Ischemic Stroke

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PG FINAL YEAR
GENERAL MEDICINE

- ETIOLOGY
- CLINICAL FEATURES
- MANAGEMENT

DEFINITION

- Abrupt onset of a neurological deficit that is attributable to a focal vascular cause.

Clinical classification of ischemic stroke

- **Transient ischemic attack**: focal neurological deficit resolves completely within 24 hours regardless of whether there is imaging evidence of new permanent brain injury.

- **Reversible ischemic neurological deficit**: completely resolves within 1-3 weeks

- **Evolving stroke**: gradual stepwise development of neurological deficit

- **Complete stroke**: rapid onset, persistent neurological deficit which does not progress beyond 96 hours

COMMON CAUSES

Thrombosis

- Small vessel
- Large vessel

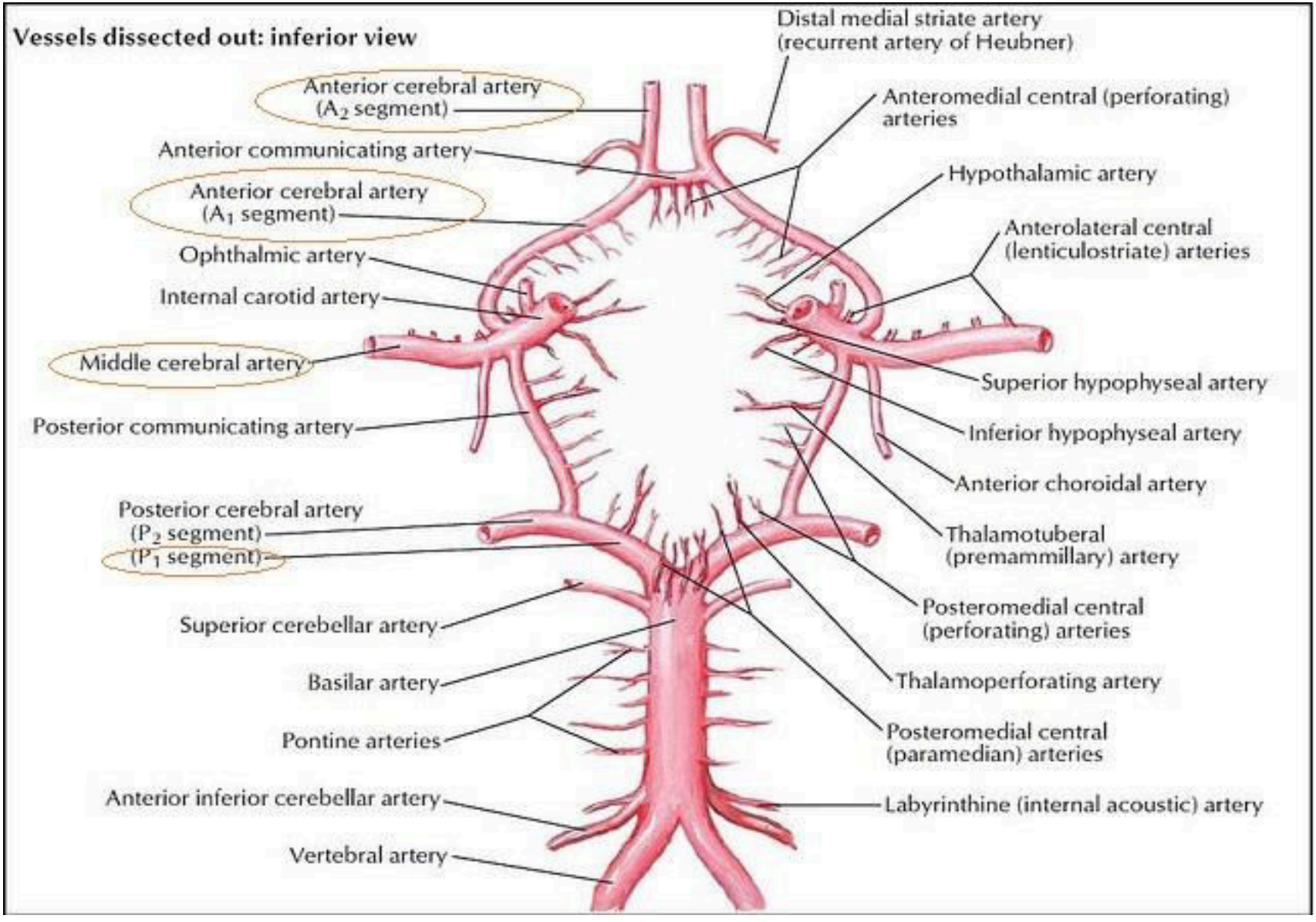
Embolic

- Artery to artery
- Cardioembolic
- Valvular
- Paradoxical embolus
- Atrial septal aneurysm

UNCOMMON CAUSES

- Hypercoagulable states
- Vasculitis
- Drugs: cocaine, amphetamine, OCP
- Eclampsia
- Moya moya disease

Circle of Willis



Types

- **Large vessel stroke**
  - anterior circulation stroke
  - posterior circulation stroke

- **Small vessel stroke**
  - lacunar stroke

ANTERIOR CIRCULATION STROKES

- Arising from internal carotid artery and its branches.
- **Middle cerebral artery**

  - Structures involved : frontal, parietal, temporal

- Clinical features
- C/L hemiplegia
- hemianaesthesia
- hemianopia
- gaze palsy

ANTERIOR CEREBRAL ARTERY

Structures involved : frontal lobe and superior medial parietal lobe

CLINICAL FEATURES

- Weakness of contralateral foot and leg
- Sensory loss of contralateral foot and leg
- Gait apraxia
- Abulia
- Urinary incontinence

- **ANTERIOR CHOROIDAL ARTERY**

C/F : Contralateral hemiplegia, hemianaesthesia, hemianopia.

