45M for w/u of Pituitary Dysfunction

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Coronal FLAIR at the Level of the Pituitary
Axial FLAIR
MR Spectroscopy (MRS)

Abnormal Brain MRS

Normal Brain MRS
Infiltrating Glioma
“Gliomatosis Cerebri”
There is thickening of the cortex (blue arrow) and invasion within the right temporal lobe.

- Normal grey matter thickness indicated by yellow arrow
The above images show the glioma involving more white than grey matter of the temporal lobe (blue arrow), right occipital lobe (yellow arrow), parietal lobe (green arrow), & right thalamus (white arrow).
FLAIR hyperintensity crosses the splenium of the corpus callosum to involve the left hemisphere (yellow arrow)

No significant gadolinium enhancement is identified
MRS of abnormal brain displays significant elevation of choline peak (white arrow) and decrease of NAA peak (red arrow) relative to creatine peak.

MRS of normal brain shows no such changes.
Infiltrating Glioma ("Gliomatosis Cerebri")

**Epidemiology:** Most often occurs between 20-40 years of age and affects males slightly more than females (1.5:1). Prognosis is poor with 26-52% of patients surviving less than 1 year.

**Classification:** Can be unclear but is generally organized by histological, clinical, and radiographic features

- Primary Gliomatosis Cerebri includes any *de novo* tumors and can be subdivided into Type 1 (no discrete mass) and Type 2 (discrete mass with diffuse CNS involvement)
  - Further subcategorization can be done with respect to IDH-gene classification (mutant vs. wildtype) and molecular grade
- Secondary Gliomatosis Cerebri follows the same classification structure above
Infiltrating Glioma (“Gliomatosis Cerebri”)

Imaging:
- **MRI:**
  - T1 shows hypo- or iso-intensity to grey matter and does not enhance with gadolinium administration
  - T2 shows hyperintensity to grey matter
  - MR Spectroscopy will show elevated Choline:Creatine and decreased Choline:NAA ratios relative to normal brains as well as elevated myoinositol levels
- **FDG-PET:**
  - Hypometabolism will be present in affected areas
- **CT:** Can often be normal due to isodensity of lesions relative to surrounding brain parenchyma
  - Mass effect can still be seen with Type 2 Gliomatosis Cerebri however an MRI would be required for further investigation
  - Hypoattenuation may be evident however it has been shown to be quite subtle if present

Other Possible Diagnoses
- Progressive Multifocal Leukoencephalopathy
- Multifocal/Multicentric Glioblastoma
- Primary CNS Lymphoma
- Encephalitis
References:


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