AUSTRALIAN MARINE ENVENOMATION

BLUEBOTTLE JELLYFISH.

- Responsible for 1000's of stings each year on Australian beaches.
- Intense local pain & dermal erythema.
- Major systemic envenoming does *NOT* occur.

Clinically.

- Immediate burning pain [lasting up to 2 hours]
  - Linear or elliptical welts.
- Assoc. non-specific symptoms.
  - N&V
  - Headache
  - Malaise.

Management.

- Stings are mostly mild & self-limiting.
- Reassurance.
- Hot-shower (~20mins); *ideally 45*C.*
- Simple oral analgesia.
- AVOID.
  - Pressure immobilisation bandage
  - Vinegar.

No antivenom available.

Differential Dx.

- *Irukandji*: typically delayed pain (severe & generalised)
- *Box jellyfish:* Immediate pain (obvious large dermal markings).

STONEFISH.

- Extremely well camouflaged reef-fish of northern Australia.
- Dorsal-spines contain venom [injected w/ external pressure].

Toxin.

- Pre & post-synaptic neurotoxins plus vascular permeability factors, tissue-necrosis factors & vasodilators.
  - Some components are denatured by heat.

Clinically.

- Immediate, severe pain at sting site.
  - Local swelling, bruising. ?remnant of spine.
- Systemic envenoming is *rare.*
  - Non-specific symptoms: N&V, dizziness & dyspnoea.
- Cardiovascular signs (rarely reported).
  - Incl. hypotension, bradycardia, pulmonary oedema & cyanosis.

Management.

- Pre-hospital.
  - Reassurance & simple analgesia.

- Immersion of both limbs in *hot* water (unaffected limb ensures approp. temperature).
- Hospital.
  - Very painful --> rarely, life-threatening.
  - Continue hot-water treatment.
  - IV opiate analgesia
  - Consider regional anaesthesia.
  - Assess for retained FB (spine)
    - Consider empiric ABx for prevention of 2* infection.

Antivenom.
- Used for treatment of pain refractory to first aid & IV opiates.
- Indicated for systemic toxicity also.
- 1 ampoule [2000 units] per *two spine puncture wounds.*
  - Max = 3 ampoules.
  - Undiluted IM injection (or diluted to 100mL N.Saline, given IV).

BOX JELLYFISH.

- Found in tropical Australian waters.
- Most stings are benign & respond to supportive measures.
  - Severe envenomings can be fatal however.
- Deaths typically occur within 5 minutes of the sting.
  - ?direct cardiac toxicity.

Toxin.
- Cardiac toxin appears to affect calcium-channels (pore-forming).
- Assoc. haemolytic & dermatonecrotic components.

Clinically.
- Immediate severe pain (lasting up to 8 hours), linear welts ("crosshatched pattern")
  - 25-30% of cases have tentacles still attached.
- Systemic envenoming = collapse & sudden death within minutes of sting.
- CVS effects include hypertension, hypotension, tachycardia, impaired cardiac conduction & dysrhythmias.
- Delayed hypersensitivity can occur (7-14 days later).

Management.
- Pre-hospital.
  - Immediate & prolonged CPR for cardiac arrest.
  - First Aid: Ice-pack & simple analgesia
  - Vinegar ++ (to all visible bites) --> inactivates undischarged nematocysts.
  - No role of pressure-immobilisation bandage.
- Hospital.
  - Rarely a life-threatening emergency.
  - Patient to be managed in resuscitation area.
    - Potential life-threats include cardiac arrest, hypotension & dysrhythmias.
  - CARDIAC ARREST:

- Undiluted antivenom given IV push !
- All immediately available antivenom should be given (up to 6 ampoules).
- IV Magnesium (for arrest refractory to antivenom).

- Analgesia.
  - Titrated IV opiate.

Investigations.

- 12-lead ECG
- Other investigations to exclude differential diagnoses
- Check FBC, EUC, CK/Trop.
- CXR.

Antivenom.

- Definitive treatment for box-jellyfish envenoming.
- Give 6 ampoules (IV push) for cardiac arrest.
- Give 3 ampoules (diluted in 100mL N.Saline) over 20mins for systemic envenoming (collapse, hypotension, cardiac dysrhythmias).
  - Does can be re-given if symptoms persist.
- Give 1 ampoule for pain refractory to IV opiates.

IRUKANDJI SYNDROME.

- Distressing envenoming syndrome.
- Can result in life-threatening hypertension & pulmonary oedema.
  - Only two fatalities in Australia.
- Antivenom *yet to be developed.*

Toxin.

- Thought to induce massive catecholamine release.

Clinically.

- Initial sting is usually not felt.
- Short delay (30-120mins) before *systemic symptoms* begin.
  - Impending doom, agitation, diaphoresis, vomiting, generalised sweating & severe back pain (into limbs/abdomen).
  - Hypertension & tachycardia are common.
- Typically settles in 12 hours.
- Severe envenoming (ongoing significant opiate requirement).
  - At risk for toxic cardiomyopathy, cardiogenic shock & pulmonary oedema.
- Intracerebral haemorrhage has been documented.

Management.

- Pre-hospital.
  - Generous amounts of vinegar to stings
  - No role for pressure-immobilisation bandage.
- Hospital.
  - Potentially life-threatening emergency --> resuscitation bay.
  - Potential early life-threats include severe hypertension & pulmonary oedema.
  - Analgesia.
    - Fentanyl or morphine

- Antiemetics.
- Control HTN.
  - GTN infusion --> Aim systolic < 160mmHg.
- *Magnesium remains controversial !!*

Investigations.
- Typically used to exclude other potential differential diagnoses or to identify complications of illness.
- 12-lead ECG.
- CXR.
- FBC/EUC/Troponin
- ECHO.

Disposition.
- Patients *WITHOUT* symptoms at 2 hours *DO NOT* have irukandji syndrome.

BLUE-RINGED OCTOPUS.

- Small octopus found in shallow coastal waters around Australia.
- They are *NOT* aggressive & typically only bite if *'played with'*
- Envenoming causes ***rapid paralysis.***

Toxin.
- ***Tetrodotoxin*** is a potent sodium-channel blocking neurotoxin.
- Delivered by the *beak* NOT the tentacles.

Clinically.
- The bite may not be painful (local symptoms are minimal)
- Systemic envenoming characterised by rapidly progressive symmetrical descending flaccid paralysis (within minutes)
- Early signs = ptosis, blurred vision, diplopia, dysphagia.
  - Later --> generalised paralysis, respiratory failure --> respiratory arrest.
- Paralysis resolves spontaneously within 24 hours.

Management.
- Pre-hospital.
  - *Apply an pressure immobilisation bandage.*
  - Basic life-support (ventilation/oxygenation)
  - Urgent hospital transportation.
- Hospital.
  - Resuscitation area.
  - Immediate life-threats are paralysis (w/ respiratory failure) & hypotension.
  - Intubation & mechanical ventilation.
  - *NO ANTIVENOM AVAILABLE.*

Investigations.
- Used to exclude alternate diagnoses.
- Spirometry / peak flow - assessment of respiratory performance.

PUFFER FISH also contain tetrodotoxin - toxicity if fish are eaten !!