Strokes part 2

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Outline

1. Differential diagnosis of stroke
2. Diagnosis of stroke
3. Management of strokes

Differential diagnosis of stroke

1. Migraine. (The aura)
2. Seizures. (The post-ictal state –Todd's paralysis)
3. Intracranial tumor.
4. Intracerebral infection.

Diagnosis of stroke

Common stroke locations and corresponding signs and symptoms	
ACA	Contralateral lower extremity and trunk weakness
MCA	Contralateral face and upper extremity weakness and decreased sensation, bilateral visual abnormalities, aphasia (if dominant hemisphere), neglect, and inability to perform learned actions (if nondominant hemisphere)
PCA	Contralateral visual abnormalities, blindness (if bilateral PCA involvement)
Lacunar arteries	Focal motor or sensory deficits, loss of coordination, difficulty speaking
Basilar arteries	Cranial nerve abnormalities, contralateral full body weakness and decreased sensation, vertigo, loss of coordination, difficulty speaking, visual abnormalities, coma.

ACA= anterior cerebral artery ,MCA=middle cerebral artery, PCA=posterior cerebral artery

Investigations of stroke and TIA

- **A- Immediate (initial) investigations:**
- **Full blood count (FBC):** polycythaemia; infection
- **Renal function and electrolytes.**
- **Clotting screen (PTT, PT, INR.**
- **Erythrocyte sedimentation rate (ESR); C-reactive protein (CRP):** inflammatory disease
- **Thyroid function tests:** all patients with atrial fibrillation
- **Blood sugar:** hypoglycaemia and diabetes mellitus
- **Fasting lipids**
- **Blood culture:** if endocarditis or a superadded infection is suspected

Investigations of stroke and TIA

- **A- Continue: Immediate (initial) investigations:**

- **Autoantibodies and coagulation studies in young patients:** connective tissue or vasculitic disease or prothrombotic disorder

- **Electrocardiography (ECG):** arrhythmia, myocardial ischaemia/ infarction and left ventricular hypertrophy secondary to hypertension

B- special investigations

1.Imaging:

❑ Non contrast CT scan

- CT is more commonly available acutely
- CT scans can identify or exclude hemorrhage as the cause of stroke,
- CT scans can identify extraparenchymal hemorrhages, neoplasms, abscesses, and other conditions masquerading as stroke.
- CT scans can identify the presence of haemorrhagic infarction

- Only 75% of infarcts are ever visible on CT!
- Brain CT scans obtained in the first several hours after an infarction generally show no abnormality, and the infarct may not be seen reliably for 24–48 h.
- CT may fail to show small ischemic strokes in the posterior fossa
- CT may fail to show small infarcts on the cortical surface

Continue :B- special investigations->Imaging:

❑MRI

- should be considered if the clinical signs localize to the posterior fossa (i.e. brainstem and cerebellum).
- MRI should also be considered in patients who may have had a small stroke, which may not be visible on CT, or where the diagnosis is uncertain.
- T2* sequences can detect microhaemorrhages

❑**Diffusion weighted imaging (DWI)** is the most sensitive modality for diagnosing an acute ischemic infarct.

- DWI can differentiate acute from chronic infarcts.

❑ Carotid Doppler

- non- invasive
- Useful in demonstrating internal carotid artery stenosis when carotid thromboembolism is suspected.

❑ CT angiography

- Carotid disease and intracranial vascular occlusions are readily identified with this method

❑ MR angiography (MRA)

- **Non invasive**
- Useful in visualizing carotid disease if Doppler not enough

•Indications of angiography:

1. In those patients with anterior circulation TIA or minor stroke if non-invasive techniques have not clarified the nature and degree of carotid stenosis.

