Clinical Quiz in Emergency Medicine

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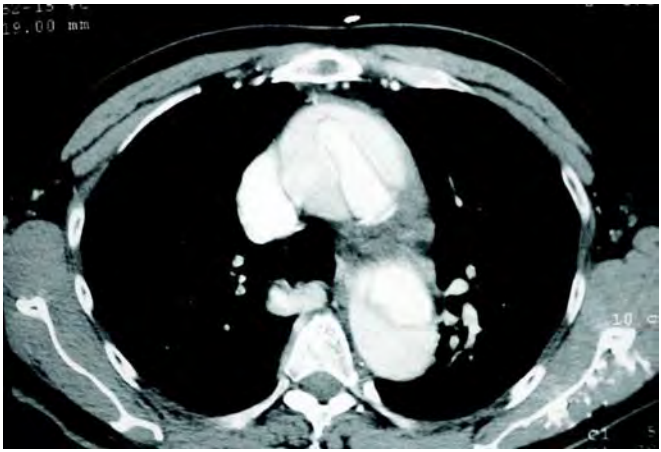
A 60-year-old man with severe interscapular back pain

A 60-year-old man presented to ED because of sudden onset of severe interscapular back pain that he had experienced for one hour. A CXR revealed a widened mediastinum. An urgent CT thorax was performed.



QUESTIONS

1. What are the CT findings?
2. What is the diagnosis?
3. What might the CXR show (in addition to widened mediastinum)?
4. What are two classifications of the above diagnosis?

ANSWERS

1. There is an intimal flap separating the true lumen and false lumen. Both ascending and descending aorta are involved. The true lumen is markedly narrow and is close to the inner

curvature of the aortic arch. The false lumen is usually larger. The presence of beak sign (acute angle between the dissected flap and the outer wall) and cobweb sign (thin strands crossing the lumen) are suggestive of false lumen.

2. The diagnosis is aortic dissection. Thoracic aortic dissection is the most frequent cause of aortic emergency. It occurs more frequently in those with hypertension, bicuspid aortic valve, Marfan's syndrome or Ehler-Danlos syndrome. Sensitivity and specificity of MDCT is nearly 100%. CT scan also depicts other pathological entities with similar clinical manifestation such as intramural haematoma (best shown in the noncontrast CT) and penetrating atherosclerotic ulcer.

3. CXR may show a double knuckle aorta, left pleural effusion, deviation of the trachea/nasogastric tube to the right and the "calcium" sign. The calcium sign is the separation of the two parts of the wall of a calcified aorta by > 5 mm.

4. Aorta dissection can be classified by the DeBakey or Stanford classifications. DeBakey type I dissections are those that involve the ascending aorta, the arch and the descending aorta. Type II involves only the ascending aorta, and type III involves only the descending aorta.

   Stanford type A aortic dissection involves the ascending aorta. Type B involves only the descending aorta. In general, type A dissection requires surgical repair, and type B dissection is treated medically unless complications occur.

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A 16-year-old boy with left eye injury

A 16-year-old boy presented to ED because his left eye had been hit by another player's elbow during a basketball game. An X-ray of the face was taken.

QUESTIONS

1. What is the name of this X-ray view?
2. What is the X-ray finding?
3. What is the diagnosis?
4. What are two theories on the mechanism of the above diagnosis?
5. What physical examinations should be done?

ANSWERS

1. This is the occipitomental (Waters) view, which is useful to evaluate most midface fractures.

2. There is left orbital emphysema (intraorbital air) or black eyebrow sign, which is diagnostic of a fracture through one of the adjacent sinuses. Surgical emphysema may present in examination. There was no maxillary sinus air-fluid level or opacification. There was no tear drop sign (soft tissue mass in the roof of the maxillary sinus).

3. The diagnosis is orbital blowout fracture. In our patient, coronal CT orbit was performed and fracture of the medial orbital wall was confirmed (white arrow).

