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Acoustic Neuromas : The Anatomic, Histopathological and Radiological Perspective

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Abstract: Acoustic Neuromas are usually benign, rather rare tumors. They are usually confined to the Eighth nerve and called vestibular schwanomas. The article presents the Anatomic, Histopathological and radiological perspective of the benign lesion.
Keywords: Neuroma, Benign, Mediastinum, Schwannoma, Vestibular.

INTRODUCTION

Acoustic neuromas are relatively uncommon tumors usually found along the course of the eighth cranial nerve particularly in relation to cerebellopontine angle. The incidence of acoustic neuromas is rising and is associated with increased use of mobile phones. They are usually benign, but their anatomic location is getting diversified as many cases are being located in different regions. These tumors have been found in middle cranial fossa, posterior cranial fossa, mediastinum as well as thoracic cavities. Hence there is a need for proper assessment of any mass in these anatomic locations for a diagnosis of Acoustic Neuroma.

CASE REPORT & DISCUSSION

In the Kashmir Valley twenty cases of Acoustic neuromas have been detected till 2012 from two major hospitals and most of the patients presented with difficulty in hearing and tinnitus. Hearing loss, Tinnitus, Headache and vertigo were the chief complaints. Most of the cases were males (17 cases).

Acoustic Neuromas represent less than 10% of primary intracranial tumors. They are usually located in relation to cerebellopontine angle but bilateral vestibular schwanommas are seen in Neurofibromatosis. Their incidence seems to be rising partly due to newer diagnostic techniques of CT and MRI Scans

A True acoustic neuroma is strictly a benign tumor involving cells of the myelin sheath that surrounds the eighth cranial nerve. Acoustic neuromas are often called vestibular schwannomas because usually they are tumors that arise from the Schwann cells of the myelin sheath that surrounds the vestibular nerve. Acoustic neuromas are considered benign tumors since they do not spread to other parts of the body.

Upon Histological examination, the acoustic neurinoma presents two distinctive architectural patterns, designated Antoni A and Antoni B [1, 2]. Both are created by spindle cells with elongated nuclei and fibrillated cytoplasm [3], predominantly those of Schwann cells. The two tissue patterns differ in cellular weave and density.

Antoni A tissue is compact, with a prominence of interwoven fascicles. Antoni B tissue is porous and less structured. The cells are dispersed randomly about blood vessels, microcysts, collections of xanthomatous cells and sites of previous hemorrhage. Lymphocytes attest to antecedent degenerative events within Antoni B tissue [4]. The degree of nuclear pleomorphism varies considerably among acoustic neurinomas as well as between different areas within the same tumor [5]. This pleomorphism often contributes a random population of large,bizarre nuclei that taunt the pathologist with thoughts of anaplasia: however, fortunately, malignant transformation is of a rarity that permits individual case

reports. Mitotic figures are most infrequent. Necrosis is commonly present but most often testifies to the meagerness of native blood vessels and their compression by tumor expansion within a restricted compartment. This is a result of origin from transistion point between Schwann cells and glial cells called as Obersteiner Redlich zone [6].

Radiologically the Acoustic Neuromas are well demonstrated by CT , MRI. Ct may demonstrate widening or so metimes erosion of the internal auditory canal with variable density. They may be confined to labrynth or may grow laterally [7]. Extracanalicular extension is commonest via path of least resistance towards Cerebellopontine angle leading to an ice cone appearance.

MRI may demonstrate hypointense lesions or rarely cystic lesions [8] at Cerebello pontine angle. Abberant course of facial nerve or Internal carotid artery or high riding Jugular bulb can pose a problem during surgery and should be well defined by Imaging techniques.

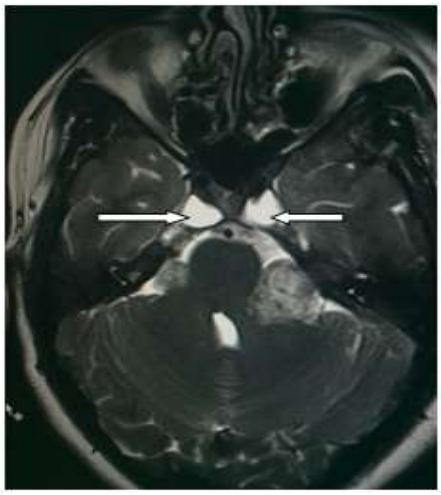

Fig. 1: Bilateral Acoustic Neuromas

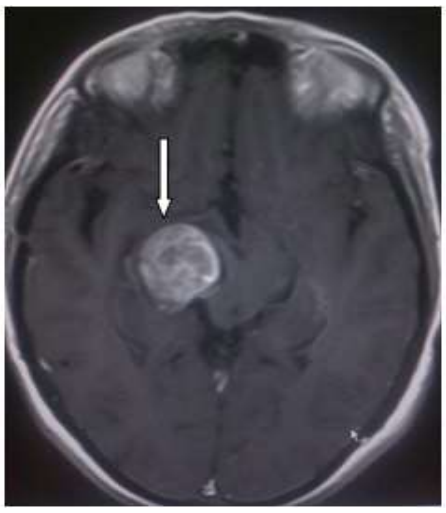

Fig. 2: A Solitary Acoustic Neuroma

Fig. 3: A Rare Site of Acoustic Neuroma near Foramen Magnum Compressing Brain Stem

