Management of blast injury in mass casualty environments
- A new algorithm
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Background

• The auditory system is extremely sensitive to blast
• Tympanic membrane perforation is the most common middle ear injury
• Blast lung injury has occurred without any ear injury in only a small number of cases
• Primary blast injuries of the auditory system are easily overlooked
Background

• Construction of a screening pathway
  - for detection of covert primary blast injury
  - ensures that auditory injuries are not overlooked

• For use in mass casualty situations
Background

- Ambroise Paré Prize 2011 (First prize)

- Awarded at the Combat Trauma Innovation Conference in London on 18 January 2012
Aim

• To determine a practical management pathway for cases of blast injuries in mass casualty environments by using the sensitivity of the ear to blast

• Comprehensive review of management of blast injuries of the ear
Methods

• Relevant literature search on blast injury was performed through MEDLINE
• Additional papers were obtained from the lists of references of the original articles
• Different studies were analysed including case reports
• Author’s experience and expertise
Discussion

• Initial management – ATLS guidelines
  - Airway maintenance with cervical spine control
  - Breathing
  - Circulation etc

• A brief assessment should be made to exclude any injury which is immediately life-threatening
Management of ear injuries

• Otological injuries involve the external, middle and inner ear
• Tympanic membrane perforation is the most common significant middle ear injury
• Patients exposed to blast require otological assessment and audiometry
• Management depends on nature of injuries
Screening method for blast injury in a mass casualty field environment

- Mass casualty situation
- Use in addition to other protocols
- Different scenarios
  - presence or absence of ear symptoms or signs
  - chest or abdominal symptoms

Diagram:

1. Blast Injury
   - Initial management
     - Major/external injury present
     - Management as required
     - Major/external injury ruled out
       - Intact/normal tympanic membrane (no ear symptoms/signs)
         - Observation (≤ 2 hrs) with abdominal & chest monitoring
         - Discharge if no problem
       - Ruptured tympanic membrane
         - Observation (≥ 4 hrs) with abdominal & chest monitoring
         - Abdominal & chest injury ruled out
         - Abdominal & chest injury symptoms
           - ENT follow-up
           - Thorough examination of abdominal & chest area / appropriate referral / monitoring for at least 24 hrs / ENT follow-up
Conclusion

• Simple but effective management of blast injuries particularly in mass casualty situations is needed
• Sensitivity of the ear can serve as one of the benchmarks in cases of blast injuries
• Algorithm will ensure
  - proper screening and triaging
  - early detection of potentially life threatening cases
  - ensure primary blast injury of the ear is not overlooked
Any questions?