

Vestibular Schwannoma in Diwaniya Teaching Hospital (Descriptive Study)

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ABSTRACT

Introduction: Unilateral vestibular schwannoma (VS) is a benign tumor arising from abnormally proliferative schwann cells, which envelope the lateral portion of the vestibular nerve in the internal acoustic meatus. The etiology of VS isn't known. The classical development of vestibular schwannomas comprises of an intracanalicular (iac) segment that later grows medially to the cisterna, trailed by cerebrium stem compression and hydrocephalus in its late stages. The typical clinical presentation of an early (iac) vestibular schwannoma consists of symptoms related to CNVIII—hearing misfortune, tinnitus, and vestibular brokenness.

Aim of study: To describe data on gender, age, tumor side and size and clinical presentation of vestibular schwannoma in al-diwanah teaching hospital

Patient and methods: This is prospective cross-sectional study consist of 22 patients (8 male, 14 female) who consulted us at own clinics and otolaryngology department in al-diwanah teaching hospital between january 2007- november 2021. All patient's complaint from unilateral tinnitus and or hearing impairment full otolaryngology examination then patients sent for audiological assessment and mri with gadolinium contrast. Patient with radiological study not goes with radiological features of vestibular schwannoma or suspected other cpa tumors are excluded from study. Speech discrimination assessment of our patients according to american academy of otolaryngology, head and neck surgery classification of hearing quality.

Results: In this study we found that male patients were 8 (36.36%) while female patients constitute 14 (63.63%) of total patients in study. Mean age was 53 years the laterality of tumor was left side 12 patients (54.54%) in, in compares to right side 10 patients (45.45%). Unilateral hearing loss and tinnitus were the most common presentations 20 patients in each one 90.9% followed by imbalance, facial numbness, headache and facial weakness

Conclusions:

1. in most cases, asymmetric sensorineural hearing impairment is the most symptom of vestibular schwannoma.
2. magnetic resonance imaging was the modality of choice for definitive diagnosis.
3. mean age at presentation was 53 years (most patients between 4th and 6th decades).
4. nearly both sides equal involved, two cases more in left side.
5. tumor size at presentation is not correlated with the speech discrimination involvement.

INTRODUCTION

"Unilateral vestibular schwannoma (VS) is a benign tumor arising from abnormally proliferative Schwann cells, which envelope the lateral portion of the vestibular nerve in the internal acoustic meatus. The etiology of VS isn't known. Late advances in atomic science demonstrate that a deformity of chromosome 22q might be liable for the improvement of both the one-sided inconsistent VS and the two-sided VS in neurofibromatosis type 2".¹ The classical development of vestibular schwannomas comprises of an intracanalicular (IAC) segment that later grows medially to the cisterna, trailed by cerebrium stem compression and hydrocephalus in its late stages.²

When growth of purely intrameatal the term intrameatal vestibular schwannoma is applied. The typical clinical presentation of an early (IAC) vestibular schwannoma consists of symptoms related to CNVIII—hearing misfortune, tinnitus, and vestibular brokenness. As the tumor develops medially, in its cisternal stage, hearing loss regularly deteriorates and vertigo advances to disequilibrium. Further development with cerebrium stem pressure is went with trigeminal indications. It is uncommon to experience a quiet with late mind stem compressive indications and hydrocephalus, albeit huge tumors were the standard in the Cushing period, alongside visual misfortune

and cerebral pains related with expanded intracranial weight (ICP).³

Historically the intervention offered was surgery the skull base multidisciplinary group is progressively offering patients the decision of medical procedure or radiotherapy, conveyed as a solitary part (Gamma Knife) or numerous parts.⁴

Aim of study: To describe Data on gender, age, tumor side and size and clinical presentation of vestibular schwannoma in al-diwanah teaching hospital

PATIENT AND METHODS

This is prospective cross-sectional study consist of 22 patients who consulted us at own clinics and otolaryngology department in al-diwanah teaching hospital between January 2007- November 2021. All patient's complaint from unilateral tinnitus and or hearing impairment full otolaryngology examination then patients sent for audiological assessment and MRI with gadolinium contrast. Patient with radiological study not goes with radiological features of vestibular schwannoma or suspected other CPA tumors are excluded from study. Our patients' speech discrimination is assessed using the American Academy of Otolaryngology, Head and Neck Surgery's hearing standard classification. as in figure 1

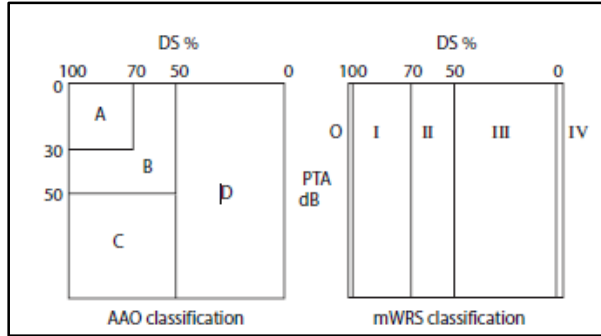


Figure 1 AAO and WRS classification of hearing quality. Tumor size assessed according to Kanzaki J et al classification ⁵ as in table 1

