RING ENCHANCING LESION

BY

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• A 21 YRS FEMALE CAME WITH H/O HEADACHE AND SEIZURE FOR THE PAST ONE MONTH.
• NO OTHER FOCAL NEUROLOGICAL DEFICIT.
DIFFERENTIAL DIAGNOSIS

• For this case are
  • Neurocysticerosis
  • tuberculoma
• The dd For other ring enhancing lesion are
  • toxoplasmosis
  • Primary cns lymphoma
  • Abcess
• Primary tumour
• Metastases
• Resolving infarct and haemotoma
CEPT OF TUBERCULOMA
CECT OF TUBERCULOMA
MRI T1 OF TUBERCULOMA

- Shows thick rim of slightly hyperintense with central isointense partially surrounded by a slightly hypointense rim.
MRI-T2 OF TUBERCULOMA

- Shows a round slightly heterogeneous isointense and hypointense mass adjacent multiple small conglomerate hypointense nodules.
- Diffuse surrounding edema seen.
MRI- T1(CONSTRAT) OF TUBERCULOMA

- shows a ring shaped homogenous enhancement and adjacent conglomerate nodules.
TUBERCULOMA

• IMMATURE STAGE
  • NECT- iso or hyperdense
  • CECT- shows ring or nodular irregular enhancement.

• MATURE STAGE
  • NECT- well delineated round or oval lesion
  • Mass effect
  • Moderate surrounding edema
  • Central calcification.
TUBERCULOMA

- CECT - homogenous enhancement
- ring blush - with smooth or slightly shaggy margin and thick irregular wall around an isodense centre.
- Target sign - central calcification in isodense lesion and ring blush.
- Homogenous blush - enplaque along the dural plane.
TUBERCULOMA

- MRI
- T1- isointense to brain
- Marked enhancement on t1
- T2- central hyperintense with hypointense rim on t2

NON CAESATING GRANULOMA
- hypointense to brain on t1
- Hyperintense on t2
- Homogenous nodular enhancement.

CAESATING GRANULOMA
- ISOINTENSE TO MARKEDELY HYPERINTENSE ON T2
- RIM ENHACEMENT ON T1
NECT OF BRAIN ABCESS (EARLY CEREBITIS)

- There is a poorly ill defined area in left parietal lobe surrounding edema.
MRI T2 BRAIN ABCESS

- There is a well defined thin walled mass is noted in right frontal region.
- Surrounding edema and mass effect is noted.
• There is a well-defined ring enhancing lesion noted on right parietal region.
• Surrounding edema is present.
MRI OF T1 CONTRAST OF ABCESS

- There is well-defined ring enhancing mass seen in the cp angle.
There is markedly increased in intensity from the mass.
BRAIN ABCESS (EARLY CEREBRITIS)

- NECT- normal or show only a poorly marginated hypodense area.
- Gas within the lesion is a diagnostic of gas forming organism.
- CECT- shows an illdefined contrast enhancing area with edematous region.
- MRI- a ill defined hyperintense zone to be noted on T2.
- Constrat t1- poorly delineated enhancing area with iso to hypodense edematous region.
ABCESS (LATE CEREBRITIS)

- SHOWS IRREGULAR ENCHANCING RIM THAT SURROUNDS CENTRAL LOW DENSITY AREA IS TYPICAL.
- DELAYED- SHOWS CONTRAST FILLS THE CENTRAL AREA.
- PERIPERAL EDEMA.
- MASS EFFECT SUCLI OBLIERTATION APPERANT
- CENTRAL NECROTIC AREA IS TYPICAL HYPERINTENSE TO BRAIN ON T2 AND PROTON.
- THICK RIM APPEARS ISO TO HYPOINTENSE.
- THICK RIM APPEARS ISO TO HYPERINTENSE ON T1.
ABCESS ( EARLY & LATE CAPSULE ON CT)

• EARLY CAPSULE
• A WELL DEFINED CAPSULE THAT ENCHANCE STRONGLY AND UNIFORMLY.
• WALL THICKEST NEAR THE CORTEX AND THINNER NEAR EPENDYMAL.
• MODERATE VASOGENIC EDEMA.

• LATE CAPSULE
• RIM ENCHACEMENT MAY PERSIST
• EDEMA SHRINKS
• MULTILOCULATION AND SUBADJCENT DAUGHTER ABCESS IN WHITE MATTER.
ABCESS ( EARLY AND LATE ON MRI)

• CAPSULE ENCHANCE ON T1.
• THIN WALLED HYPOINTENSE RIM ON T2.
MRI OF TOXOPLASMOSIS

• Constrast enhanced T1 weighed images showing well defined ring enhancing lesion is seen
Plain MRI-T1 of Toxoplasmosis

- It shows a well defined hypointense mass in the right parietal region.
- The mass compressing the right lateral ventricle.
MRI - T2 OF TOXOPLASMOsis

- Shows large bilateral hyperintense lesion placed on either side of third ventricle and lateral ventricle.
- There is slight mass effect over the right ventricle.
toxoplasmosis

