Available online at www.elixirpublishers.com (Elixir International Journal)

Radiology

Elixir Radiology 169 (2022) 56400 -56402

ISSN: 2229-712X

Acoustic Neuroma: Appearance of Ice-Cream Cone on MRI

Chirihan. Ayadi*, Ibtissame. Elouali, Safae. Lanjeri, Laila Jroundi and Fatima Zahra. Laamrani
Departement of Radiology, Hospital Ibn Sina, University Mohamed V, Rabat, Morocco.

ARTICLE INFO

Article history:
Received: 11 June 2022;
Received in revised form:
7 August 2022;
Accepted: 19 August 2022;

Keywords
Acoustic Neuroma,
Vestibular Schwannoma,
Ice Cream Cone,
Magnetic Resonance Imaging.

ABSTRACT

Acoustic neuromas represent 6-7% of all intracranial tumors and develop slowly in the internal auditory canal, in the cerebellopontine angle. It is usually unilateral. The bilateral forms are exceptional and suggest neurofibromatosis type 2 "NF2". It can cause neurological disorders because of its development but also because of its volume and the compression caused on adjacent neurological structures. Magnetic resonance imaging (MRI) is the standard imaging modality for the diagnosis of the disease. which shows a mass of the cerebellopontine angle of intermediate signal in the T2-weighted sequence, heterogeneous, strongly enhanced after injection, with the famous sign of the ice cream cone aspect testifying to damage of the VIII nerve in the internal auditory canal, these tumors are classified according to their extent and size, which conditions the therapeutic management, the treatment is based on microsurgery, radiosurgery or therapeutic abstinence, depending on the tumor stage.

Introduction

Neuroma is a benign tumor of the nerve sheath that consists of spindle cells in a compact or loose organization. This tumor can develop along the nerve sheath of any peripheral or cranial nerve, with a variable prevalence. The nerve most frequently affected is the vestibulocochlear nerve (VIII) in about 90%, [1].

Observation

A 45 year-old-woman, without pathological history, who presents since one year a progressive and unilateral audition loss on the left side complicated by the appearance of balance dysfunction, cerebral MRI has been performed showing an intracranial extraaxial well-limited process of the left cerebellopontine angle, with intra- and extra-meatic location, enlarging the internal auditory canal, and mimicking the appearance of an ice cream cone, measuring 5 cm in long axis, in T1 isosignal, with intermediate signal T2, and diffusion restriction, strongly enhanced after injection, pushing the brain stem and V4 and arrives at the contact of the ICA (Figure 1)

Discussion

The acoustic neuroma is an extraaxial tumor, which develops from Schwann cells of the vestibulocochlear nerve. It has a very slow growth. its development in a closed and rigid environment is responsible for a compression of the auditory nerve fibers. If the tumor continues to grow, imbalances will be observed.

Unilateral and asymmetric hearing loss, tinnitus, loss of balance, or vertigo are the first signs of acoustic neuroma. However, early detection of the tumor can be difficult because small tumors are asymptomatic and symptoms may appear in the later stages of growth [2].

The radiological appearance of acoustic neuroma is characteristic of MRI. It appears as a heterogeneous hypersignal lesion in the T2-weighted sequence due to its mixed composition of compact cells (Antoni type A) and loose cells (Antoni type B) [3]. The T1-weighted sequence shows a weak or intermediate signal, with significant enhancement after injection of contrast agent, responsible for deformation of adjacent brain tissue and displacement vessels without narrowing or occlusion (table) [4]

Tumor size and expansion play a crucial role in terms of staging. Several authors have correlated these two criteria with different surgical approaches. Samii's classification, which like Koos's [7], mainly differentiates 4 tumor stages (Figure 2).

The presence of bilateral vestibular schwannomas indicates the presence of neurofibromatosis type 2 (NF2) [5]

Treatment of vestibular neuromas is based on 3 pillars which are microsurgery and/or stereotactic radiosurgery, depending on the stage of evolution, sometimes therapeutic abstention and monitoring in the case of small asymptomatic and non-evolving tumor [6].

