JCM OSCE 2-10-2019

Queen Elizabeth Hospital

- A 30-year old lady was assaulted by a sharp knife into her right upper back and shoulder by a stranger in street.
- Pre-hospital blood pressure was 60/40, radial pulse was weak.
- On arrival to AED, her vital signs were BP 95/38, Pulse rate 143, GCS E3V5M6.
- Her upper back wound has active blood splashing out. Chest X-ray was taken after initial resuscitation.





- Describe 4 findings from the X-ray (2 marks)
- What is the clinical diagnosis which best describes the external wound AND the CXR finding? (1 mark)
- What is the indication for surgical intervention with reference to output of chest drain? (1 mark)
- What is the size of chest drain recommended in this condition according to current ATLS guideline? (1 mark)
- Name 2 muscles in the anatomy of the 'safety triangle' to guide the chest drain insertion (2 marks)

She has received unmatched blood transfusion whilst massive transfusion protocol(MTP) was activated during resuscitation.

- What is the ratio for the amounts of the different components of blood & blood products in MTP (1 point)
- Name two scoring systems which can help dictate activation of MTP. (2 marks)



- Describe 4 findings from the X-ray. (2 marks)
 - Right pneumothorax (0.5), Right lung pleural effusion/consolidation/hemothorax (0.5), 2 chest drains (0.5), ETT (0.5), surgical emphysema (0.5)
- What is the clinical diagnosis which best describes the external wound AND the CXR finding? (1 mark)
 - <u>Open</u> right haemo-pneumothorax
- What is the indication for surgical intervention with reference to output of chest drain? (1 mark)
 - Massive Hemothorax (variable definition, >1 or 1.5L blood loss, or 200ml/hr)
- What is the size of chest drain recommended in this condition according to current ATLS guideline? (1 mark)
 - 28 32 Fr

Clip slide

Thoracic Trauma

Life Threatening Injuries

- Flail chest out
- Tracheobronchial injury now in

Tension pneumothorax

- Needle thoracocentesis
 - 5th ICS MAL for adult
 - UNCHANGED 2nd ICS for child
- 28-32 Fr chest drain for hemothorax (not 36-40 Fr)
- Algorithm for circulatory arrest approach
- Aortic rupture management with Beta Blocker
- Trauma team

- Name 2 muscles in the anatomy of the 'dangerous triangle' to guide the chest drain insertion (2 marks)
 - Pectoralis major; latissimus dorsi

She has received unmatched blood transfusion whilst massive transfusion protocol(MTP) was activated during resuscitation.

- What is the ratio for the amounts of the different components of blood & blood products in MTP (1 point)
 - 1:1:1 or 2:1:1 (Packed cells; platelet concentrate; Fresh frozen Plasma)
- Name two scoring systems which can help dictate activation of MTP. (2 marks)
 - Prince of Wales Hospital (PWH) score
 - Assessment of Blood Consumption (ABC) score
 - Trauma-Associated Severe Hemorrhage (TASH) score
 - Emergency Transfusion Score (ETS)





 $SBP \le 90$ +1 $HR \ge 120$ +1 + FAST +1 PENETRATING +1 TORSO INJURY

ABC SCORE

SCORE < 2 SUGGESTS UNLIKEDY NEED FOR MASSIVE TRANSPUSION



• A citizen was hit by a high speed tennis ball into his right eye. Here is his clinical photo.



- List out two clinical findings from the picture.(2 marks)
- What clinical test can you do to rule out ruptured globe? (1 mark)
- This injury may provoke increased intraocular pressure. What is this condition called? (1 mark)
- Name 2 pathological mechanisms for possible elevated Increased Intraocular pressure (IOP) in this patient (2 marks)
- How would you advise positioning of this patient (1 mark)
- Would you recommend any eye pad to his injured eye? (0.5 mark)
 Why?(0.5 mark)
- Your patient is in severe pain. What topical medications would you consider to relieve / reduce the pain (2 marks)

- What does the picture show? (2 marks)
 - Hyphema, conjunctival injection
- What clinical test can you do to rule out ruptured globe? (1 mark)
 - Seidel's test (anterior chamber leakage)
- This injury may provoke increased intraocular pressure. What is this condition called? (1 mark)
 - Traumatic iritis with elevated IOP







- Name 2 pathological mechanisms for possible elevated Increased Intraocular pressure (IOP) in this patient (2 marks)
 - open angle e.g. angle recession, hyphema
 - closed angle e.g. swollen lens
- How would you advise positioning of this patient (1 mark)
 - Upright
- Would you recommend any eye pad to his injured eye? (0.5 mark) and why? (0.5 mark)
 - No, will give pressure to the eye (should put on eyeshield)
- Your patient is in severe pain. What topical analgesics would you consider to relieve / reduce the pain (2 marks)
 - topical amethocaine
 - Topical cycloplegics (cyclopentolate 1%, atropine, tropicamide) (for those without narrow angle)



- A youngster was attacked by two other men inside a tunnel.
- He suffered from left arm injury with pain, swelling and deformity.
- Here is his arm X-ray.