2. In patients where unusual aetiologies are suspected and less invasive imaging has not been diagnostic

- Note:

In patients with a recent completed stroke, angiography should not be considered until 1–2 weeks have elapsed

- ❑ **Echocardiography**
- ❑ **Holter monitoring**


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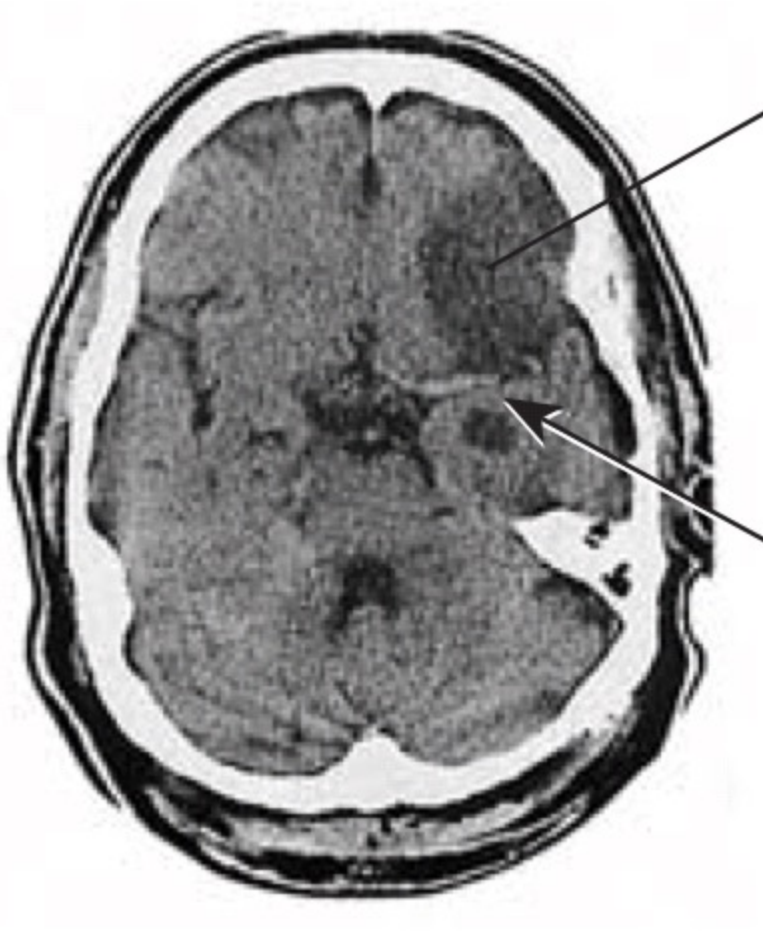
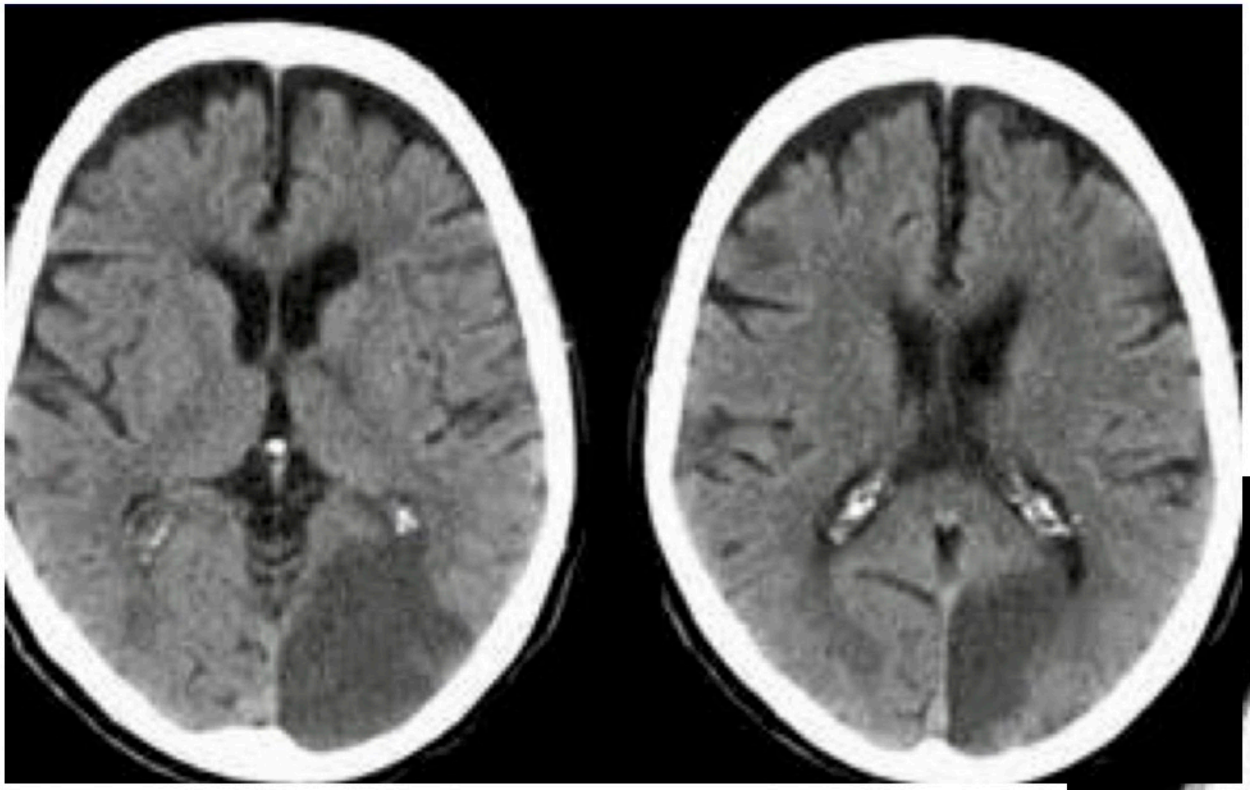
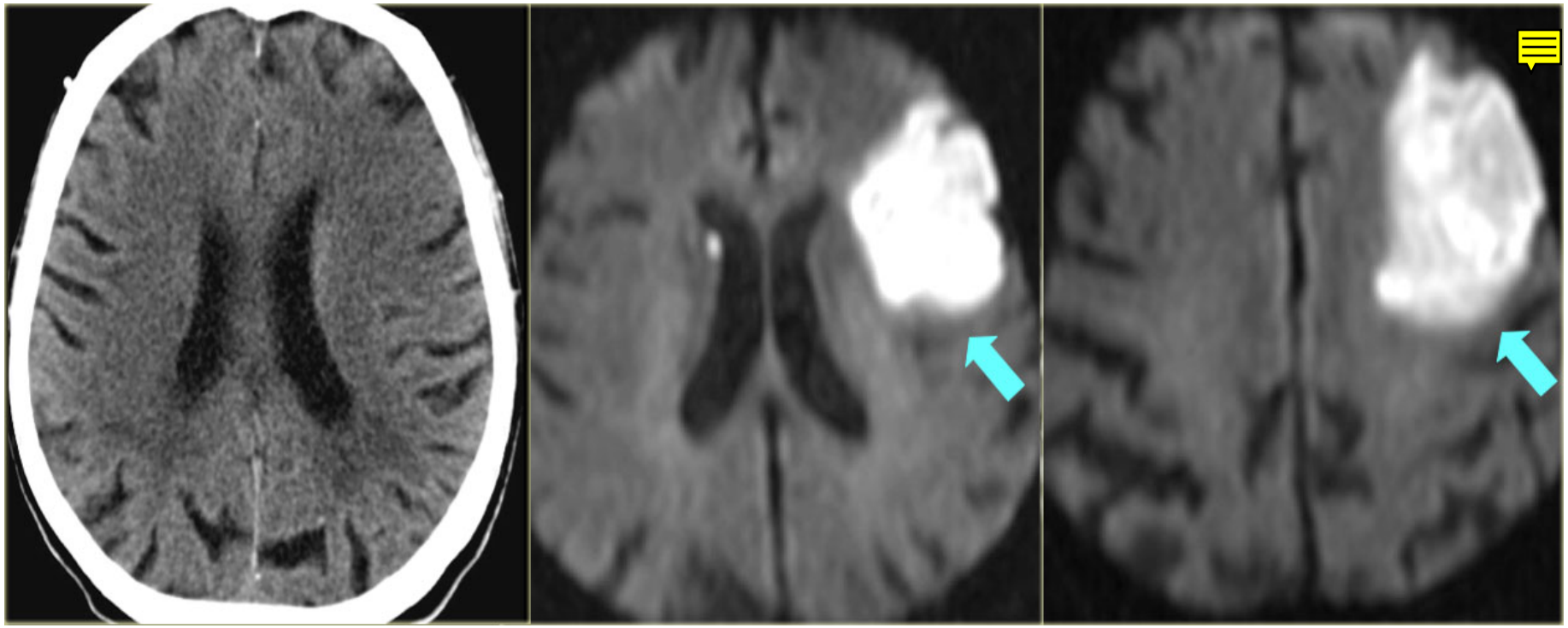


