



Clinical History:

A 70 years old male presented with history of progressive forgetfulness since past few months. H/o involuntary movements of the head and upper extremities was noted.

No h/o weakness.

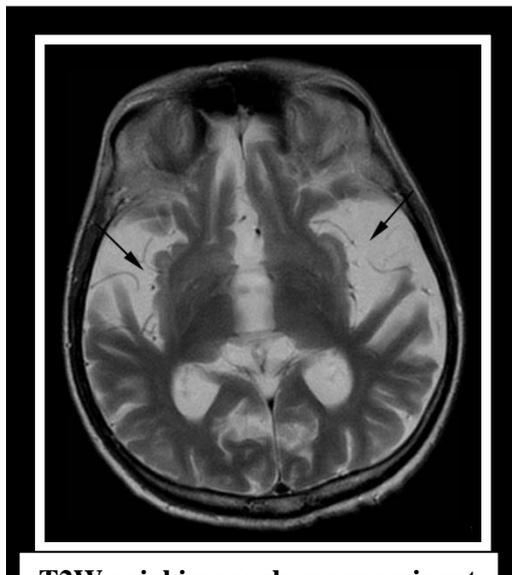
No h/o past vascular insult/stroke.

On examination no focal neurological deficit seen.

Imaging Findings:

Patient referred for Plain MR imaging with clinical diagnosis of

Parkinsonism / Lewy-body disease/ Alzheimer's disease.



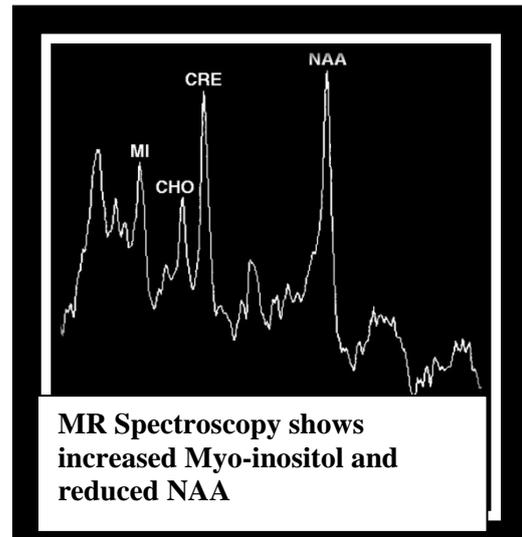
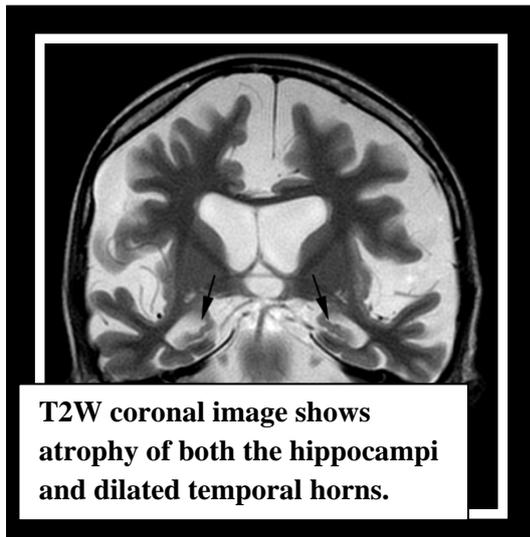
T2W axial image shows prominent sylvian fissures



T2W coronal image shows volume loss in both temporal lobes

Plain MRI findings revealed:

- Severe grey matter atrophy involving both the cerebral hemispheres, with predominant volume loss in both temporal lobes. Atrophy of hippocampal formations also noted.
- The subarachnoid spaces were prominent with dilated ventricular system particularly the temporal horns. The sylvian fissures appeared markedly widened.
- The brainstem appears normal. Pars compacta shows normal thickness on both sides.
- No focal white matter abnormality detected.
- **Multivoxel Spectroscopy** revealed increase in the Myo-inositol metabolite levels and reduced NAA levels.



Final Diagnosis: Alzheimer’s Disease.

Discussion:

Presentation:

AD is a progressive degenerative disorder of insidious onset, characterised by memory loss, confusion and a variety of cognitive disabilities.

It may occur as early as the at age of 40 years , but is most commonly seen after the age of 60 years. In its early stages in elderly persons , the symptoms are difficult to distinguish from those of normal ageing. In later stages AD may be mistaken for other kinds of dementias and mental diseases.

The cause is unknown, however in some cases it seems to have a familial incidence indicating a strong genetic component.

Diagnosis:

The diagnosis of this disease can be made with high accuracy by using clinical, neuropsychologic and imaging assessments.

MRI scores over CT for the routine evaluation of AD because of its application in multiplanar imaging and better delineation of grey and white matter. Coronal MR images are useful to document or quantify atrophy of the hippocampus and medial temporal lobes ,both of which occur early in the disease process.

On MRI Alzheimers patients show generalised cortical atrophy and grey matter reduction with disproportionate volume loss in the anterior temporal lobes and hippocampi (Hallmark Feature).



The temporal horns as well as the choroid and hippocampal fissures appear particularly prominent. Enlarged sylvian fissure are sensitive but less specific.

MRI Spectroscopy is a technique that can monitor brain metabolites. In Alzheimers the presence of senile plaques is associated with neuronal loss that is reflected as decrease in the N-Acetyl Aspartate. Additional finding is increase in the metabolite Myo-Inositol which is a metabolite that is produced by the astrocytes surrounding the senile plaques.

D/D:

- Age related atrophic changes.
- **Lewy- body disease**-A variant of AD with prominent Parkinsonian features and accentuated frontal lobe atrophy.
- Other Cortical Dementias:
Pick Disease: The frontal and temporal lobes are commonly and disproportionately affected whereas parietal and occipital lobes are relatively spared.
Vascular Dementia: H/o of multiple cerebral infarcts noted that is reflected on imaging studies.
- **Parkinsonism /Parinsonism related disease:** MR Imaging studies show decrease in width of the pars compacta. Also noted are large supratentorial sulci and prominent posterior fossa subarachnoid cisterns.

Message:

- 1. Imaging is indicated as an adjunct to help assess the degree of atrophy and to rule out other causes of dementia (tumours/vascular dementia/NPH).**
- 2. MRI is the imaging modality preferred over CT in cases of neuro-degenerative diseases such as Alzheimers.**
- 3. MR Spectroscopy by virtue of its ability to detect the brain metabolites plays an valuable role in the diagnosis of Alzheimers.**
- 4. PET and Functional MRI are coupled with more sensitive volumetric techniques for assessment of AD.**

Regards,

Dr.Deepa S.Nadkarni / Dr.Shaikh M.Mazhar

N.B: This case is authentic and from the archives of Radiance Diagnostics. For any queries / suggestions/feedback write to us at radiance@radiancediagnostics.in