Open fracture

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- An **open fracture**, also called a **compound fracture**, is a type of bone fracture in orthopedics that is frequently caused by high energy trauma. It is a bone fracture, also known as a broken bone, associated with a break in the skin continuity which can cause complications such as infection, malunion, and nonunion. Gustilo open fracture classification is the most commonly used method to classify open fractures, to guide treatment and to predict clinical outcomes. Advanced trauma life support is the first line of action in dealing with open fractures and to rule out other life-threatening condition in cases of trauma. Cephalosporins are generally the first line of antibiotics. The antibiotics are continued for 24 hours to minimize the risk of infections. Therapeutic irrigation, wound debridement, early wound closure and bone fixation are the main management of open fractures. All these actions aimed to reduce the risk of infections.

characteristics

- There are a range of characteristics of open fractures. There can be an obvious broken bone that is sticking out of the skin, but there can also be a broken bone that is associated with a very small "poke-hole" skin wound. Both of these situations are classified as open fractures.

Complications

- When a bone is broken and allowed to communicate with the outside environment, the probability of infection increases. Both the surrounding soft tissues can become infected, as well as the bone itself, which is called osteomyelitis. Additional complications include the broken bone ends not healing, called non-union, and the broken bone ends healing in an incorrect orientation, called malunion. Lastly, open fractures commonly occur in the setting of traumatic experiences, and the co-occurrence of these events may lead to chronic pain and mental health disorders

- **Causes**
- Open fractures can occur due to direct impacts such as high-energy physical forces (trauma), motor vehicular accidents, firearms, and falls from height. Indirect mechanisms include twisting (torsional injuries) and falling from a standing position. These mechanisms are usually associated with substantial degloving of the soft-tissues, but can also have a subtler appearance with a small poke hole and accumulation of clotted blood in the tissues. Depending on the nature of the trauma, it can cause different types of fractures.
- **Common fractures**
- Result from significant trauma to the bone. This trauma can come from a variety of forces – a direct blow, axial loading, angular forces, torque, or a mixture of these.

- **Pathological fractures**
- Result from minor trauma to diseased bone. These preexisting processes include metastatic lesions, bone cysts, advanced osteoporosis, etc.
- **Fracture-dislocations**
- Severe injury in which both fracture and dislocation take place simultaneously.
- **Gunshot wounds**
- Caused by high-speed projectiles, they cause damage as they go through the tissue, through secondary shock wave and cavitatio

- **Management**
- **Acute management**
- Urgent interventions, including therapeutic irrigation and wound debridement, are often necessary to clean the area of injury and minimize the risk of infection.[10] Other risks of delayed intervention include long-term complications, such as deep infection, vascular compromise and complete limb loss.[10] After wound irrigation, dry or wet gauze should be applied to the wound to prevent bacterial contamination. Taking photographs of the wound can help to reduce the need of multiple examinations by different doctors, which could be painful. Limb should be reduced and placed in a well-padded splint for immobilization of fractures. Pulses should be documented before and after reduction.[1]

- Wound cultures are positive in 22% of pre-debridement cultures and 60% of post-debridement cultures of infected cases. Therefore, pre-operative cultures no longer recommended. The value of post-operative cultures is unknown. Tetanus prophylaxis is routinely given to enhance immune response against *Clostridium tetani*. Anti-tetanus immunoglobulin is only indicated for those with highly contaminated wounds with uncertain vaccination history. Single intramuscular dose of 3000 to 5000 units of tetanus immunoglobulin is given to provide immediate immunity.

- Another important clinical decision during acute management of open fractures involves the effort to avoid preventable amputations, where functional salvage of the limb is clearly desirable. Care must be taken to ensure this decision is not solely based on an injury severity tool score, but rather a decision made following a full discussion of options between doctors and the person, along with their family and care team

Thank you