Table 1 classification of VS according to size

Classification	Grade	Size (mm)
Grade 0	Intrameatal	0
Grade 1	Small	1–10
Grade 2	Medium	11–20
Grade 3	Moderately large	21–30
Grade 4	Large	31–40
Grade 5	Giant	> 40

RESULTS

In this study we found that male patients were 36.36% while female patients constitute about 63.63% of total patients in study. Mean age was 53 years. The laterality of tumor was left side 12 patients (54.54%) in, in compares to right side 10 patients (45.45%). unilateral hearing loss and tinnitus were the most common presentations 20 patients in each one 90.9% followed by imbalance, Facial numbness,

Most common presentation was unilateral deafness and tinnitus as shown in table 5

Table 5 symptoms at presentation

Type of symptom	Symptoms	No.	%
Oto vestibular	Unilateral deafness	20	90.9%
	Unilateral tinnitus	20	90.9%
	imbalance	10	45.45%
Neurological	Facial numbness	4	18.18%
	headache	4	18.18%
	Facial weakness	1	4.5%
	ataxia	0	0

Hearing loss was the most common sign in those patient as shown in table 6

Table 6 signs at presentation

Sign	No.	%
Hearing loss	20	90.90%
Nystagmus	6	27.27%
Ipsilateral corneal reflex	4	18.18%
Histebirger sign	2	9.09%
Vestibular hypofunction	1	4.5%
Facial palsy	1	4.5%

Speech discrimination according to American academy of otolaryngology, head and neck surgery as in table 7

Table 7 Speech discrimination according to American academy of otolaryngology, head and neck surgery

Class	No.	%
A	4	18.18%
B	15	68.18%
C	2	9.09%
D	1	4.5%
Total	22	≈100%

Headache and Facial weakness as shown in table 5 and age distribution as in table 2

Table 2 age distribution, Sex distribution as shown in table 3 and figure two

Age/years	No	percentage
30-40	3	13.6%
41-50	4	18.18%
51-60	8	36.36%
61-70	6	27.27%
71-80	1	4.5%
Total	22	≈ 100%

Table 3 sex distribution

Gender	No.	%
Male	8	36.36%
Female	14	63.63%
Total	22	≈100%

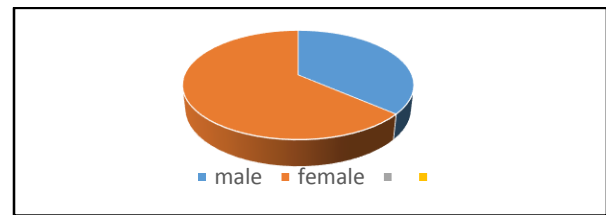


Figure 2 sex distribution. Side distribution as showed in table 4

Table 4 side distribution.

Side	No.	%
Left	12	54.54%
Right	10	45.45%
Total	22	≈ 100%

Tumor size at presentation as in table 8

Table 8 Tumor size distribution according to Kanzaki J et al classification

Class	Grade	Size(mm)	No.	%
Grade 0	Intrameatal	0	0	0
Grade 1	Small	1-10	2	9.09%
Grade 2	Medium	11-20	3	13.63%
Grade 3	Moderately large	21-30	6	27.27%
Grade 4	Large	31-40	9	40.90%
Grade 5	Giant	41-	2	9.09%
total			22	≈100%

DISCUSSION

Vestibular schwannoma by definition is a benign tumor growth of vestibular part of vestibulocochlear nerve and it's regarded as the most common pathology in cerebellopontine angle in 90% of cases in this region. Other 10% may include meningiomas, epidermoid, facial schwannomas, and other rarer lesions.⁶

