BATTLEFIELD, BULLETS AND BUGS: THE VICIOUS CIRCLE IN GUNSHOTS

Lt Col Dr Inam Danish Khan, Professor, Army College of Medical Sciences, India

INTRODUCTION

- Battlefields have long witnessed gun-propelled bullet-shots.
- Extensively damaging subsonic or supersonic projectiles propelled by explosive force.
- The terminal ballistics forms a complex interplay of severely damaging impact and penetration .
- Resulting polytrauma and hemorrhage cause high morbidity and mortality than explosive injuries

CASE 1: MULTIPLE GUNSHOT WOUNDSWITH MULTIPLE INJURIES

- A 43-year-old military personnel sustained gunshot injuries .
- Left side of arm, axilla and back along with shrapnel injuries
- After initial management, he was evacuated to a secondary care
- Facility.
- X-ray and non-contrast CT- multiple rib fractures, comminuted fracture of left humerus, and multiple splinters in the right guteal, intertrochanteric region, and anterior compartment of right thigh.
- Initiated on mechanical ventilation under cover of antimicrobials, analgesics, and proton pump inhibitors.
- on fifth day post-injury on ventilator support, he was found to have moderate ascites, bilateral pleural effusion and hepatomegaly with grade I fatty liver
- On bed-side focused assessment with sonography in trauma.
- Continued to deteriorate with increasing creatinine levels refractory metabolic acidosis and severe ARDS
- Bilateral lung contusion, and Klebsiella pneumoniae bacteremia leading to sepsis.
- Leucocytes increased ,with neutrophilic leukocytosis, left shift, toxic granules and nucleated erythrocytes,elevated AST,ALT
- He succumbed following a cardiac arrest on 9th day post-injury
- Autopsy revealed multiple pus discharging wounds exposing the underlying muscles and neurovascular bundles.
- Lungs showed bronchopneumonia.
- Pleural fluid and swab cultures revealed multidrug resistant
- (MDR) Klebsiella pneumoniae.
- Cause of death-sepsis in a setting of severe ARDS with acute renal failure and refractory metabolic acidosis consequent to multiple gunshot wounds.

CASE 2: MULTIPLE GUNSHOT WOUNDS OF CHEST AND EXTREMITIES

- A young military personnel of 22 years having sustained multiple gunshot injuries
- Injuries on his right forearm, hand and leg along with left thigh and chest
- Air-evacuated to a secondary care facility
- Resuscitated with six units of packed red cells, wound , debridement, antimicrobials, proton pump inhibitors, and frusemide infusion.
- Segmental comminuted fracture of right proximal ulna and fracture of third left metacarpal were found.
- Breath sounds and bilateral crackles along with left lung opacities
- initiated on mechanical ventilation and transfused eight units of packed cells along with diuretics.
- Pus filled gunshot wounds-
  - 7 by 3 cm over left side of chest wall and axilla
  - 16 by 8 cm over right forearm
  - 18 by 6 cm over left thigh exposed the underlying muscles and neurovascular bundles
- Debrided collection in intramuscular pockets in left thigh, localized hematoma and contused muscles
- Forearm was stabilized by elbow spanning external fixator.
- Developed sepsis along with multiorgan dysfunction.
- He developed sudden respiratory distress, deteriorated rapidly
- Succumbed to cardiac arrest on 12th day post-injury.
- Autopsy revealed bronchopneumonia.
- Cause of death was sepsis in a backdrop of multiple gunshot
- wounds.

DISCUSSION AND CONCLUSION

- These patients survived gunshot inflicted although succumbed to respiratory complications and disseminated MDR Klebsiella pneumoniae infections leading to sepsis.
- Gunshot polytrauma in the battlefield can be challenging on both logistic and clinical axes.
- Terrain, weather, communication, capability and patient's condition affect foot, vehicle and air evacuation from mountains and jungles
- Virtopsy offers better visualization of gunshot wound entry and exit,
- Combination of virtopsy and autopsy, including dental autopsy for oromaxillofacial injuries, in post-mortem investigations can be targeted for clinicopathological, forensic and ballistic studies

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