Assessment and diagnosis in stroke
OBJECTIVES

• You should know
  1. The essential clinical features to be elicited
  2. The essential investigations to be performed
  3. Understand some of the differential diagnosis
  4. Understand the basic subtypes of stroke
     Pathology – what?
     Anatomy – where?
     Mechanism – why?

• You should be able to diagnose and assess a patient with suspected stroke
• 65 year old man
• Found collapsed at home by wife
• Not moving right side very well
• Not speaking
• nicotine stained fingers
• bp 190/110

Positively diagnose stroke
CT normal
IMMEDIATE CLINICAL APPROACH

ABC
Check blood sugar
Glasgow Coma Scale  <12 consider nasal airway
<8 consider intubation
Pyrexia, neck stiffness
Oxygen
IV access
RAPID neurological assessment  motor
speech
visual
sensory
Clinical syndrome

- Syndrome of focal neurological symptoms and signs
- Sudden onset
- Symptoms maximal within minutes to hours
- Predominantly negative symptoms

MAKE A POSITIVE DIAGNOSIS!
Conditions that mimic acute stroke

411 patients initially diagnosed as having stroke

333 patients confirmed to have had stroke

78 (19%) of these eventually diagnosed as some other condition

Seizure (17%)
Systemic infection (17%)
Brain tumour (15%)
有毒-代谢 (13%)
History

- Onset – spread of symptoms?
- Focal symptoms – motor/ sensory/ language/ visual
- Trauma, previous history, systemically unwell
- Risk factors
- Normal functional level – goal setting
Examination

• General
  – Cardiovascular
    • Pulse / BP / Murmurs / Bruits
  – Chest
    • Pneumonia
Examination

- Neurologic
  - “standard” cranium and limbs
    - language/ motor/ sensory/ visual
  - status – degree of consciousness – GCS
  - swallow
Multidisciplinary assessment

- Nursing
- Functional disability
- Communication
- Swallowing function
- Movement disability
- Nutritional risk
Objectives revisited

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Diagnosis – Pathology

What?

• **80% ischaemic** vs 20% haemorrhagic

• No reliable clinical method
  – Haemorrhage:
    • ? ↓ GCS
    • signs of ↑ ICP
    • headache?
    • on warfarin?

• **Neuroimaging** - only way to be sure
Infarction or Haemorrhage?
Diagnosis – Anatomy
Where?

Superficial branches of the middle cerebral artery
Deep branches of the middle cerebral, supply visual radiation
Vessels that tend to rupture
Thalamo-geniculate and thalamo perforating arteries
Posterior cerebral artery
Short and long penetrating arteries to the peduncle and midbrain
Trituration of the middle cerebral artery
6–8 lenticulostriate arteries. Branches of the middle cerebral artery
Branches of posterior cerebral artery to the infero-mesial surface of the temporal lobe
Anterior choroidal artery
Internal carotid artery
Forward sweep of the anterior cerebral artery
Posterior communicating artery
Basilar artery
Brain cross section showing the arteries after injection of contrast
Anatomy – Where?

- Anterior cerebral artery
- Anterior choroidal arteries
- Lenticulostriate arteries
- Middle cerebral artery
- Posterior cerebral artery
Arterial territories and clinical presentations

- **Anterior circulation – carotid + branches**
  - Ophthalmic - amaurosis fugax
  - MCA - Hemiparesis, hemisensory loss, cortical signs
  - ACA – Hemiparesis (Leg > Arm), no/mild sensory deficit, frontal lobe signs

- **Posterior circulation – vertebrobasilar**
  - PICA/AICA/PCA – Cranial nerve and long tract signs, N+V, diplopia, Vertigo, ataxia, coma
1: Penetrating vessel disease
1: Penetrating vessel disease

Lacunar stroke

1. Pure hemiparesis
2. Hemisensory loss
3. Ataxic Hemiparesis
4. Clumsy hand – dysarthria syndrome

Absence of cortical features
2: Large vessel - MCA
2: Large vessel - MCA

MCA stroke

- Hemiparesis
- Hemisensory loss
- Visual field defect
- Cortical signs
  - Dysphasia
  - Neglect
3: Large vessel - PCA
3: Large vessel - PCA

Nausea + Vomiting
Diplopia
Vertigo
Ataxia
‘Crossed’ signs
Visual field defect
Coma
Diagnosis – Mechanism Why?

- **TOAST classification:**
  - Lacunar (penetrating vessel occlusion)
  - Large vessel occlusion
  - Cardioembolic (eg AF)
  - Other (eg sickle cell disease)
  - Undetermined

- **Haemorrhage**
Investigations

- FBC
- U+E
- Sugar
- Cholesterol
- ECG / Echo
- CXR
- Neuroimaging – CT, MRI, DWI, Perfusion
- Vascular imaging – CTA, MRA
Investigations

• Help to answer questions
  – Where? What? Why?

• For example: which side/arterial territory?
  infarction/haemorrhage?
  lacunar or large vessel?
  cardioembolic?

• In other words: how best to treat?
Summary

- **Stroke is a clinical syndrome NOT a diagnosis**
  - Need then to answer
    - What is it?
    - Where is it?
    - Why did it happen?

- **Urgent assessment should establish**
  - Deficit
  - Risk factors + likely cause
  - Complications
  - Multidisciplinary team
ASSESSMENT OF STROKE PATIENTS: SUMMARY

History
Stroke clerking proforma
Identify risk factors
Pre-stroke function

Examination
Neurological assessment
Identify risk factors

Multidisciplinary
Nursing
Functional disability
Communication
Swallowing function
Movement disability
Nutritional risk

Clinical Investigations
Haematology/biochemistry
Urinalysis
ECG
CXR

Investigations to consider
CT scan
Carotid doppler
Echocardiography
MRI

ISCHAEMIC STROKE
HAEMORRHAGIC STROKE

MANAGEMENT
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