Conclusion

Acoustic neuroma is a rare extraaxial benign intracranial tumor originating from the VIIIth cranial nerve, slowly evolving and often diagnosed late, MRI is the reference imaging in diagnosis with a pathognomonic sign "ice cream cone", its therapeutic management is variable from case to case.

Tele:
E-mail address: chirihane.ayadi@gmail.com

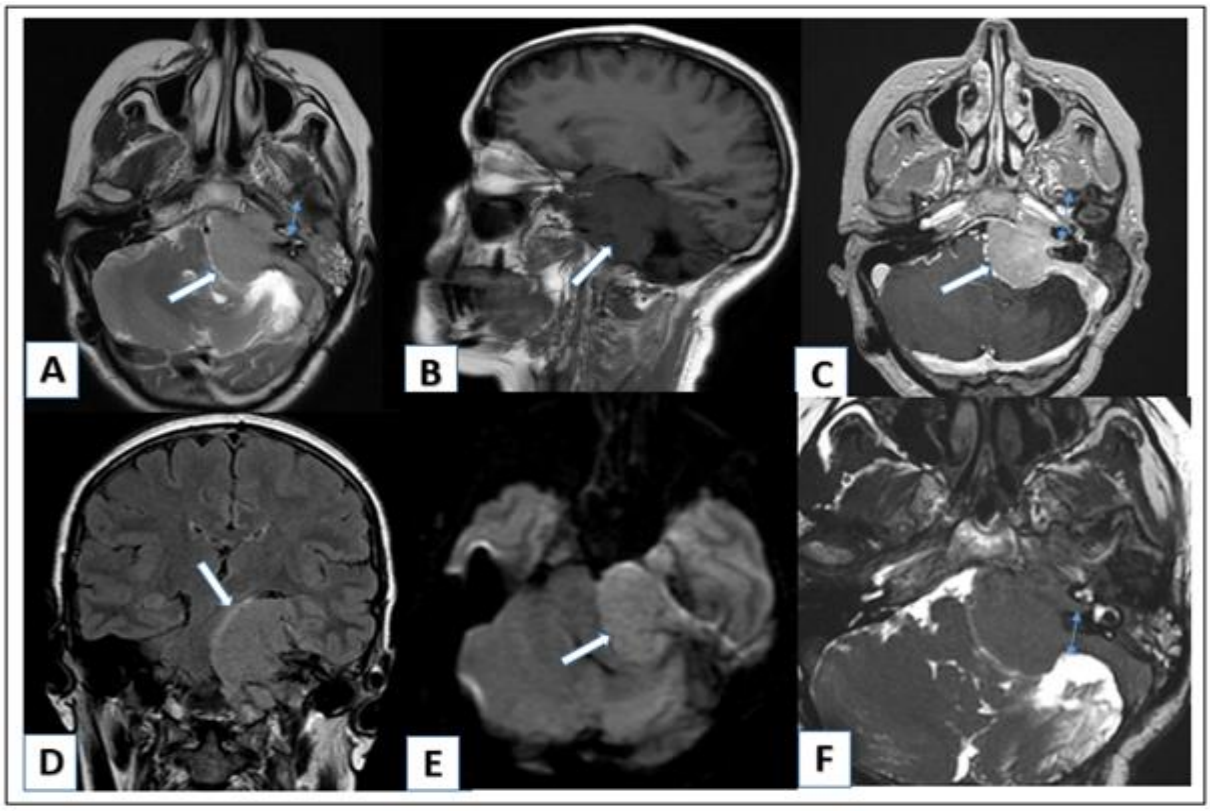

Figure 1 . Magnetic resonance imaging appearance of an acoustic neuroma in the internal auditory canal (IAC) of the cerebellopontine angle (CPA). (A) The axial T2-weighted MR image shows the intermediate signal intensity of the mass (white arrow). (B) The sagittal T1-weighted MR image shows hyposignal and (C) contrast uptake shows a significant enhancement of the mass, (D) The oronal Flair MR image shows a mass effect on the cerebellum and trunk with low peri-tumor edema, considering the size of the mass (E) with light diffusion restriction. (F) Fiesta axial image shows enlargement of the porus acusticus internus by the mass, realizing the appearance of ice-cream cone (blue arrow) and extending to the cochlea and vestibule.

