



Case 2 : At the AirPort (Acoustic neuroma)



LEARNING ISSUES :

1. Mechanisms responsible for balance and hearing
2. Anatomical structures for balance system
3. anatomical structures related to the cerebellopontine angle area.
4. anatomy and function of the vestibulocochlear, trigeminal and facial nerves.
5. interpretation of symptoms, signs and investigation results of a patient presenting with acoustic neuroma.
6. Investigation needed for patient with a hearing loss.
7. Management plan and manage options.
8. impact of serious diseases on patient, family and work.



KEY INFORMATION AND PRESENTING PROBLEMS:

1. male, 55 years old
2. indian technician, works in airport
3. progressive decrease in hearing in the last 5 months
4. unsteady, surroundings are rotating
(Vertigo)
5. numbness on the right side of the face.

HISTORY :

1. Hears better on his left ear .
2. 2 months ago he went to company doctor and prescribed an ear wash because of excessive ear wax.
3. No history of trauma or chronic ear problem.
4. Few weeks ago he started to hear ringing noises in his Right ear.
5. 2-3 months ago he noticed that the surrounding are rotating (surrounding are tilting when he changes the position of his head.
6. Increasing of frequency about 6 to 7 daily
7. 3 weeks ago he noticed numbness of the right side of the face (no history of numbness or tingling anywhere else).
8. He is always fit and never hospitalized. 8. no tobacco / alcohol / medication / allergy.

CNS Examination

1 st , 2 nd , 3 rd , 4 th , 6 th , 9 th , 10 th , 11 th , 12 th cranial nerves	Normal
Gait	Normal
5 th cranial nerve (Trigeminal)	Loss of corneal reflex on the R.side , loss of sensation on the skin over the R.maxilla , normal on thr L.side
7 th cranial nerve (Facial)	Weakness on the R.side of the face, normal on the L.side
8 th cranial nerve (Vestibulocochlear)	Sensory neural hearing loss on the R.ear , normal on the L.ear

Ear
Examination

**normal external ear, no ear wax , normal tympanic •
membrane on both sides.**

Motor/sensory
testing

Normal on both sides •

Coordination
test

Normal = no cerebellar problem •

CVS + Respiratory
Examin.

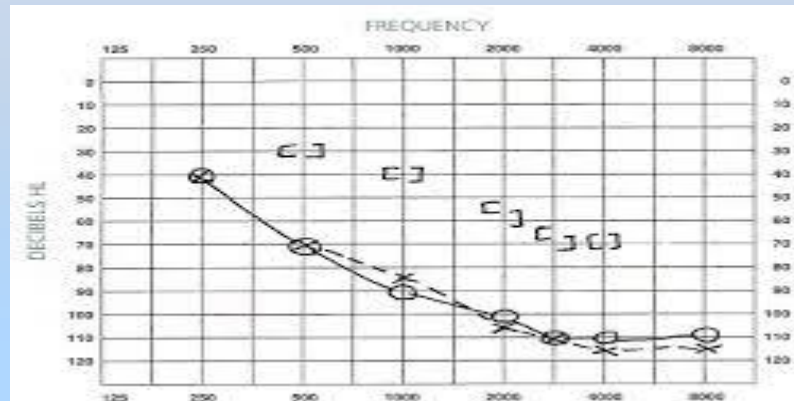
Normal •

INVESTIGATION

-Audiometry of the R.ear : evidence of high frequency of sensory neural hearing loss (bone conduction is normal) * possible diagnosis of Acoustic neuroma on the R.side *

-MRI scan of the brain with gadolinium (contrast) : shows Acoustic neuroma on the R.side of the brain.

- **What is Acoustic neuroma?**
- ✓ **Acoustic neuroma is a benign tumor on the 8th cranial nerve, and it compresses the nerves located close to 8th cranial nerve, which are 7th and 5th cranial nerves (this compression explains the face symptoms of this case)**



(an audiometry chart)

MANAGEMENT :

Either: - **Stereotactic radiation therapy** : To stop the tumour from further growth.

Or: - **Surgical intervention:** to remove the tumor

- ✓ The doctor recommended **Stereotactic radiation therapy** where we use radiation To maximize the radiation delivered to the tumor mass and at the same time minimize the exposure of normal tissue of nerves from radiation.

DIAGNOSIS :

Acoustic Neuroma (also called **Vestibular shwannoma**)

PROGNOSIS :

Mohammad successfully undergoes **stereotactic radiation therapy**, and feels much better over the next few days. * but the hearing on the R.side didn't improve. However, over the next weeks Mohammed returned to his work.

INVESTIGATIONS NEEDED FOR PATIENT WITH HEARING LOSS :

1. Audiometry (As in the case)
2. MRI (AS in the case)
3. Electrocochleography

IMPACT OF SERIOUS DISEASES ON PATIENT, FAMILY AND WORK:

According to this case:

1. Depression
2. The patient might lose his job
3. Financial problems
4. Not sure of the cause of his illness
4. Anger
5. Fear
6. Hoplessness

THE ANATOMY OF

vestibulocochlear 8th

- **Special sensory**
- **has 2 components :**
 1. **Vestibular:** associated with balance of body
 2. **Cochlear:** associated with hearing.

Revise the Anatomy lecture for more details

Acoustic neuroma: a benign tumour of 8th nerve leads to compression of the nerve leading to attacks of dizziness, and profound deafness and ataxia.

QUESTIONS

1-what is the nerve involve in the numbness of the right side of the face ?

trigeminal nerve 5th cranial nerve

2-what is the nerve involve in decreases the hearing ?

vestibulocochlear nerve 8th cranial nerve

3-list the nerves involved in mohmmad's case (not functioning properly) ?

5th , 7th and 8th cranial nerves

4-what are the relation between all nerves listed above ?

they arise near to each other (brain stem -> pon)

5-explain how unsteadiness is associated with loss of hearing? Because the tumor is arise mainly from cochlear nucleus so mohammad start to loss his hearing first , then the tumor get bigger and start to compress the anther structures like vestibular nucleus or nerve !

6-(mohammad start to hear ringing noises in his right ear) , give me a word that describe this statement ?_

Tinnitus

7-What is the significance of cerebellopontine angle area ? It is where acoustic neuromas are usually found.

And pon is connected to the cerebellum by middle cerebellar peduncles

8-What are the anatomical structure related to this area ? a structure at the margin of the cerebellum and pons

1- facial N. (CN VII) 2- vestibulocochlear (CN VIII)

9-What is the relation between each symptoms and acoustic neuromas ?

Acoustic neuroma arise near to cerebellopontine angle and compress different nerves resulting in :

1- loss of hearing – affect cochlear part of 8th nerve

2- loss of balance – affect vestibular part of 8th nerve

3- loss of sensation in face – trigeminal nerve

4- weakness in the face = facial nerve

10-what did the audiometry results show?

Bone conduction is normal ,, high frequency of sensory hearing loss of right ear.

Left ear is normal.

11-what is the possible diagnosis ?

acoustic neuroma on the right side (**schwannoma**)

12-what is the management options in this case ?

1-either surgery to remove the tumor.

2-or Stop the tumor from further growth (Stereostatic radiation therapy).

13-what is stereotactic radiation therapy?

To maximize the radiation delivered to the tumor mass and at the same time minimize the exposure of normal tissue of nerves from radiation.

14-Explain why hearing loss is never improved ?

Because the tumor arises from cochlear nerve (for hearing) and compressed the vestibular nerve.

15-Word describes (surroundings are rotating) ?

Vertigo

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Good Luck



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