

Neurosurgery

1. In taking a history from a patient with a ring-enhancing lesion seen on CT, all of the following should be considered in your differential diagnosis EXCEPT:
 - a) Breast cancer metastasis
 - b) Meningioma
 - c) Glioblastoma
 - d) Infarct
 - e) Cerebral abscess
2. A 75 year old man is brought to your office by his daughter, who is his primary caregiver. She describes a gradual decline in her father's gait over the last two months. She now describes his feet as being 'glued' or 'magnetized' to the floor. He also has a worsening dementia and has recently become incontinent of urine. Assuming this patient has had no prior investigations, which of the following is the most appropriate next step in his management:
 - a) Lumbar puncture
 - b) Routine bloodwork (CBC, lytes, BUN, Cr)
 - c) Urinalysis
 - d) CT or MRI of the head
 - e) Carotid dopplers
3. A 40 year old lady is hospitalized for treatment of a severe, bilateral pneumonia with parapneumonic pleural effusions. Two days into her stay, she develops a severe headache, then has a seizure overnight. She has no prior history of epilepsy. What is your most likely diagnosis:
 - a) Stroke
 - b) Cerebral abscess
 - c) Bacterial endocarditis
 - d) Migraine
 - e) Toxoplasmosis secondary to HIV/AIDS
4. Which of the following is not true concerning Brown-Sequard syndrome?
 - a) Contralateral spinothalamic deficits
 - b) Ipsilateral spinothalamic deficits
 - c) Ipsilateral dorsal column deficits
 - d) Ipsilateral pyramidal tract deficits
5. A 52-year-old man presented to the urgent care centre 2 weeks ago with severe left shoulder pain. He was diagnosed with bursitis and treated with NSAIDs. The pain has gradually improved, but the patient has scheduled an office visit because he is concerned about weakness of the left arm. On examination, the patient has full passive range of motion of the arm and shoulder without pain. Marked atrophy and weakness are noted in the left deltoid and shoulder girdle muscles. Biceps and triceps reflexes are absent. The remainder of the examination is unremarkable. Which of the following is the most likely diagnosis for this patient?
 - a) Thoracic outlet syndrome
 - b) Brachial plexitis (Parsonage-Turner syndrome)
 - c) Rotator cuff tear
 - d) Spinal cord tumour
 - e) Lacunar infarction

6) A 24-year-old man is brought to the emergency department by the emergency medical service (EMS). He suffered head trauma 20 minutes ago while playing football. Immediately after the event, he lost consciousness for 3 minutes and then woke up mildly confused. He complains of a moderate frontal headache. On physical examination, the patient's vital signs are stable, his Glasgow Coma Scale (GCS) score is 15, and he has no focal signs on neurologic examination. What interventions would be appropriate in the treatment of this patient?

- a) Continue with observation and repeat neurologic examinations; repeat assessment with the GCS periodically; and consider imaging with a CT scan to rule out contusions
- b) Continue with observation and repeated neurologic examinations; repeat assessment with the GCS periodically; and obtain an MRI
- c) Admit the patient for prolonged observation; obtain a CT scan to rule out contusions; and start I.V. mannitol for brain edema
- d) Admit the patient to the ICU; obtain an MRI; and consider intraventricular monitoring of intracranial pressure (ICP)

7) A 46-year-old woman is brought to the emergency department by EMS after being involved in a car accident. She was a passenger in the back seat of the car. The accident involved frontal impact, with the car moving at 50 mph. The patient was not wearing a seatbelt. The driver says she has not been awake since the accident, which occurred 30 minutes ago. On admission, the patient's vital signs are as follows: blood pressure, 100/60 mm Hg; heart rate, 78 beats/min; respiratory rate, 8 breaths/min; GCS score, 7. CT scan shows a frontal epidural hematoma with mass effect. How would you treat this patient?