4. The first mechanism is the increased intraorbital hydraulic pressure causing fracture of the orbital floor (more common) or medial wall of the orbit. The second mechanism is the buckling force from the orbital rim.

5. Orbital blowout fracture frequently is associated with eye injury. The emergency physician should check the eye for diplopia (entrapment of the inferior rectus muscle in fracture of the orbital floor), hyphaema, visual acuity,

enophthalmos and retinal detachment. Infraorbital nerve anaesthesia should be documented. The patient should be referred to the maxillofacial surgeon and ophthalmologist for further assessment. The patient should be informed not to blow his nose.

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A 68-year-old woman with drooling of saliva and left ear pain

A 68-year-old woman presented to ED with drooling of saliva and left ear pain that she had experienced for two days.

QUESTIONS

1. What are the findings in the clinical photograph?
2. What other possible symptoms may the patient present?
3. What are the possible causes of the above findings?
4. What is the ED treatment?

ANSWERS

1. The patient has left lower motor neurone facial nerve palsy

involving the entire left face. There is no forehead sparing. Emergency physicians need to differentiate between an upper and lower motor neurone lesion of the facial nerve. A lower motor neurone lesion occurs with Bell's palsy, whereas an upper motor neurone lesion is associated with a cerebrovascular accident.

2. Possible symptoms include hyperacusis (involvement of nerve to stapedius) and loss of sensation of anterior two-thirds of the left side of the tongue (involvement of chorda tympani nerve).

3. The possible causes of lower motor neurone facial nerve palsy include the following:

- temporal bone fracture
- parotid tumour
- middle ear infection or pathology (e.g. cholesteatoma)
- acoustics neuroma, usually with evidence of other nerve involvement (V, VI, VIII nerves) at the cerebello-pontine angle
- Ramsay Hunt syndrome
- idiopathic Bell's palsy (commonest cause)

Our patient had a vesicle over the left ear as shown, and she was diagnosed as having Ramsay Hunt syndrome. This is due to herpes zoster infection of the geniculate ganglion. Cranial nerves V, VIII, IX and X may also be affected. Patients also may complain of hearing loss and vertigo. In addition to vesicle eruptions being over the ear, they may be found on the tongue, palate, mastoid process and neck. Recovery of facial nerve function is much less likely than in Bell's palsy.

4. Treatment consists of analgesics, acyclovir, prednisolone and appropriate eye care. Consider taping the eye closed during sleep. Patients should be referred to an ENT specialist for follow up.

REFERENCE

1. Birinyi F. Facial weakness and rash. Ramsay Hunt syndrome (herpes zoster cephalicus, herpes zoster oticus, herpes zoster auricularis). *Acad Emerg Med* 1996;3:1144–5, 1153–5.

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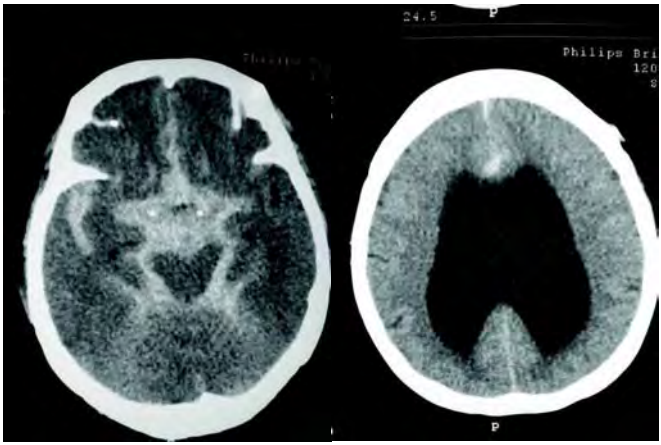
A 62-year-old woman with dizziness and severe headache

A 62-year-old woman complainings of dizziness and severe headache presented to ED. She was unconscious on arrival. Her BP was 244/127 mmHg and pulse was 62/min. A GCS was E1V2M4. An urgent CT scan of brain was performed.