- CECT- shows multiple or solitary ring enhancing masses with periperal edema (target sign).
- MRI- t1- iso to hypointense
- t2 iso to hyperintense
- Restricted diffusion signal is high.
- Calcification and haemorrhage can be demonstrated.
NECT OF LYMPHOMA

- There is a hyper dense mass in right parietal lobe surrounded by low density zone with vasogenic edema.
NECT OF LYMPHOMA

• There is a lobulated mass which is hyperattenuating the mass is extending across the splenium of corpus callosum.
CECT OF LYMPHOMA

- There is a homogenous enhancement of mass with surrounding edema.
MRI - T2 OF LYMPHOMA

- There is a heterogenous mass with low signal intensity.
- Central linear hyper intensity suggesting necrosis.
- There is also vasogenic edema.
MRI (CONSRAT T1 ) OF LYMPHOMA

- There is homogenous enchacement of the mass.
- There is also mass effect over the ventricle.
MRI – T2 LYMPHOMA

- There is nodular well defined right frontal sub cortical lesion with central hypointense core.
MRI (CONSTRAT T1) OF LYMPHOMA

- There is enhanced solitary ring-like enhancement of mass and peripheral low signal intensity is seen.
LYMPHOMA

• **CT**
• NECT- iso to hyperdense
• Little mass effect with paucity of peritumoural edema.
• CECT- homogenous dense and well defined to irregular contrast enhancement.
• Thick walled ring enhancement
lymphoma

- MRI
- Well demarcated round/ oval/ gyral shaped mass.
- Relatively little mass effect.
- T1- iso/hypointense
  - ring shaped enhancement.
- T2- iso/ hyperintense
- Ring pattern – central necrosis with densely cellular rim seen hyperintense and edema.
lymphoma

- angio
- Avascular mass with neovascularity.
- Focal blusih in late arterial to capillary phase persisting well into the venous phase.
- Arterial encasement.
- Dilated deep medullary vlen.
BRAIN METASTASES

- A WELL DEFINED RIM ENCHACEMENT IS SEEN
- SURROUNDING EDEMA.
METASTASES

• CT
• NECT- mostly isodense to brain
  some will be hyperdense seen eg small round cell tumour and neoplasm with high nuclear and cystoplasmic ratio.
• Edema will be present.
• Calcification and cystic changes are rare.
• Haemorrhage also will be seen.
• CECT- solid and ring enchance pattern are seen but not all metastases enchance strongly
METASTASES

- MRI- SIGNAL INTENSITY VARIES
- T1- some non haemorrhagic metastases are hypointense to brain.
- some non haemorrhagic metastases are hyper intense to brain (melanoma).

T2- hyperintense (punctate high signal foci)
hypointense (gastrointestinal adeno ca).

Contrast- all metastases do not enhance.
Solid rim and mixed enhancement pattern.
High dose mostly useful.
Primary tumour - astrocytoma

- CT
- NECT – inhomogenous mixed density
- little discernible mass effect.
- Intra tumoural heamorrhage.
- Calcification is uncommon until malignat degeneration.
- CECT- enchance strongly but non uniformly.
- Irregular rim enchancement.
ASTROCYTOMA

MRI

• Poorly delineated lesion that have heterogenous signal intensities on t1&t2.
• Mixed iso to hypodense area are seen on t1.
• Central core of hyperintensity surrounded by an isointense rim with peripheral finger like high intensity projection secondary to vasogenic edema.
• CONTRAST- irregular peripheral rim like enchancement and edema surrounds mass.
Vesicular stage of neurocysticercosis cect and plain mri
MASSIVE NEUROCYSTICEROSIS
COLLIDAL VESICULAR STAGE
CYSTICEROSIS WITH ENCEPHALITIS
CALCIFIED NEUROCYSTICEROSIS ON CT WITHOUT EDEMA AND MRI WITH EDEMA
SUB ARCHNOID CYSTICEROSIS
VENTRICULAR NEUROCYSTICEROSIS

- It may produce obstructive hydrocephalus caused by blockage with various portion of ventricular systeam.
Vesicular stage

- Larvum appears as round csf like cyst with a mural nodule (scolex).
- Edema and enhancement are rare during this stage.
Collidal vesicular stage

- Ct
- During this stage ring enhancement is seen.
- Edema will be present.
- mri
- Cyst fluid will be hyperintense to csf.
- Ring capsule enhancing on t1.
- Hypointense mural nodule with strong homogenous enhancement on t2.
Granular nodular stage

- CT
- Nect- isodense cyst and with a hyper dense calcified scolex.
- Edema will be present.
- Cect- ring enhancement will persist.
- MRI
- T1- isointense to brain
- T2- hypointense
- Constrat- nodular or ring enhancement.
Nodular calcified stage

- CT
- NECT- small calcified nodule without mass effect.
- CECT- typical enhancement
- Bull eye appearance
- Rice like muscle calcification.