ISCHEMIC STROKE IMAGING

ผศ.พญ.จุรีรัตน์ ธรรมโรจน์
ภาควิชารังสีวิทยา คณะแพทยศาสตร์
มหาวิทยาลัยขอนแก่น
A case of acute hemiplegia

Which side is the abnormality, right or left?
Early Right MCA infarction - CT

- Right hemisphere low density
- Loss of Insular ribbon sign
  (loss of right insular corticomedullary junction distinction)

NB; normal left side
- Well defined insular cortex
- Well defined lentiform nucleus
Early Right ACA+ MCA infarction

- Low density at right frontal and temporal lobe
- Effacement sylvian fissure
- Hyperdense arterial sign
Right MCA thrombosis, infarction-CT

- Hyperdense artery sign
- Cord sign
- Temporal lobe low density with mass effect
Posterior cerebral a. infarction
(occipital lobe & inferior aspect of temporal lobe)
Balance blood supply between PCA/ MCA
Basilar artery occlusion
Lacunar infarction

- Small areas of low density in right basal ganglia (lacuna)
- Deep seated or small vessels infarction (DDX, thrombosis, emboli, Co2 poisoning)
Subacute infarction

Follow up 3 weeks later
Subacute infarction

- Decrease mass effect, Gyral enhancement
- Luxury perfusion / collateral circulation
- DDX. Cerebritis / inflammation
Water shed infarction
Looking for pathology of ICA
A case of left hemiplegia for 3 days
then progression of conscious change and neurological deficit

Massive right cerebral infarction with hemorrhagic transformation
SSS thrombosis - CT

- Case of female with headache, conscious change, and convulsion.
- Empty delta sign in SSS in post contrast CT.
- Left cerebral hemisphere edema.
Venous infarction, sagittal sinus thrombosis

Hypodensity area within the white matter
A case of coma

- Thrombosis in deep venous system (internal cerebral V)
- Low density in bilateral thalami and basal ganglia edema
- Small hemorrhage
A case of coma

- From hypoxia, brain death
  Generalize low density of the whole brain.
- Relative small ventricle, cisterns and sulci
- Poor gray-white differentiation

Diffuse cerebral edema
Hemorrhagic stroke

Hypertensive

Non hypertensive

Rupture vascular structure, AVM / aneurysm
Bleeding tumor
Hypertensive hemorrhage, ICH
Basal ganglia, external capsule, thalamus, pons, cerebellar hemisphere

Pt. With underlying HT
A case of headache, hypertension and seizure

Underlying HT, renal

Low density in bilateral occipital lobe at cortex or subcortical along PCA
Disappearance after treatment of HT / underlying dz.
DDX; PCA infarction

Posterior Reversible Encephalopathy Syndrome (PRES) - CT
Rupture AVM, multi-compartmental bleeding
Uncommon location for HT

ICH and IVH
Rupture AVM (continue)
Pial (parenchyma) AVM

No mass effect, minimal surrounding brain atrophy
Multiple Carvernoma, unbleed, no mass effect
A case of severe sudden headache

- High density lesion in the cisterns
  - Sylvian fissures
  - Interhemispheric fissures
  - Basal cistern
  - Obstructive hydrocephalus

SAH --- rupture aneurysm
trauma
Localized SAH, located site of aneurysm
Rupture MCA aneurysm with large ICH
Unruptured thrombosed RT.PCA aneurysm
Bleeding tumor (high grade astrocytoma)

Established evidence of surrounding brain edema on T2W
Conclusion

- **Hemorrhagic stroke**
  - Hypertensive
  - Non hypertensive (vascular rupture)
  - Bleeding tumor
  - Arterial infarction with hemorrhagic transformation
  - Venous infarction with parenchymal he.

- **Ischemic -Infarction**
  - Thrombosis / emboli
  - Arterial or venous
  - Large or small vessel.
  - Hypotensive infarction
    - Border-zone (water –shed)
  - Hypertensive encephalopathy
    - posterior reversible encephalopathy
Vascular territory
Signs of infarction- NECT

- Hyperdense vessel; MCA
- Loss of gray-white distinction
  - Obscuration of deep nuclei
  - Loss of insular ribbon
- Parenchymal hypodensity
- Gyral swelling, sulcal effacement
- Hemorrhagic transformation (24-48 hrs)
Signs of infarction- CECT

- Absent vessel = occlusion
- Enhanced cortical vessels = slow flow or collateral
- DDx cerebritis, vasculitis
Brain edema & mass effect

- Vasogenic edema
  - tumor
- Cytotoxic edema
  - metabolic
- Interstitial edema

- Ischemia = cytotoxic + vasogenic
REFERENCES

- Anne G. Osborn. Diagnostic imaging; brain 2004