- **INTERNAL CAROTID ARTERY**

C/F : Hemiplegia, hemianaesthesia, aphasia, anosognosia, amaurosis fugax.

- **COMMON CAROTID ARTERY**
- Takayasu arteritis

- **<u>POSTERIOR CIRCULATION STROKES</u>:**

- Posterior cerebral artery
- Vertebral artery
- Basilar artery

- **POSTERIOR CEREBRAL ARTERY**

- **P1** : midbrain, subthalamic, thalamic

C/F – IIIrd nerve involvement with contralateral ataxia/ hemiplegia

- **P2** : medial temporal, occipital

C/F – contralateral homonymous hemianopia with macular sparing, memory disturbance, alexia without agraphia, peduncular hallucinosis, cortical blindness

- VERTEBRAL ARTERY
- Arises from the innominate artery on the right and subclavian artery on the left.

- C/F:
- Vertigo
- Speech disturbances
- Visual field defects
- Ataxia
- Drop attacks

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LATERAL MEDULLARY SYNDROME

- On the side of lesion
- Pain, numbness and impaired sensation on one half of the face.
- Ataxia
- Horner's syndrome
- Dysphagia
- Hoarseness
- Paralysis of palate and vocal cord
- Loss of taste
- Diminished gag reflex
- On the opposite side of lesion
- Impaired pain and thermal sense on half of body

MEDIAL MEDULLARY SYNDROME

- On the side of lesion
- Paralysis with atrophy of one half of tongue
- On the opposite side of lesion
- Paralysis of arm and leg sparing face
- Impaired tactile and proprioceptive sense

- BASILAR ARTERY

- Supplies base of pons, superior cerebellum.

- **C/F** :
- Vertigo
- Diplopia
- Dysarthria
- Facial or circumoral numbness
- Ataxia
- Contralateral loss of pain and temperature

Small vessel stroke

LACUNAR STROKE

- Infarction following atherothrombotic or lipohyalinotic occlusion of small artery.
- Size : 3mm – 2 cm in diameter
- C/F :

  - pure motor hemiparesis
  - pure sensory stroke
  - ataxic hemiparesis
  - dysarthria / clumsy hand

Management

- **Investigations**

- Imaging: CT, MRI, Angiography, carotid doppler
- ECG, 2D-echo
- Laboratory tests:
  - CBC, Lipid profile,
  - Blood glucose
  - ESR
  - Serology

Treatment

- **Medical support** : -airway care

  -blood pressure

  -fever

  -hyperglycemia

  -seizures

Thrombolysis :

- **INDICATIONS**

- Clinical diagnosis of stroke
- Onset of symptoms to time of drug administration < 3 hours
- CT scan showing no hemorrhage or edema of > 1/3rd of MCA territory
- Age > 18 years
- Consent by patient or surrogate

- **<u>CONTRAINDICATIONS:</u>**

- Sustained BP > 185/110 mm Hg despite treatment
- Platelet < 100000/cu mm , HCT < 25%, Glucose < 50 or > 400 mg/dl
- Use of heparin within 48 hours and prolonged PTT or elevated INR
- Rapidly improving symptoms
- Prior stroke or head injury within 3 months, prior intracranial hemorrhage
- Major surgery in preceding 14 days, minor stroke symptoms
- GI bleeding in preceding 21 days
- Recent MI, coma or stupor

ADMINISTRATION OF rt-PA

- Intravenous access with 2 peripheral IV lines (avoid arterial or central line placement)
- Administer 0.9 mg/kg IV (maximum 90 mg)IV as 10% of total dose by bolus followed by remainder of total dose over 1 hour.
- Frequent cuff blood pressure monitoring.
- No other anti thrombotic treatment for 24 hours.
- For decline in neurological status or uncontrolled BP, stop infusion, give cryoprecipitate and reimage brain emergently
- Avoid urethral catheterization for more than 2 hours.

- **<u>Endovascular procedures</u>**:

  -Intraarterial pro urokinase for MCA occlusion

  -Endovascular mechanical thrombectomy

- **<u>Anti-thrombotic therapy</u>**:

  -Aspirin

  -clopidogrel

- **<u>Neuro-protection</u>**:

  -NMDA receptor antagonist, citicoline, fiblast

  -hypothermia

Long term Management

- Rehabilitation
- Nutrition
- Infections
- DVT
- Pressure sores
- Incontinence
- Depression & Anxiety

THANK YOU