QUESTIONS

1. What are the CT scan findings?
2. What is the clinical diagnosis?
3. What is the most likely cause of the above condition? Where are common sites?
4. What is name of the grading system for the above condition? What is the grading of this patient?
5. What are common complications?

ANSWERS

1. There is blood in the sulci on the sylvian fissures bilaterally and the basal cistern. There is marked obstructive hydrocephalus in the second CT image.
2. The clinical diagnosis is acute subarachnoid haemorrhage with marked hydrocephalus.
3. The most likely cause of subarachnoid haemorrhage is rupture berry aneurysm (90%). Common sites are at the points of bifurcation of the anterior communicating artery, posterior communicating artery, middle cerebral artery and terminal internal carotid artery. Another cause is arterio-venous malformation.
4. The grading system is the Hunt and Hess scale. The patient had grade IV or V. The prognosis is best in grade I (mortality 5%) and worst in grade V (mortality 50–70%).
5. Common complications include the following:

- obstructive hydrocephalus from haematoma in the aqueduct
- vasospasm at one week producing brain infarction
- rebleeding at two weeks

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2. Suarez JI, Tarr RW, Selman WR. Aneurysmal subarachnoid hemorrhage. *New Engl J Med* 2006;354:387–96.

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An 11-year-old girl with left knee injury

An 11-year-old girl fell down and injured her left knee during a hurdles race. She was unable to move her left leg immediately after the injury. She presented to ED and an X-ray of the left knee was taken.

QUESTIONS

1. What are the X-ray and clinical findings?
2. What important mechanism needs to be checked during the physical examination?
3. What are the components of the above mechanism?
4. What should be the treatment?
5. What is Osgood-Schlatter's disease?

ANSWERS

1. There are abrasions over the left knee region, a grossly swollen left knee joint and swelling over the left upper leg region. The X-ray reveals a displaced fracture of the tibial tuberosity. The mechanism of injury is indirect. A sudden flexion force is applied to a flexed knee joint with the quadriceps tightly contracted. The tightly contracted quadriceps resists this force and avulses the tibial tubercle.
2. The extensors mechanism of the knee should be checked.
3. Extensor mechanisms of the knee include the following:
   - quadriceps muscle
   - quadriceps tendon
   - patella
   - patella tendon
   - tibial tubercle
4. The patient should be admitted to the orthopaedic ward for open reduction and internal fixation.
5. Osgood-Schlatter's disease is traction apophysis of tibial attachment of the patella tendon that occurs in active adolescents (10–15 years, M > F). Anterior knee pain after exercise is characteristic. The tibial tuberosity is prominent and tender. An X-ray may show an enlarged and sometimes fragmented tibial tuberosity. Treatment is rest and analgesia.

REFERENCE

1. Hand WL, Hand CR, Dunn AW. Avulsion fractures of the tibial tubercle. *J Bone Joint Surg* 1971;53:1579–83.

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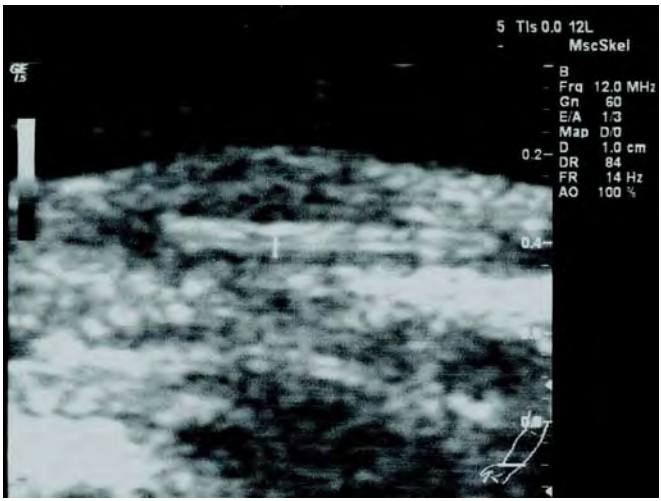
A 40-year-old woman with persistent wound pain

A 40-year-old woman presented to ED because of persistent pain and redness around her left forearm that she had experienced for one week. She had a history of a pricking injury by a wooden object on her wrist one week earlier. An X-ray of that last ED attendance was normal. A bedside USG was performed at this second visit.