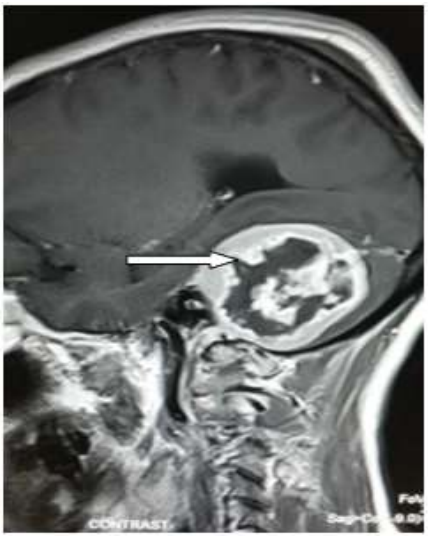

Fig. 4: A cystic component of Acoustic Neuroma

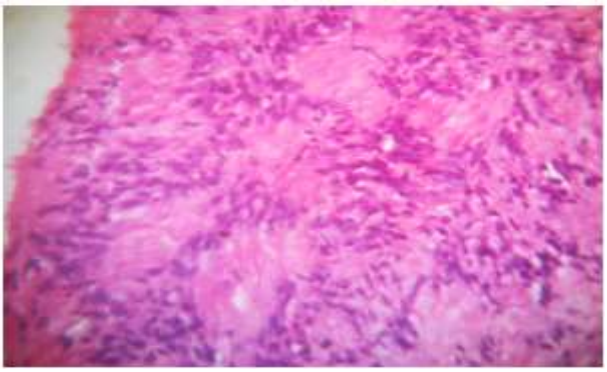

Fig. 5: Slide showing histopathology of Acoustic Neuroma

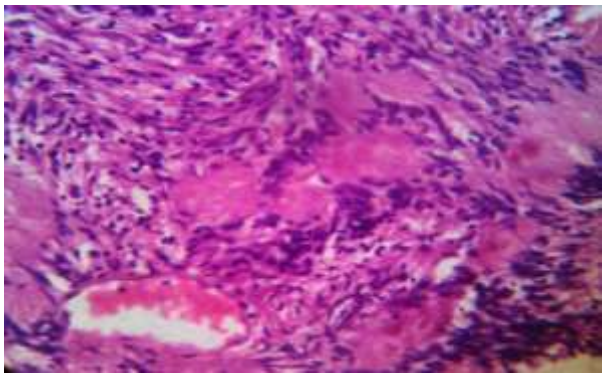

Fig. 6: High Magnification Slide showing histopathology of Acoustic Neuroma

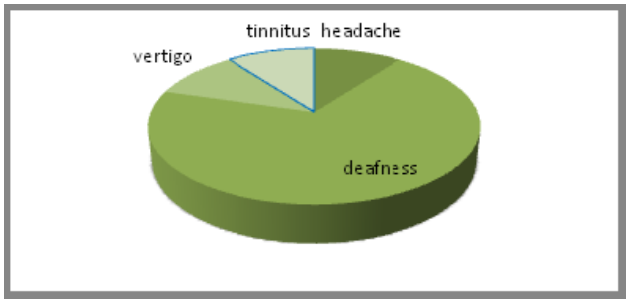

Fig. 7: Patient Symptomatology chart

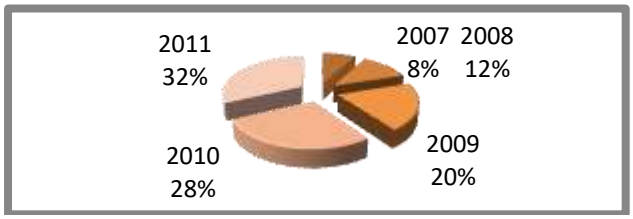

Fig. 8: Year Wise Data (2007-2011)

CONCLUSION

With the rising incidence of Acoustic neuromas due to their increased rates of detection and associated with increased use of mobile telephones with the added fact that these masses can present at many anatomic sites, Acoustic neuroma should not be forgotten.

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