Imaging or Clinical Finding Category*	Imaging Feature
Nonenhanced T1-weighted MR imaging	Low to intermediate signal intensity
Contrast-enhanced T1-weighted MR imaging	Avid enhancement with or without nonenhancing cystic spaces
T2-weighted MR imaging	Heterogeneous high signal intensity
Nonenhanced CT	Low to intermediate attenuation
Contrast-enhanced CT	Variable enhancement
Slow growth pattern	Deformation of adjacent brain tissue, with disproportionately small amount of edema, given lesion size Smooth expansion of neural foramina Displacement of adjacent vessels without narrowing or occlusion

Table . Imaging features of acoustic neuroma (vestibular schwannoma)

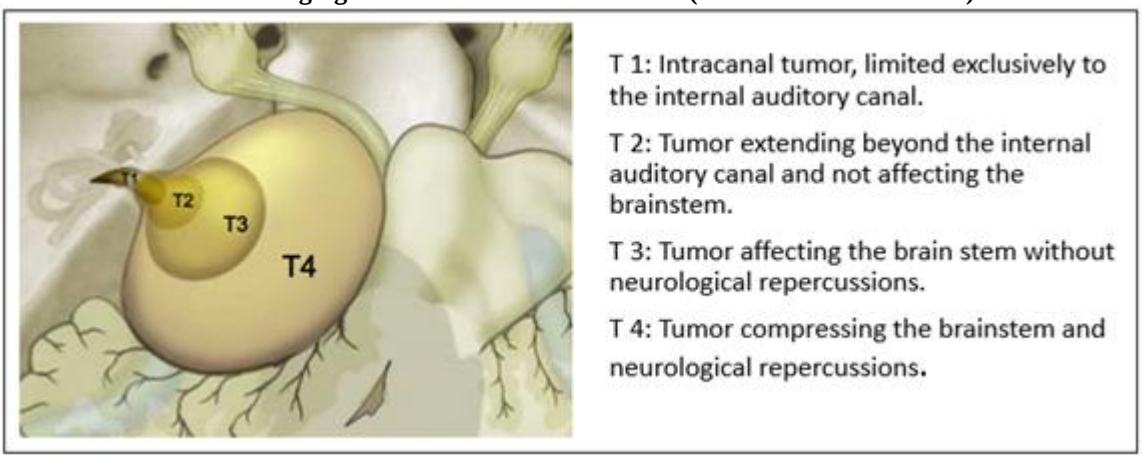

Figure 2 . Tumor stages according to Koos [7]

References

1- Sarma S, Sekhar LN, Schessel DA. Nonvestibular schwan- nomas of the brain: a 7-year experience. Neurosurgery 2002;50(3):437–448; discussion 438–439.

2- estibular Schwannoma (Acoustic Neuroma) and Neurofibromatosis NIH Pub. No. 99-580 November 2015

3- Koga H, Matsumoto S, Manabe J, Tanizawa T, Kawaguchi N. Definition of the target sign and its use for the diag- nosis of schwannomas. Clin Orthop Relat Res 2007;464: 224–229.

4- Thamburaj K, Radhakrishnan VV, Thomas B, Nair S, Menon G. Intratumoral microhemorrhages on T2*- weighted gradient-echo imaging helps differentiate vestibular schwannoma from meningioma. AJNR Am J Neuroradiol 2008;29(3):552–557.

5- Aser ME, Friedman JM, Joe H, Shenton A, Wallace AJ, Ramsden RT, Evans DG. Empirical development of improved diagnostic criteria for neurofibromatosis 2. Genet Med. 2011 Jun;13(6):576- 81. DOI: 10.1097/GIM.0b013e318211faa9

6- Steffen Rosahl , Christophe Bohr , Michaël Lell , Klaus Hamm , Heinrich Iro . Diagnosis and treatment of vestibular schwannomas - an interdisciplinary challenge. 10.3205/cto000142

7- Koos WT, Spetzler RF, Böck FW, Salah S. Microsurgery of cerebellopontine angle tumors. In: Koos WT, Böck FW, Spetzler RF, eds. Clinical Microneurosurgery. Stuttgart: Thieme; 1976. p. 91-112.