- a) Intubate the patient, administer hyperventilation to a carbon dioxide tension (PCO_2) of 25 to 35 mm Hg, induce a barbiturate coma, and admit the patient to the ICU for further evaluation
- b) Intubate the patient, administer hyperventilation to a PCO_2 of 25 to 35 mm Hg, and ask for emergent neurosurgery consult for evacuation of the hematoma
- c) Intubate the patient, administer hyperventilation to a PCO_2 of 25 to 35 mm Hg, admit to ICU for close observation, and consult neurosurgery for intraventricular ICP monitoring
- d) Admit to ICU for further evaluation and start mannitol and steroids

- 8) A 22-year-old man is transferred to your hospital from a local hospital, where he presented 3 hours ago with closed head trauma. He lost consciousness for 10 minutes. At the first hospital where he was taken, he was given pain medications, and a CT scan was performed; the CT scan was negative. The patient is awake and complains only of moderate headache. His physical examination is unremarkable. The family is concerned about the development of seizures in the future, because they had a relative who had that problem. What would you recommend regarding prophylaxis for seizures in this patient?
- Phenytoin for 1 to 2 weeks
 - Carbamazepine for 6 months
 - Obtain an electroencephalogram; if it is abnormal, start phenytoin
 - Do not start any antiseizure medication at this time
- 9) A 65 year-old gentleman originally hospitalized for work-up and treatment of a subarachnoid hemorrhage is initially found to have no focal neurological deficits. Six days after being hospitalized, you are called to his bedside by his nurse as he has become increasingly lethargic, confused, and has new focal weakness. What is the likely cause of his deterioration?
- Intra-cerebral hemorrhage
 - Re-ruptured aneurysm
 - Pneumonia
 - Vasospasm
 - Intra-ventricular hemorrhage
- 10) In a patient that has been hospitalized for a subarachnoid hemorrhage, what is the appropriate pharmacological prevention for vasospasm?
- Metoprolol
 - LMWH
 - Triple H Therapy
 - b & c
 - Nimodipine
- 11) In a patient that has been hospitalized for subarachnoid hemorrhage with evidence of vasospasm, which of the following are appropriate treatment?
- Triple H Therapy
 - Nimodipine
 - Angioplasty
 - a & c
 - a, b & c
- 12) Which of the following is not a classic sign of a basal skull fracture?
- Battle sign
 - Raccoon eyes
 - Hemotympanum
 - Freedman sign
 - CSF rhinorrhea/otorrhea
- 13) A 19 year-old female with a traumatic head injury is brought to the ED by EMS. She is hemodynamically stable but requires assisted ventilation through an endotracheal tube. She does not open her eyes to painful stimuli and maintains an abnormal extension posture. Which of the following is incorrect?
- Her GCS is 3T
 - A GCS of 8 is an indication for intubation
 - Isolated head injuries can cause shock
 - She should be ventilated to a pCO₂ of 30-35 mm Hg
 - All are incorrect
- 14) A 52 year-old dentist comes to your office complaining of severe bilateral buttock cramps and thigh fatigue during a tennis match and recent onset of impotence. The most likely diagnosis is:
- Lumbosacral disc problem
 - Multiple sclerosis
 - Leriche syndrome
 - Metastatic carcinoma of the spine

