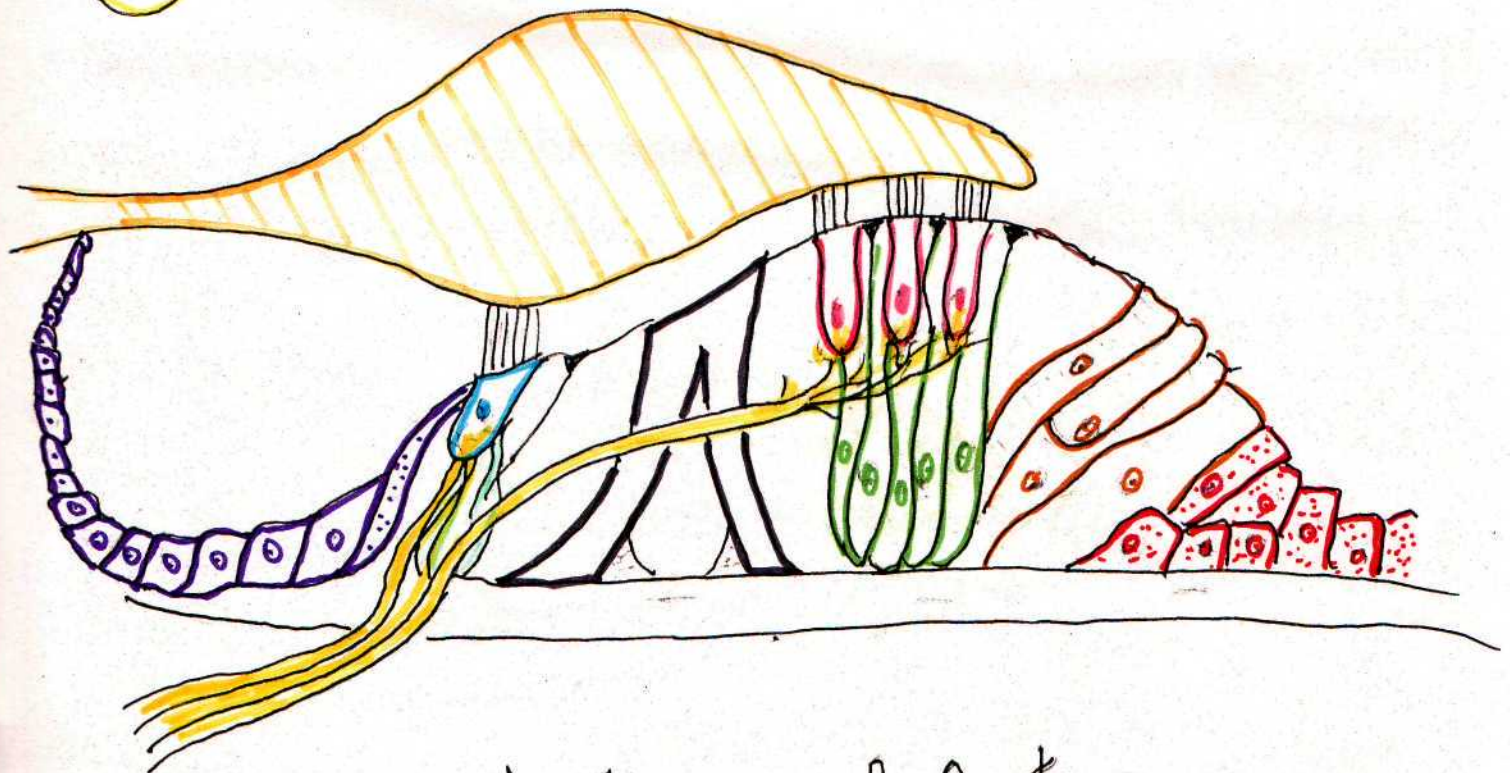
- Atrophy of Stria Vascularis;
- Collapse of Reissner's membrane which adheres to Basilar Membrane.

