Fracture Reduction And Fixation Techniques: Upper Extremities

The upper extremities, consisting of the shoulders, arms, elbows, forearms, wrists, and hands, play a crucial role in our daily activities. Fractures of the bones within these regions can result from a wide range of injuries, including falls, sports-related trauma, and motor vehicle accidents. Prompt and effective treatment is essential to regain optimal function and prevent complications.

Fracture Reduction

Fracture reduction refers to the process of realigning fractured bone fragments to their correct anatomical position. This is typically achieved through closed or open reduction techniques:

Fracture Reduction and Fixation Techniques: Upper Extremities by Peter V. Giannoudis

★★★★★ 5 out of 5

Language	: English
File size	: 217881 KB
Text-to-Speech	: Enabled
Screen Reader	: Supported
Enhanced typesetting	: Enabled
Print length	: 863 pages

- **Closed Reduction:** This involves manipulating the fractured bones back into place without making an incision. It is often performed under

sedation or general anesthesia.

- **Open Reduction:** In this method, an incision is made to directly visualize and reposition the bone fragments. This is usually indicated for complex fractures that cannot be reduced closed.

Fracture Fixation

Once the fracture has been reduced, fixation is used to maintain alignment and promote bone healing. Various methods of fixation are available, each with its unique advantages and disadvantages:

1. **External Fixation:** This technique involves applying external devices, such as pins, screws, or frames, to stabilize the fracture from outside the body. It provides immediate stability and allows for easy wound care.

2. **Internal Fixation:** This involves implanting devices within the bone to hold the fragments in place. Common internal fixation methods include:

    - **Plates and Screws:** Metal plates are applied to the fractured bone surface and secured with screws to provide compression and support.
    - **Intramedullary Nails:** These are rods inserted into the medullary canal (hollow space) of the bone to provide longitudinal stability.
    - **Cerclage Wires:** Thin wires are wrapped around the bone to provide circumferential support.

Choice of Fixation Method

The choice of fixation method depends on factors such as:

- Type and location of fracture
- Bone quality and surrounding soft tissues
- Patient's overall health and activity level
- Surgeon's preference and experience

Upper Extremity Fracture Types

Fractures of the upper extremities can occur in any bone, including:

- **Clavicle Fractures:** Bones that connect the breastbone to the shoulder blade
- **Scapular Fractures:** Fractures of the shoulder blade
- **Humeral Shaft Fractures:** Fractures of the upper arm bone
- **Elbow Fractures:** Fractures involving the humerus, radius, and ulna bones that form the elbow joint
- **Radial and Ulnar Fractures:** Fractures of the forearm bones
- **Carpal Fractures:** Fractures of the wrist bones
- **Metacarpal Fractures:** Fractures of the hand bones
- **Phalangeal Fractures:** Fractures of the finger and thumb bones

Rehabilitation

After fracture repair surgery, rehabilitation is essential to restore range of motion, strength, and function. This may involve:

- Physical therapy
- Occupational therapy
- Splinting and bracing
- Rest and activity modification

Complications

Although most upper extremity fractures heal well with appropriate treatment, there are potential complications that should be considered:

- Nonunion: Failure of the fracture to heal properly
- Malunion: Fracture healing in an abnormal position
- Infection
- Nerve damage
- Compartment syndrome (increased pressure within a muscle compartment)
- Blood clots

Fracture reduction and fixation techniques for upper extremities are crucial for restoring function and preventing complications. The choice of treatment

depends on the type and location of the fracture, as well as the individual patient's needs. With prompt and appropriate intervention, most upper extremity fractures can be successfully managed, allowing patients to regain full use of their affected limb.

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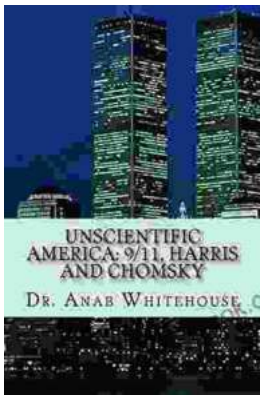

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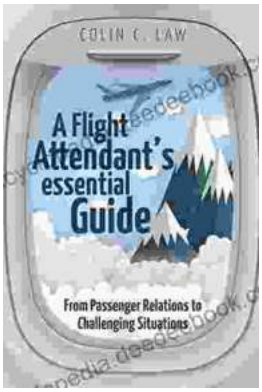

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