Frontal infarct

(note hyperdense thrombosed middle cerebral artery)

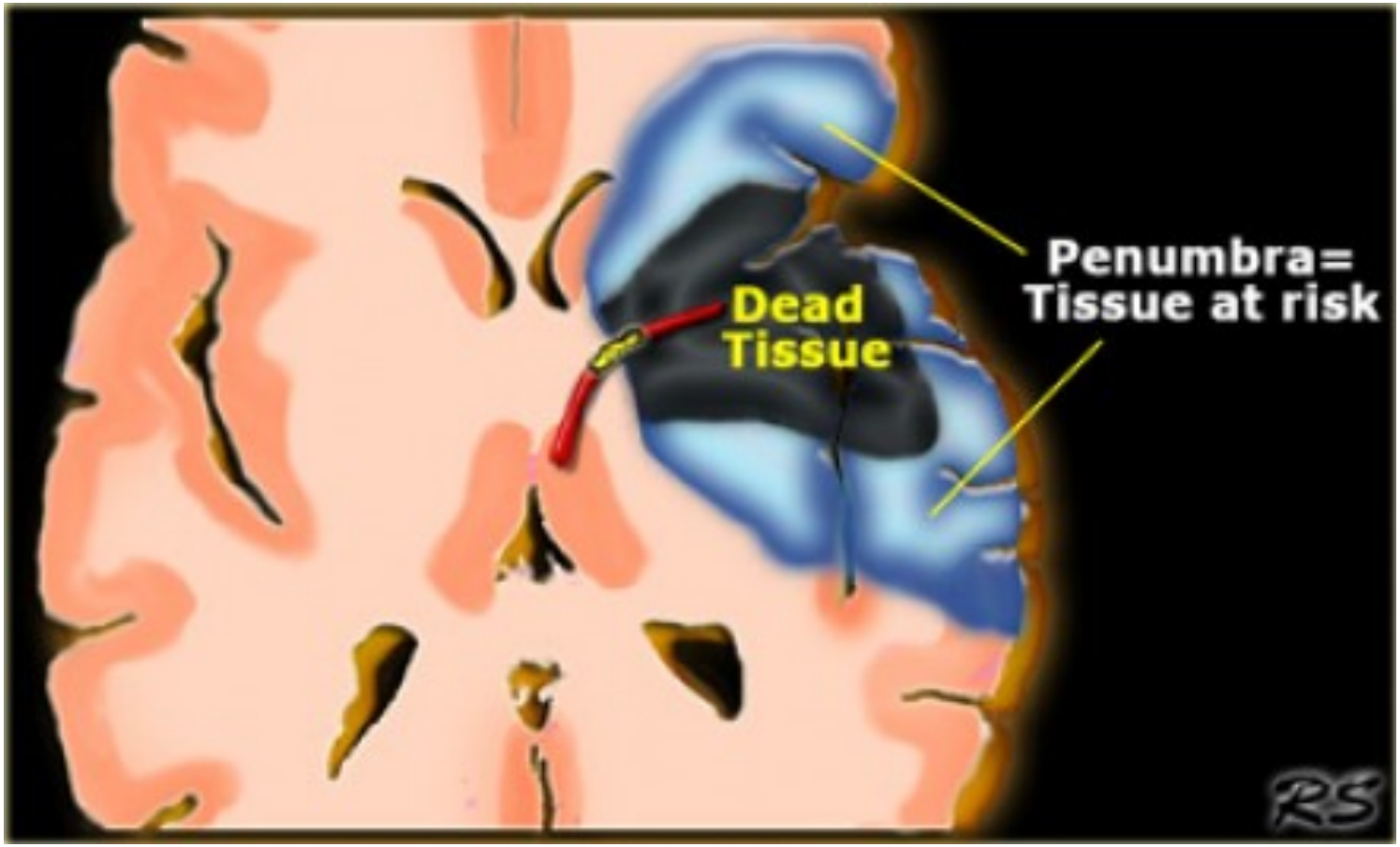




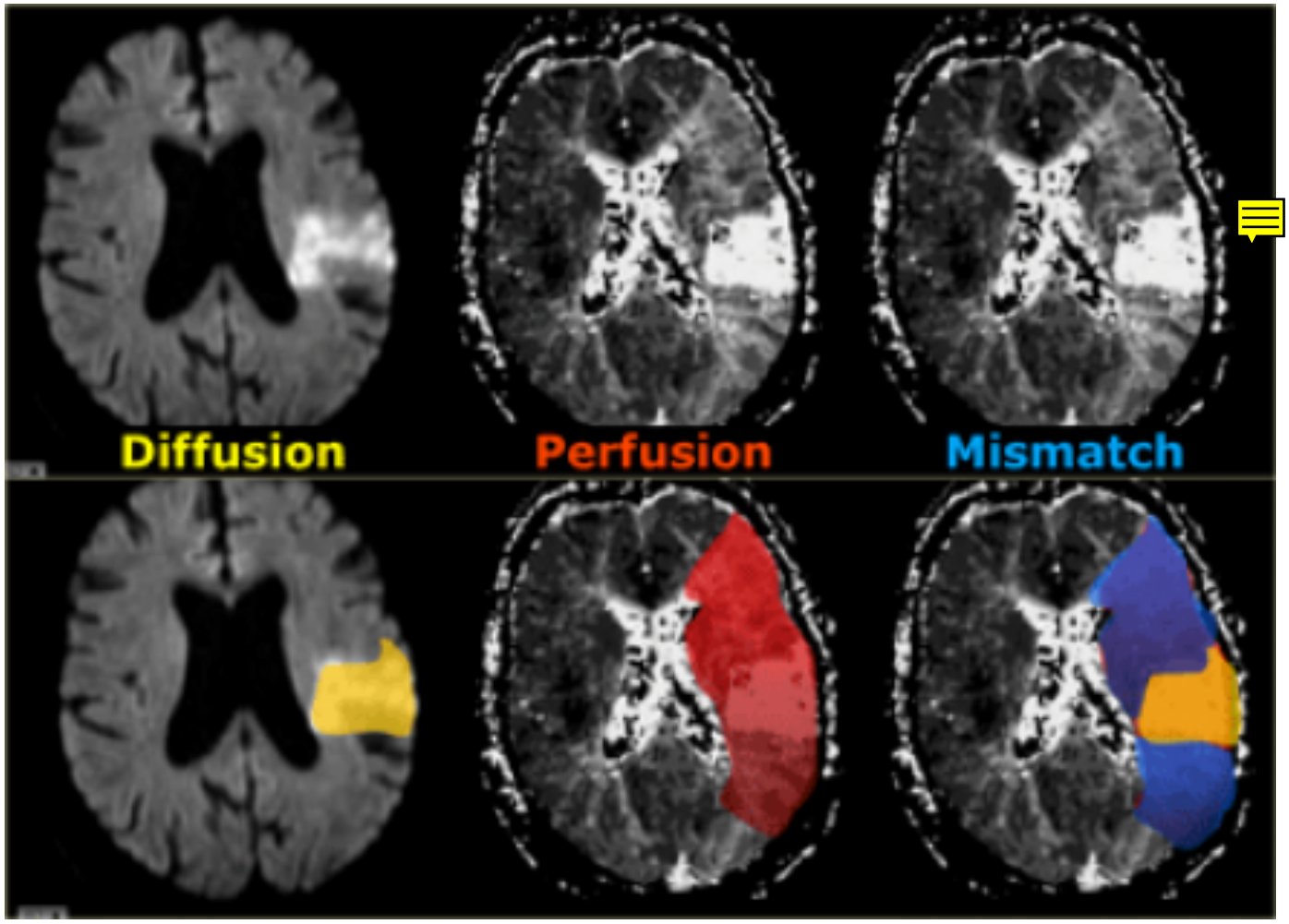