Pathological Cupula & Crista

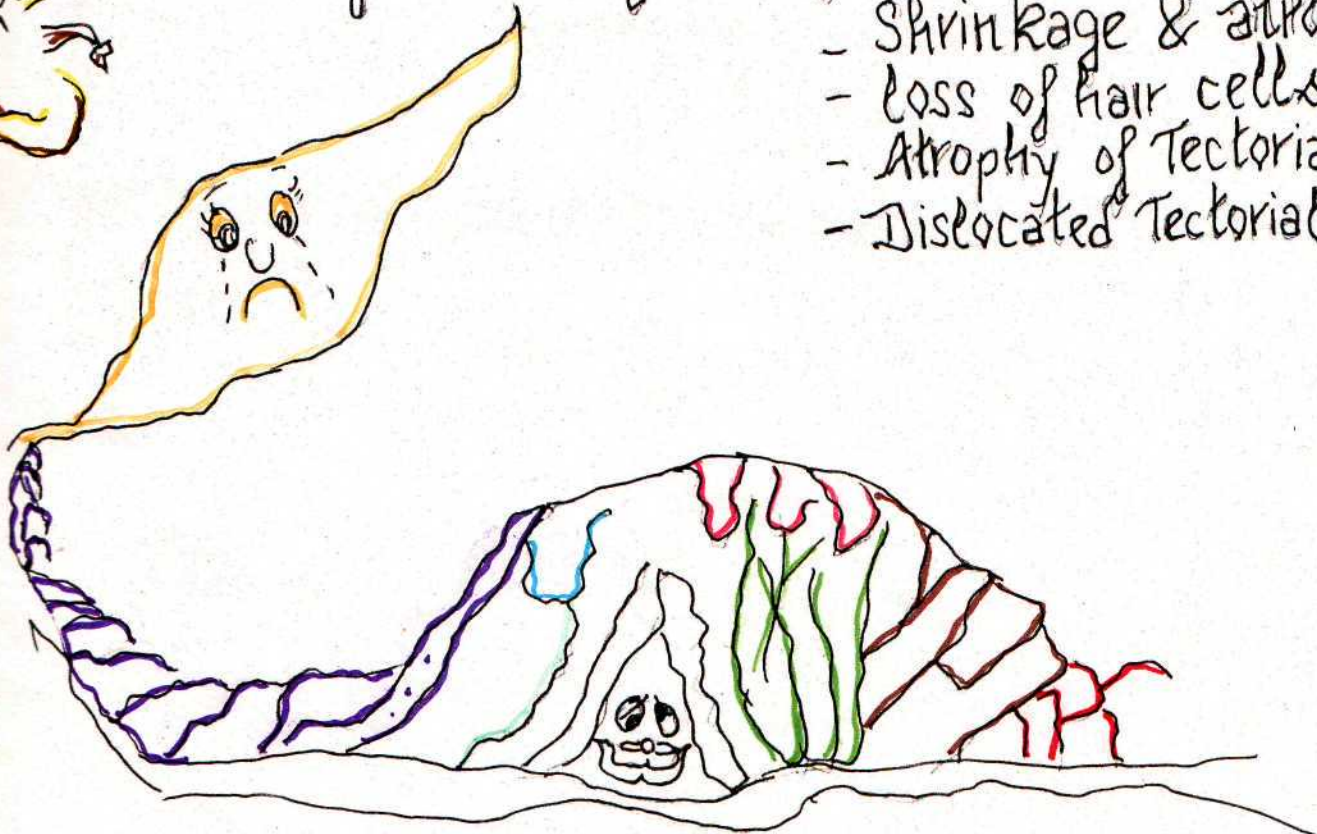


- Decrease in the number of sensory cells in ampulla, utricle and saccule;
- Total loss of these sensory cells.

Normal Organ of Corti



Pathological Organ of Corti



- Shrinkage & atrophy ;
- loss of hair cells ;
- Atrophy of Tectorial Membrane
- Dislocated Tectorial Membrane.



Any show is incomplete without a finale. The last scene is often where the climax resolves. The effort is universally to show a beginning to a seeming end! Hence after having witnessed the climax in sudden hearing loss, we have for you a glimpse of the grand finale of the show!

