Blast Injury

Types of Blast Injury

- Primary - direct effect of blast overpressure on tissue. At risk are air-filled structures such as the lung, ear, and gastrointestinal tract.
- Secondary – damage by projectiles.
- Tertiary – when person is thrown through the air or effects due to wind
- Quaternary – burns, asphyxia, toxic inhalants

Epidemiology

Frequency depends on both the political stability of the region, e.g. terrorism, and local factors such as occupational health and safety priorities.

Presentation

- Rupture of tympanic membrane requires least pressure but may indicate additional more serious injury.
- Lungs may show evidence of pulmonary trauma, pneumothorax, haemothorax. Wheezing may be due to pulmonary contusion, inhalation of irritant gasses or dusts, pulmonary oedema or adult respiratory distress syndrome (ARDS).
- Abdominal injuries from explosions may not be immediately obvious and serial examinations are often required. Intestinal haematoma can take 12-36 hours to develop.
- Secondary eye injury in 25% blast survivors.

Investigations

Urine: U/A as screen for renal injury.
Bloods: FBC, UEC, CMP, CK, Trop, ABG+COHb, coags, G&H.
Imaging: CXR, ±CT abdo.

Complications:

Lacerations, fractures, dislocations, crush injury, compartment syndrome, burns, DIC.

Management

As per Trauma Overview.

- If there is any question of radiation or chemical contamination, decontamination of patients and equipment will be required.
- There will inevitably be huge emotional as well as physical stress. Psychological help will be required from the outset and a calm, organised, supportive and caring approach to management of people involved in the accident is essential.
- Gas exposures: CO, H_2S, Cyanide poisoning: See Toxicology articles.

Prognosis

- Mortality rates vary widely.
- Mortality is increased when explosions occur in closed or confined spaces.
- If tympanic membrane not ruptured then primary blast injury to other organs unlikely.