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MRI and CT of Anterior clinoid process pneumatisation causing ipsilateral fourth cranial nerve palsy

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ABSTRACT We present a case report of a patient who presented with history of diplopia since two years and head tilt towards right side. After clinician's assessment patient was send to our department for MRI brain scan to find out cause of Right fourth cranial nerve. Over- pneumatised Right sided anterior clinoid process appears hypointense on all pulse sequences impinging upon rt.superior orbital fissure and may mimic the flow void of an aneurysm. However CT scan was done and it was confirmed that over-pneumatised anterior clinoid process impinging the superior orbital fissure causing fourth nerve palsy. We concluded that though rare asymmetrical aneurysm should be included in differential diagnosis of fourth nerve palsy.

KEYWORDS : Anterior clinoid process,pneumatisation

Introduction

Pneumatisation of anterior clinoid process presenting as fourth nerve palsy is rare manifestation. Asymmetrically pneumatized anterior clinoid process may present a diagnostic challenge when seen on MRI and may be misinterpreted as an aneurysm or a mass[8].MRI sequences include T1W,T2w,Gradient and post contrast images in all of which it appear as hpointense structure impinging on superior orbital fissure without post-contrast enhancement. However it is usually confirmed on plain CT scan which show over pnumatised anterior clinoid process causing narrowing of superior orbital fissure[1,2].

Case Report

A 52 year old male presented to the neurology OPD with chief complaints of diplopia and right sided tilt of head. After clinical assessment the patient was referred to our department for MRI brain and find out cause of fourth nerve palsy. We did routine scan in GE 1.5 Tesla MRI machine which included T1W, T2W, FLAIR, DWI, FIESTA, GRADIENT and T1W post contrast sequences. The right fourth nerve was found normal in its origin at dorso-lateral aspect of mid-brain and its intra-cranial course. However there was an area in right superior-medial aspect of superior orbital fissure appearing hypo-intense on all pulse sequences[5,6,7]. It was impinging upon the SOF and causing its narrowing, no post-contrast enhancement was seen. NCCT brain was done and the over-pneumatisation of anterior clinoid process on right side was more clearly delineated.

Discussion

This case represent rare occurrence of over pneumatisation of anterior clinoid process causing narrowing of superior orbital fissure and presenting as ipsi-lateral fourth nerve palsy.The floor and roof of the orbital apex are formed by the greater and lesser wings of the sphenoid bone. When these bone structures become pneumatized in the course of normal development,they may attain over pneumatisation though rarely[8]. Over pneumatisation of anterior clinoid process causing narrowing of superior orbital fissure and presenting as ipsi-lateral fourth nerve palsy is rare occurrence [1]. The patient's presents with vertical diplopia and head tilt towards the side of the lieson. The long course of the trochlear nerve makes it especially susceptible to injury in association with head trauma. The countercoup forces compresses the nerve against the rigid tentorium which lies adjacent to the nerve for much of its course. But the history of trauma was not present in our case.

An over-pneumatised anterior clinoid process is chronic, expansile process that is completely filled with air and lined by respiratory epithelium.Patients may present orbital headache, referral pain in the cranial nerve territory of II to IV nerves or their palsy[2,4].

The MR signal characteristics of over pneumatised anterior clinoid process and it appear hypointense all pulse sequences. Asymmetrically pneumatized anterior clinoid process may present a diagnostic challenge when seen on MRI and may be misinterpreted as a thrombosed aneurysm or a mass. It is easy to characterize on CT as in our case which made over-pneumatised anterior clinoid process more conspicuous. Asymmetrically under pneumatized anterior clinoid process contains normal marrow and surrounding cortical bone, and appears as high T1 iso-T2, non-enhancing structure[3]. Completely pneumatized anterior clinoid process appears hypointense on all pulse sequences and may mimic the flow void of an aneurysm.

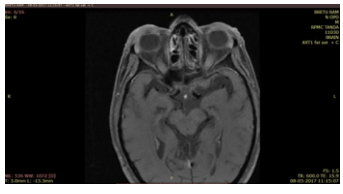
Conclusion

The bones forming the anterior clinoid process and orbital apex are often aerated. These may in turn become over-expanded and causing mass effect on surrounding structures.It is important to understand these developmental variants, particularly if a mass is detected in these positions. In a patient with signs and symptoms referable to the orbital apex.

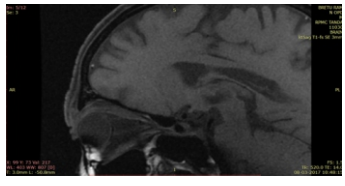
Acknowledgements

We are grateful to almighty for his blessings.

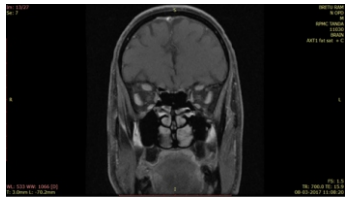
A)



B)



C)

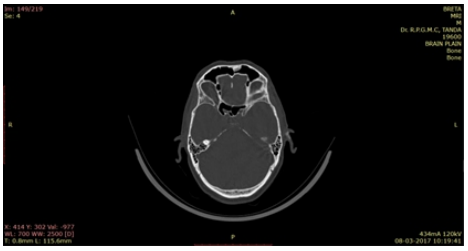


Case : 61-year-old man with fourth cranial nerve palsy as well as headache

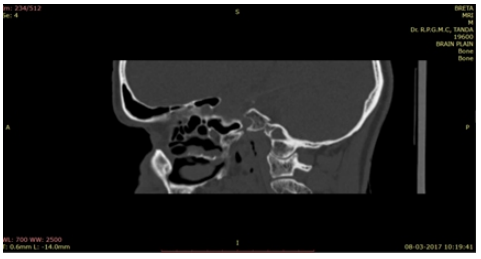
*A,*Axial contrast enhanced T1-weighted with fat saturation image shows a lesion of low signal intensity involving right anterior clinoid process causing its expansion

B,C saggital and coronal contrast enhanced T1-weighted with fat saturation image also shows a lesion of low signal intensity involving right anterior clinoid process causing its expansion.

D)



E)



F)

NCCT of same patient

A,B,andC,Axial,saggital and coronal NCCT scan showing pneumatised and expande right anterior clinoid process.

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