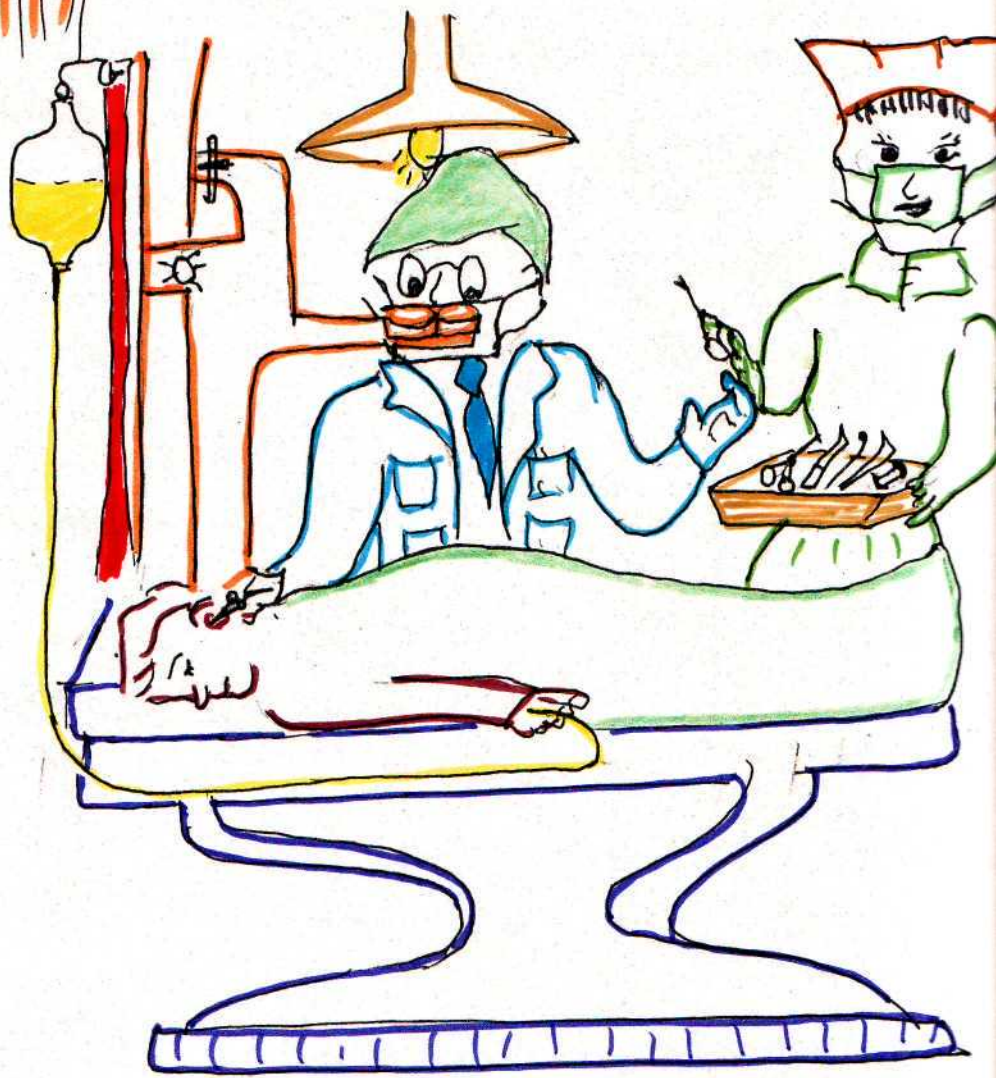


MEDICAL THERAPY

- Based on the etiology ;
- administration of :
 Vasodilators
 Anticoagulants,
 Corticosteroids,
 Sedatives & Tranquilizers,
 Vitamins
 based on the proposed etiology

SURGICAL

- In cases of Eardrum Perforation & damage to ossicles ;
- Perilymph fistula ;
- To inspect the ear structures .



REHABILITATIVE

- Provision of suitable type of hearing aid .

EPILOGUE

Hope this show has stimulated your dormant thought buds in :

- exploring this event further for the literature available knows no bounds ;
- in giving equal attention and care to the unassuming ears ; and
- warning the rest of the folks about this enigmatic event !!