CT

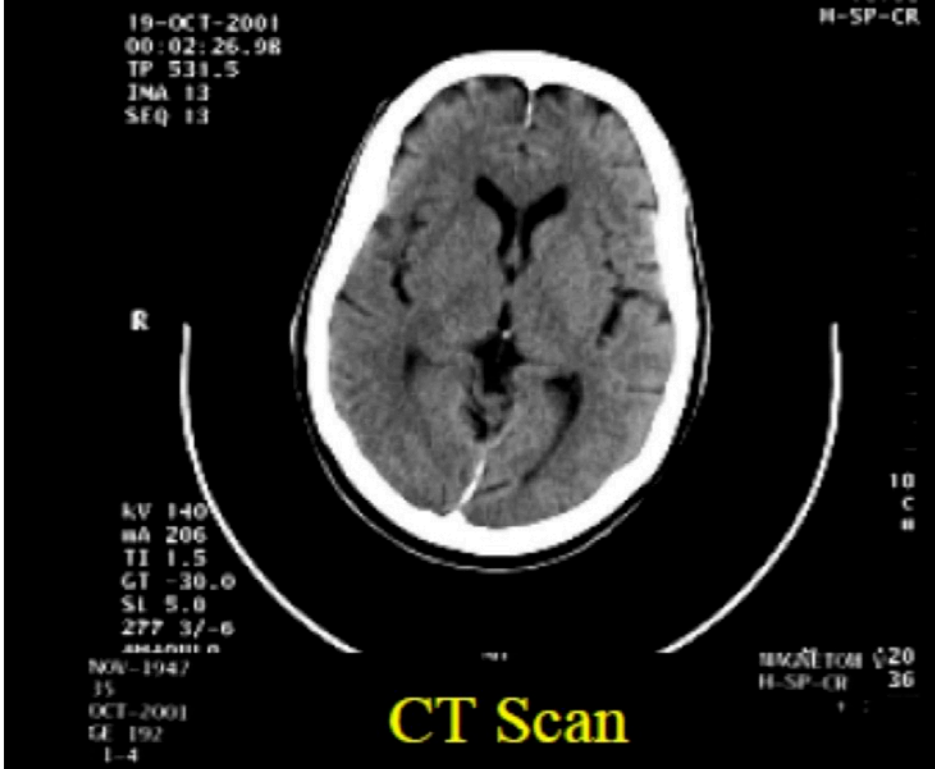
MRI (DWI)

