Seizures

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Mesial Temporal (Hippocampal) Sclerosis (& temporal lobe encephalomalacia)
Hippocampal Atrophy (yellow arrow)
Temporal lobe encephalomalacia (orange arrows)
Hippocampal Atrophy with increased T2 signal (yellow arrow)
Temporal lobe encephalomalacia (orange arrow)

T2-weighted MRI image, coronal
Hippocampal sclerosis with increased T2 signal and loss of gray-white tissue contrast of the left hippocampus (yellow arrow) as opposed to right hippocampus where gray-white lamina are preserved (orange arrow)
Mesial Temporal Sclerosis

• Presentation:
  – Intractable temporal lobe epilepsy.

• Etiology:
  – Does mesial temporal sclerosis cause temporal lobe epilepsy or vice versa?
  – Theory that hippocampal sclerosis is both cause & result of Sz, being damaged by Sz (excitotoxic) & becomes an amplifier, eventually the cause of seizures
Mesial Temporal Sclerosis

- MRI (modality of choice):
  - Dedicated temporal lobe epilepsy protocol needs to be performed to achieve good sensitivity & specificity.
  - Thin section coronals preferably angled perpendicular to the hippocampal long axis to minimize volume averaging.

- MRI Findings:
  - Reduced hippocampal volume; hippocampal atrophy
  - Increased T2 signal
  - Loss of internal architecture/abnormal morphology of the hippocampus
  - Look for second seizure focus, e.g. cortical migration disorder, hemosiderin, or encephalomalacia
Mesial Temporal Sclerosis

- MRI findings associated with severe or long-standing disease:
  - Atrophy of the ipsilateral fornix and mammillary body.
  - Atrophy of the cingulate gyrus.
  - Dilation of the temporal horn of the lateral ventricle.
  - Temporal lobe atrophy.
  - Increased signal and/or reduction in the volume of the amygdala.
  - Thalamic and caudate atrophy.
  - Limbic lobe: Papez circuit
Mesial Temporal Sclerosis

• Treatment:
  – Anti-epileptic medical therapies.
  – Temporal lobectomy or selective (hippocampectomy, amygdalohippocampectomy) in patients who fail medical management.
  – Anterior temporal lobectomy successful in 75-90% of patients with mesial temporal sclerosis.
References:

1. Radiopedia


