



433 Teams

# ORTHOPEDICS

Skills (3)

**Open fracture management**

Ortho433@gmail.com



جامعة  
الملك سعود  
King Saud University



## Introduction :

**Open fractures:** fractures that are exposed to the external environment. The amount of soft tissue destruction is related to the level of energy imparted to the limb during the traumatic episode

Open fracture can be an isolated entity or part of high energy multiple trauma injuries.

Approach should be always toward saving patient's life, save patient's limb then save limb's function

Most likely the trauma that cause open fracture is high energy (e.g. RTA) so you need first to stabilize the patient by ATLS whenever pt stable move to the limb

### Classification

Open fractures are commonly described using the Gustilo grading system:

**Type 1:** small (<1cm), clean wounds, minimal injury to the musculature and no significant stripping of periosteum from bone

**Type 2:** large (> 1 cm but < 10 cm) wounds, no significant soft tissue damage

**Type 3:** (>10 cm)

**o A:** large wounds ,associated with extensive injury of soft tissue but **adequate** viable soft tissue present to cover the bone

**o B:** large wounds those are associated with extensive injury of soft tissue **without** adequate viable soft tissue present to cover the bone

**o C:** Open fractures associated with **Vascular injury**

*To Know whether it is 3B Or 3C Check for pulse .*

**In ER:**

- ✓ **WIPE**
  - ✓ **Precautions guideline** (gowns, shoes cover, sterile gloves), dressing pads, normal saline
  - ✓ **Consent, explain what are going to do**
  - ✓ **Give him analgesia**
  - ✓ **Start IV antibiotic** based on open fracture initial staging and patient allergy history.
  - ✓ Ask the patient for **tetanus vaccine status**
- 
- ✓ **Initial local wound care:**
    - **Expose** the wound, **look for:** Size of the wound, swelling, deformity, color of skin, contamination
    - **Take picture** to avoid opening the wound again. Also, as medico legal documentation.
    - **Remove any obvious foreign body from wound** (avoid digging deep into wound) (e.g. glass, clothes or dust)
    - **Irrigate** wound with Normal Saline (1-2 L)
    - **Push** any prominent fracture fragment gently
    - **Cover** the wound with sterile saline-soaked gauzes
    - **Wrap** the limb with sterile cotton roll
- 
- ✓ **Check distal neurovascular status, and check for compartment syndrome** (wooden skin, compare to other leg, painful big toe traction)
- 
- ✓ **Reduction:**
    - Reduce fracture by applying traction and counter-traction followed by correcting the deformity.

### ✓ Immobilization:

- Using back slap the aim is to reduce the pain, prevent further vascular damage and skin damage.

### ✓ Re-check distal neurovascular status.

### ✓ Send patient for appropriate X-rays:

- Do X-ray 2 views and 2 joints(distal and proximal joint )

### Antibiotics selection:

According to doctor judgment (1<sup>st</sup> generation cephalosporin is used always then according to the wound he can add other antibiotics)

- ❖ **Grade 1** Give 1st generation cephalosporin (gram +ve) Ex: cefazolin
- ❖ **Grade 2** Cover both gram –ve and +ve by adding Gentamicin
- ❖ **Grade 3** Add penicillin to cover for anaerobes such as clostridium
- ❖ Add penicillin for all farm and soaked wounds

### Tetanus prevention:

A- Clean wounds criteria:	B- Other wounds
<6 hours from injury	Any wound <b>does not</b> apply to type A
Not a farm injury	
No significant devitalized tissue	
Non immersed wound	
Non contaminated wound	

Clean wounds		Other wounds					
Completed vaccination		Not Completed or Unknown		Completed vaccination		Not Completed or Unknown	
Booster < 10 years	Booster > 10 years	Td 0.5 ml IM		Booster <5 years	Booster > 5 years	TIG 250U and Td 0.5ml IM	
nothing	Td 0.5ml IM			nothing	Td 0.5 ml IM		

Tetanus toxoid (Td) considered as active immunity. While immunoglobulins (TIG) are passive immunity. Called in Arabic الكزاز. Ask about vaccination status. In KSA, most patients will be not completed or unknown.

***When the patient is stable take him to OR***

**In OR:**

Debridement, thorough irrigation, reduction and fixation.

**In debridement:**

Start with damaged skin

Then remove dead muscles (how to know if the muscles are dead or not? Look at: Color, capability to bleed, contractions by stimulate the muscle using forceps or electrical cutlery, muscle consistency. Then bone: any free bone is removed except intraarticular pieces)

**Irrigation:**

To prevent further contamination to the method using gravity wound The amount of normal saline used to irrigate is according to your judgment.

**Reduction then fixation:**

By external fixation

*We will not close the wound from the first look we need to keep it open and do 2nd look (after 48-72 hours). We may need 2nd debridement whenever the wound become clean close it the **definitive Tx will be IM nail.***

**Done By:**

**Mariam bawazir**

**Revised by:**

**Nada Dawood**