Most patients age at presentation was between 40-70 which is agree with Stangerup SE, et al⁷ And Selesnick SH, Jackler RK.⁸ Regarding laterality our study tumor was left side 12 patients (54.54%) in, in compares to right side¹⁰ patients (45.45%) which is agree with most international literatures as Ricardo⁹, Woellner RC et al Woellner¹⁰ and Sandifort E.¹¹ unilateral hearing loss and tinnitus were the most common presentations 20 patients in each one 90.9% which agree with Frohlich AM, Sutherland GR,¹² Tos M, et al¹³ and House WF¹⁴ followed by Imbalance, Facial numbness, Headache and Facial weakness Hearing loss. While in regarding signs at presentation were Nystagmus Ipsilateral corneal reflex Histelbirger sign Vestibular hypofunction Facial palsy in order sequences as showed in table 6. Due to the best delineation and soft tissue contrast of Magnetic resonance imaging (MRI) so is still the imaging of choice in the diagnosis of cerebellopontine angle tumors. Round, ovoid, or lobulated tumours are the most common. The angle developed between the tumour and the petrous bone is typically acute if it extends into the cerebellopontine cistern. Vestibular schwannomas on MRI are typically T1 isointense or hypointense to adjacent brain tissue and homogeneous contrast enhancement with gadolinium. cystic changes may lead to heterogenous gadolinium enhancement. while its appearance is hyperintense and heterogenous in T2 imaging. while in case of bleeding that occur inside tumor may result in T1 hyperintensity and susceptibility on T2 imaging.¹⁵

Regarding speech assessment and discrimination, Stangerup et al. observations in 33-year period that speech discrimination in 59% of the patients were better than 70%, good level of hearing preservation after a mean of 4.7 years of follow-up. speech discrimination score of 100% at diagnosis in about 69% of patients preserved good hearing in 10 years of follow up years. Of the patients who reveal small loss of discrimination at diagnosis, 38% maintained good hearing. unfortunately, because of poor compliance of our patients and shorter duration of study in comparing with stangerup et al.¹⁶ study we can't assess this parameter.

CONCLUSIONS

- 1) The most prominent symptom of vestibular schwannoma is asymmetric sensorineural hearing loss.

- 2) For a conclusive diagnosis, magnetic resonance imaging was the method of choice.
- 3) Mean age at presentation was 53 years (most patients between 4th and 6th decades).
- 4) Nearly both sides equal involved, two cases more in left side.
- 5) Tumor size at presentation is not correlated with the speech discrimination involvement.

REFERENCES

1. Mirko Tost, Sven-Eric Stangerup and Per Caye-Thomasen, Scott-Brown's Otorhinolaryngology Head and Neck Surgery volume 2 section 3 ch101 p1229 eight edition.
2. Jackler RK, Brackmann DE. Neurotology, 2nd edition. Philadelphia, PA: Mosby; 2005. xxiii, 1411p.
3. Sean McMenomey, Maja Svrakic SATALOFF'S COMPREHENSIVE TEXTBOOK OF OTOLARYNGOLOGY HEAD AND NECK SURGERY vol1 Ch. 23 p361 First Edition: 2016.
4. Fayad JN, Semaan MT, Lin J, et al. Conservative management of vestibular schwannoma: expectations based on the length of the observation period. Otol Neurotol 2014; 35(7): 1258–65.
5. Kanzaki J, Tos M, Sanna M, et al. New and modified reporting systems from the consensus meeting on systems for reporting results in vestibular schwannoma. Otol Neurotol 2003; 24(4): 642–8.
6. Adam A Master, Maura K Cosetti, SATALOFF'S COMPREHENSIVE TEXTBOOK OF OTOLARYNGOLOGY HEAD AND NECK SURGERY vol1 ch 24 p 419 1st edition 2016
7. . True incidence of vestibular schwannoma? Neurosurgery. 2010;67(5):1335-40; discussion 1340.
8. Selesnick SH, Jackler RK. Atypical hearing loss in acoustic neuroma patients. Laryngoscope. 1993;103(4 Pt 1):437-41.
9. Bento RF, Miniti A, Marone SAM. Tratado de Otologia. São Paulo, EDUSP, 1998. Ferreira Bento et al ,
10. Woellner RC et al Woellner RC, Schuknecht HF. Hearing loss from lesions of the cochlear nerve: an experimental and clinical study. Trans Am Acad Ophthalmol Otolaryngol. 1955;59 (2):147- 9.
11. Sandifort E. Observationes anatomicae-pathologicae, vd Eryck P, Vygh D, Lugduni Batavorum 1777.
12. Epidemiology and clinical features of vestibular schwannoma in Manitoba, Canada Can J Neurol Sci. 1993;20(2):126-30., Howitz MF, et al. Incidence of vestibular schwannoma in Denmark, 1977-1995. Am J Otol. 2000;21(5):690-4.
13. . What is the real incidence of vestibular schwannoma? Arch Otolaryngol Head Neck Surg. 2004;130(2):216-20.
14. House WF. The acoustic neuroma saga. J Laryngol Otol. 1995;109(5):367-8.
15. Mulkens T, Parizel P, Martin J, et al. Acoustic schwannoma: MR findings in 84 tumors. AJR Am J Roentgenol. 1993;160(2):395-398.
16. S.-E. Stangerup and P. Caye-Thomasen, "Epidemiology and natural history of vestibular schwannomas," Otolaryngologic Clinics of North America, vol. 45, no. 2, pp. 257–268, 2012.