Ischemic penumbra

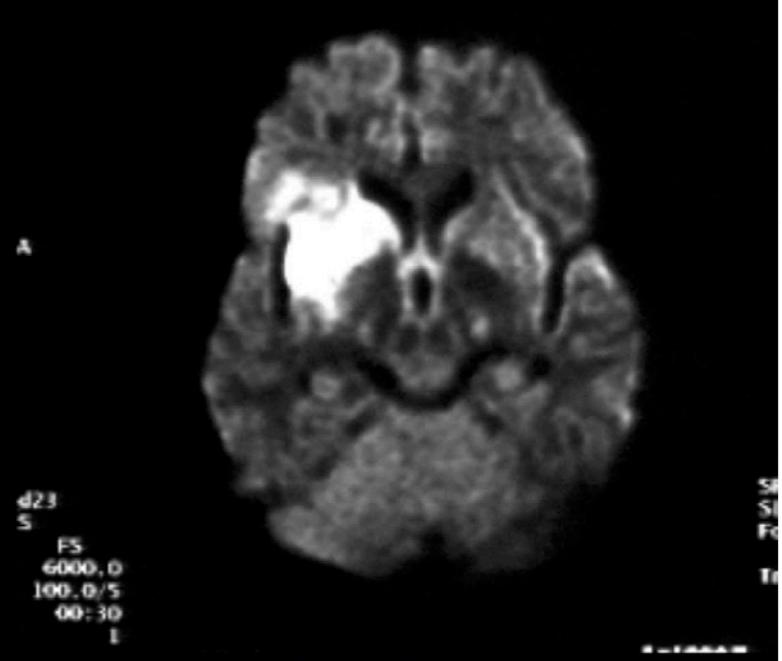


Diffusion Perfusion Mismatch



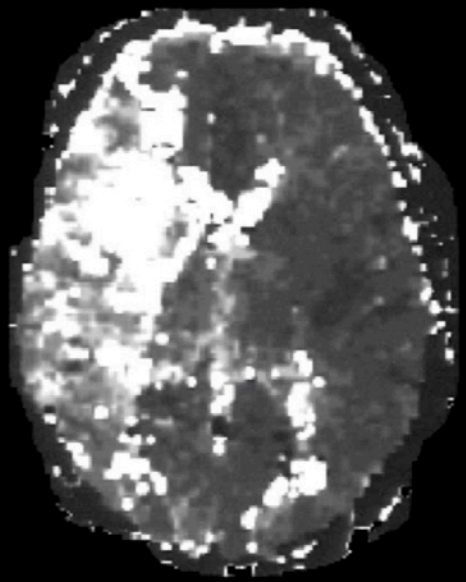


CT Scan



DWI scan

T2



Perfusion

Management : aims

1. Management of acute stroke in hyperacute stroke units.
2. Prevention of secondary complications.
3. Prevention of stroke (primary, secondary, tertiary {Rehabilitation})

Management of acute stroke

- Airway
- Breathing
- Circulation
- Hydration
- Nutrition
- Medications
- Blood pressure
- Blood glucose
- Temperature
- Pressure areas
- Incontinence

❖Management of hemorrhagic stroke

- No antiplatelet therapy
- Aggressive management of blood pressure
- Frequent neurological checks for change in clinical status
- Find a cause of bleed

❑Surgery (coiling or clipping the artery)

❖Management of ischemic stroke

❑Thrombolysis:

- Intravenous thrombolysis with recombinant tissue plasminogen activator (rt-PA)
- Best given within 60 min after symptoms.
- It should be administered within 3-4.5 hours of the appearance of symptoms.

What to do after thrombolysis?

- Careful intensive care monitoring & Frequent neurological checks
- Management of blood pressure
- Start intravenous mannitol for signs of herniation
- Get CT scan for change in clinical status
- No thrombolytics, anticoagulants, or antiplatelet agents for first 24 hours

What if patient does not get thrombolysis?

- Start antiplatelet therapy
  - Aspirin
  - Clopidogrel (Plavix)®
  - Dipyridamole + Aspirin (Aggrenox)®
- Manage blood pressure
- Frequent neurological checks for change in clinical status

Indications of thrombolytic treatment

1. Clinical diagnosis of stroke Onset of symptoms to time of drug administration less than or equal 3 hours
2. CT scan showing no hemorrhage or edema of >1/3 of the MCA territory
3. Age w18 years
4. Consent by patient or surrogate

contraindications of thrombolytic treatment

1. Sustained BP >185/110 mmHg despite treatment
2. Platelets <100,000; HCT <25%; glucose <50 or >400 mg/dL
3. Use of heparin within 48 h and prolonged PTT, or elevated INR
4. Rapidly improving symptoms
5. Prior stroke or head injury within 3 months; prior intracranial hemorrhage
6. Major surgery in preceding 14 days
7. Minor stroke symptoms
8. Gastrointestinal bleeding in preceding 21 days
9. Recent myocardial infarction Coma or stupor

Primary prevention

- Control the hypertension by antihypertensive medication.
- Avoidcigarettesmoking
- Control diabetes
- Control dyslipidemia by Statins
- Atrial fibrillation: anticoagulation
- Diet and nutrition: decrease Na intake intake.
- Physical activity

Secondary prevention

- ❖ Antiplatelet medications
- ❑ NICE recommends clopidogrel, if intolerant then give:
- ❑ The combination of Asprin and dipyridamole, if intolerant then give:
- ❑ Dipyridamole alone
- ❖ Risk factor management:
- ❑ Stop smoking
- ❑ Statins-> correction of lipid abnormalities
- ❑ Good glycaemic control

Continue :Secondary prevention

- Diet and exsersize
- Remove or treat embolic source, e.g. anticoagulation, antibiotics for endocarditis or endarterectomy.
- Note: anticoagulation is indicated for cardiac embolus, but only once a cerebral hemorrhage has been excluded and not for at least 7 days after an acute event, to prevent a hemorrhagic infarct.

Tertiary prevention

Rehabilitation should begin as soon as possible

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