- Name 2 X-ray findings (3 marks)
- Name a common mechanism leading to such injury (1 mark)
- What nerve is in danger? (1 mark)
- Name the muscles which may possibly be involved due to the nerve palsy at this level (3 marks)
- What is the sensory area in hand this nerve supplies to ? (1 mark)
- What is the definitive treatment for this condition? (1 mark)

- Name 2 X-ray findings. (3 marks)
 - <u>Spiral fracture</u> of <u>mid shaft of left humerus (2 marks)</u>; also cortical break of neck of humerus (1 mark)
- Name a common mechanism leading to such injury (1 mark)
 - <u>twisting</u> (indirectly due to fall, direct <u>twisting</u> e.g. arm wrestling, assault)
- What nerve is in danger? (1 mark)
 - Radial nerve

Name the muscles which may possibly be involved due to the nerve palsy at this level (3 marks)



- What is the sensory area in hand this nerve supplies to ? (1 mark)
 - 1st web space (dorsum)
- What is the definitive treatment for this condition? (1 mark)
 - ORIF

NERVE LESIONS IN THE UPPER LIMB - 4

RADIAL IN SPIRAL GROOVE

Aetiology: fracture mid shaft humerus, Saturday night palsy, injections

Muscle loss: extensors of wrist and fingers, but triceps & anconeus are spared

Movement loss: extensor weakness wrist, metacarpophalangeal joints. Interphalangeal joints are alright because of intact interossei & lumbricals

Result: wrist drop and inability to grip. Extension of elbow is alright

Sensory loss: over 1st dorsal interosseous, lower lateral cutaneous nerve of arm is usually alright

Test: power of wrist extension



WRIST DROP

 This is the photo of left forearm of your patient after close contact of a tear gas canister.



- Describe the clinical finding. (1 mark)
- What pre-hospital procedure can be done at scene? (1mark) and why? (1 mark)
- What are the proposed mechanisms for causing the condition in the clinical photo? (2 marks)
- What is the major component of tear gas? (1 mark)
- How many levels of personal protective equipment commonly used in dealing with HAZMAT patients? (1 mark)
- What should be the appropriate level of PPE in this scenario? (1 mark)
- Would you like to puncture those lesions (1 mark) and why? (1 mark)

- Describe the clinical finding. (1 mark)
 - Multiple blisters over forearm.
- What pre-hospital procedure can be done at scene? (1mark) and why? (1 mark)
 - (surface) Decontamination
 - to reduce chemical (and heat) exposure ASAP
- What are the proposed mechanisms for causing the condition in the clinical photo? (2 marks)
 - Chemical burn
 - Thermal burn
- What is the major component of tear gas? (1 mark)
 - CS

Table 1 A comparison of the estimated human toxicity of CN, CS and OC ^{2 9 96}				
	CN	CS	ОС	
Threshold for eye irritation (mg/m ³)	1.0	0.004	0.002	
Effective concentration—ICt ₅₀ (mg/min/m ³)	20–50	4–20	-	
Estimated lethal dose—LCt ₅₀ (mg/min/m ³)	8500-25 000	25 000-100 000	>100 000	

CN, 2-chloroacetophenone; CS, o-chlorobenzylidene malonitrile; OC, oleoresin capsicum.



 How many levels of personal protective equipment commonly used in dealing with HAZMAT patients? (1 mark)

• 4

- What should be the appropriate level of PPE in this sceanrio? (1 mark)
 - Level C
- Would you like to puncture those lesions (1 mark) and why? (1 mark)
 - Yes to facilitate subsequent home management
 - No risk of introducing infection

SCBA + hooded chemical resistant clothing + face shield



Level C PPE includes

- full-face air purifying respirators (APR)
- inner and outer chemical-resistant gloves;
- hard hat;
- escape mask; and disposable chemical-resistant outer boots.

 A 42 year old young man presented with syncope to your ED. His vital signs are as follows : BP 136/72 P 82 SpO2 98% RA Temp 36.2 GCS 15. Here is his ECG.



- Describe an important ECG feature that could have led to his syncope (1 mark)
- What is the syndrome? (1 mark)
- Name the pathomechanism. (1 mark)
- Name three clinical criteria in order to make the above diagnosis with this ECG. (3 marks)
- Name two provocation factors. (2 marks)
- What is the definite treatment? (1 mark)
- Give two differential diagnoses with similar ECG (0.5 marks each)

- Describe an ECG feature that could have led to his syncope (1 mark)
 - Coved ST elevation in V1-V3 (or Brugada sign)
- What is the syndrome? (1 mark)
 - Brugada syndrome (by Brugada brothers at 1992)
 - (SCN5A, 50% spontaneous mutations, AD inheritance)
- Name the pathomechanism. (1 mark)
 - sodium channelopathy