QUESTIONS

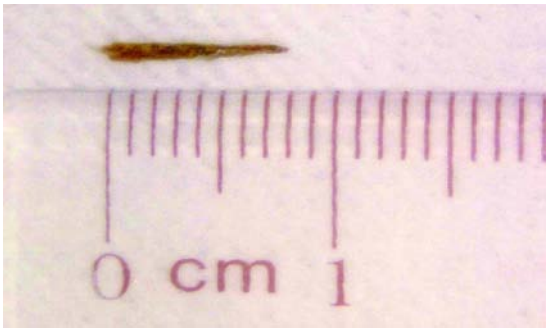
1. What is the clinical diagnosis?
2. What technique should be used in the bedside USG examination in this case?
3. What are the USG findings?

ANSWERS

1. With a history of pricking injury, retained foreign body leading to persistent infection should be suspected.
2. A linear high frequency 7.5–15 MHz probe should be used to localize a subcutaneous foreign body. A higher frequency transducer offers the ability to delineate the small foreign body. A load of ultrasound jelly or a commercial jelly pad (acoustic standoff pad) could be used to space out the distance between the probe and the contact surface, allowing an improved object focus. It allows the skin and superficial subcutaneous tissues to be moved well away from the transducers near field "dead zone".
3. There is a hyperechoic linear foreign body that is surrounded by a hypoechoic margin. An acoustic shadow is behind the hyperechoic foreign body.

OUTCOME

The patient had an exploration and removal of the foreign body under the guidance of USG. A wooden object (0.8 cm in length) was finally removed. She made an uneventful recovery.



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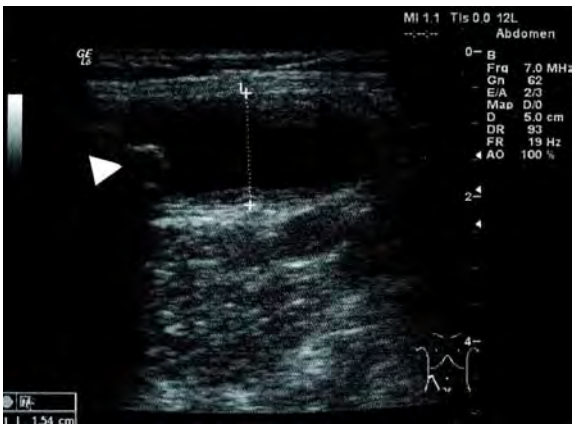
A 30-year-old woman with right-sided abdominal pain

A 30-year-old woman presented to ED because of having right-sided abdominal pain for one day. An AXR was taken and an abdominal USG was performed.



QUESTIONS

1. What are the AXR findings?
2. What are the USG findings, including the echogenic shadow? What is one likely finding in this case that does not show on this single static image?
3. What are the traditional physical signs possibly detected in her?
4. What are the components of the arrow pointed USG shadow?
5. If the patient recurs with the same diagnosis, what rare inadequate surgical treatment could account for this?

ANSWERS

1. There is an opacity and localized ileus in the right lower quadrant.
2. The USG findings are distended appendix (diameter > 6 mm) and appendicolith (brightly echogenic and produce acoustic shadowing). The appendix is likely noncompressible.
3. Traditional physical signs are
   Rovsing's sign, Blumberg's sign, Cope's sign (Obturator test), psoas sign and straight leg raising sign.
4. Components of appendicolith include fecal matter, calcium phosphate, bacteria and epithelial debris.
5. There could have been a remaining appendix stump.

REFERENCE

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