- 15) A young woman who was involved in a cliff diving accident is brought into the emergency department unresponsive to deep pain with a right pupil that is dilated and non-reactive. The left pupil is normal. The most appropriate initial treatment is:
- Endotracheal intubation
 - CT scan of the head
 - 500 cc normal saline IV
 - IV steroids
 - IV mannitol
- 16) A 78 year-old woman complains of experiencing headaches and progressive confusion for the last month. She has a left hemianopia and cannot dress herself. A CT scan demonstrates a large, irregularly enhancing mass in the right parietal lobe. There is no obvious systemic disease. The most likely diagnosis is:
- Brain abscess
 - Glioblastoma multiforme
 - Meningioma
 - Metastasis
 - CNS lymphoma
- 17) A patient with a subarachnoid hemorrhage (SAH) caused by a right anterior communicating artery aneurysm undergoes successful surgery 2 days after the hemorrhage. Three days later, right arm weakness develops. The most likely diagnosis is:
- Hydrocephalus
 - Meningitis
 - Repeat hemorrhage
 - Vasospasm
 - None of the above
- 18) A 60 year-old man presents with back and leg pain and trouble urinating. On examination, he has decreased sensation over the buttocks, normal motor power, and absent ankle jerks bilaterally. How would this patient best be investigated?
- Plain films of the lumbar spine
 - CT of lumbar spine
 - MRI of spine
 - Investigate only if no improvement after 6 weeks of symptomatic treatment
 - Gallium scan of the spine
- 19) A 72 year-old man on physical examination is found to have expressive dysphasia and mild right arm weakness. The most probable location of his lesion is:
- Right parietal lobe
 - Left frontal lobe
 - Right frontal lobe
 - Left parietal lobe
 - Basal ganglia
- 20) Initial management of any patient with coma of undetermined cause includes all EXCEPT:
- Clear and secure the airway
 - Naloxone
 - D50W 50 mL IV
 - Dexamethasone 16 mg IV
 - Thiamine
- 21) A 53 year-old male presents to the ED with new onset of a severe headache associated with nausea and vomiting. There is no history of trauma. He is alert and oriented with no neck stiffness. Anisocoria is present. The most likely diagnosis is:
- Intracranial bleed
 - Cluster headache
 - Meningitis
 - Migraine headache
 - Tension headache
- 22) A 24 year-old woman arrives at the Emergency Department unconscious. Her BP is 90/60, her heart rate is 60 bpm, she is breathing at 8 breaths per minute and her O2 sat is 86%. Her eyes remain closed even after pain stimulation and the only sounds she makes are incomprehensible. Her elbows and wrists are flexed with her feet extended. This patient's GCS score is:
- 3
 - 4
 - 5
 - 6
 - 7

- 23) Which physical exam finding below is usually not associated with increasing intracranial pressure?
- Deteriorating level of consciousness
 - Increasing heart rate
 - Increasing blood pressure
 - Yawning, hiccupping, vomiting
 - Unilateral sixth cranial nerve palsy
- 24) A 19 year-old woman is brought to the emergency room following involvement in a motor vehicle accident. On examination, she has a GCS of 10 and swelling over the occipital protuberance. The most appropriate imaging study is:
- MRI of skull and contents
 - Skull films
 - Head CT
 - Cerebral angiogram
 - CT myelogram
- 25) An 80 year-old woman suffers cervical spinal soft-tissue injury in a motor vehicle accident with no skeletal or neurologic damage documented at the time. Three months later, she presents with sudden onset of homonymous right upper quadrantanopia. CT demonstrates a non-hemorrhagic lesion in the left lower occipital lobe. Which imaging study would likely yield the most useful information?
- Carotid Doppler ultrasound
 - Echocardiography
 - MR angiography
 - SPECT scan
 - C-spine plain films
- 26) A neurosurgeon complains of a 3 week history of awakening at night with right-hand discomfort that resolves after several minutes. On examination, he has mild weakness of thumb abduction and diminished pain sensibility on the palmar aspect of the thumb and index finger. The most likely diagnosis is:
- Carpal tunnel syndrome
 - Cervical radiculopathy
 - Reflex sympathetic dystrophy
 - Tendonitis
 - Left middle cerebral artery ischemic attacks
- 27) A 73 year-old woman presents with a 6 month history of deteriorating gait and low back discomfort, exacerbated by walking. Examination is unremarkable except for hypoactive muscle stretch reflexes in the legs. X-rays of the lumbosacral area shows the expected degenerative changes associated with a woman of her age. The most likely diagnosis is:
- Acute lumbar disc herniation
 - Lumbar stenosis
 - Myopathy
 - Normal pressure hydrocephalus
 - Cervical stenosis
- 28) L4/L5 disc prolapse. What is observed?
- Loss of ankle-jerk reflex
 - Numbness on the lateral side of the foot
 - Positive femoral nerve stretch test
 - Weak quadriceps
 - Foot drop

ANSWERS

1. B
2. D
3. B
4. B
5. B
6. A

7. B
8. D
9. D
10. E
11. D
12. D

13. C
14. C
15. A
16. B
17. D
18. C

19. B
20. D
21. A
22. D
23. B
24. C

25. C
26. A
27. B
28. E