Brugada syndrome

- Name three more clinical criteria. (3 marks)
 - Documented ventricular fibrillation (VF) or polymorphic ventricular tachycardia (VT)
 - Family history of sudden cardiac death at <45 years old
 - Coved-type ECGs in family members.
 - Inducibility of VT with programmed electrical stimulation
 - Syncope.
 - Nocturnal agonal respiration
- Name two provocation factors. (2 marks)
 - fever, ischemia, hypoKalemia, hypothermia, Drugs

What is the definite treatment? (1 mark)

• Implantable cardioverter defibrillator (ICD) insertion

Give two differential diagnoses with similar ECG (0.5 marks each):

- Atypical RBBB
- ARVD (Arrhythmogenic right ventricular dysplasia)
- Early repolarization
- Acute pericarditis
- AMI
- LVH

 This is the clinical photo and X-ray of the lower limb of your patient after chopping injury.

Left Knee



Name 2 muscles in danger with this injury (2 mark)



- If patient also has fracture like the above X-ray, which classification is commonly used to grade this kind of injury? (1 mark) what is the grading according to such classification? (1 mark)
- What antibiotics should we give and why? (2 mark)
- Name 4 other management in ED. (4 marks)

- Which muscle/tendon is at risk? (2 mark)
 - Tibialis anterior
 - Extensor digitorum longus



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- If patient also has fracture like the above X-ray, which classification is commonly used to grade such injury? Gustilo-Anderson classification (1 mark)
- what is the grading according to such classification? at least grade II (1 mark)
- What antibiotics should we give and what is the coverage? (2 mark)
 - 1st Gen Cephalosporin
 e.g. cefazolin 1g (also compatible with IMPACT v5)
 Gustilo-Anderson classification of open fractures and antibiotic recommendations
 - Gram+ cocci
 - (also accept augmentin or rocephin or ampicillin + cloxacillin

Classification	Criteria	Description	Antibiotics ^a
Gustilo I	Wound <1 cm No contamination Simple fracture No periosteal stripping	Local skin coverage No neurovascular injury Low energy No soft tissue damage	First-generation cephalosporin for 24 h after closure
Gustilo II	Wound >1 cm Moderate contamination Moderate comminution No periosteal stripping	Local skin coverage No neurovascular injury Moderate energy No extensive soft tissue damage	First-generation cephalosporin for 24 h after closure
Gustilo III	and the construction of the state of the sta		lense Careksin adi panan karah 200 mayadi y
IIIA	Large injury zone Extensive contamination Severe comminution or segmental fracture Periosteal stripping	Local skin coverage No neurovascular injury High energy Extensive soft tissue damage	First-generation cephalosporin and aminoglycoside (gram- negative) for 24–72 h after debridement
IIIB	Large injury zone Extensive contamination Severe comminution or segmental fracture Periosteal stripping	Requires soft tissue coverage (flap) No neurovascular injury High energy Extensive soft tissue damage	First-generation cephalosporin and aminoglycoside (gram- negative) for 24–72 h after debridement
IIIC	Large injury zone Extensive contamination Severe comminution or segmental fracture Periosteal stripping	Local skin coverage Neurovascular injury requiring arterial repair High energy Extensive soft tissue damage	First-generation cephalosporin and aminoglycoside (gram- negative) for 24–72 h after debridement

¹ Add high-dose penicillin if agricultural injury with anaerobic concern.

IMPACT Fifth Edition (version 5.0)

Type of operation	Indications	Recommended drugs ¹
Orthopaedic & Traumatology ²	 Total joint replacement with prosthesis Internal fixation of closed fractures 	 I.V. cefazolin 1 g³ OR I.V. cefuroxime 1.5 g <u>Note:</u> Antimicrobial agents should be completely infused before inflating the tourniquet if applied.
	 Prophylactic antibiotic is indicated for all open fractures and should be given as soon as possible⁵ Wound cultures and sensitivity testing are useful for informing subsequent choice of antimicrobials (493–495) For Gustilo type III tibial fractures, prophylaxis given within 1 hr was associated with reduced infection risk (496) 	 I.V. amoxicillin- clavulanate ± gentamicin⁵ OR I.V. ceftriaxone 2 g ± I.V. penicillin G⁵ OR other third generation cephalosporin ± I.V. penicillin G⁵ Note: The duration of prophylactic antibiotic for open fractures depends on the classification: 24 hr (for Gustilo type I and II open fractures) and up to 72 hr (for Gustilo type III open fractures). Antibiotics should not be given for more than 24 hr after soft tissue coverage of the wound, whichever occurs first.
Thyroid & parathyroid glands		 Antimicrobial prophylaxis is not indicated

- Name 4 other management in ED for this patient with open fracture. (4 marks)
 - Analgesics (Fentanyl/ morphine/ tramadol injections)
 - Anti-tetanus toxoid +/- Immunoglobulins
 - Remove gross determinants of the wound
 - Immobilize the limb with splintage

Thank you!

