Hand Fracture Management: Optimizing Patient Outcomes

Hand fractures are a common injury, accounting for **10-25%** of all fractures and approximately **1.5 million** emergency department visits annually. Our focus is on restoring full hand function and preventing long-term disability.

Epidemiology and Functional Impact

Affected Demographics

Bimodal distribution: young males (trauma) and elderly females (falls).

Common Fractures

Phalangeal fractures (approx. 50%) and Metacarpal fractures (approx. 30%).

Daily Life Impact

Significant impact on daily activities, work, and overall quality of life.

Potential Complications

Can lead to long-term stiffness, pain, or functional deficits if improperly managed.

Initial Assessment and Diagnosis

Clinical Examination

- Swelling and Deformity
- Rotation (e.g., "scissoring" of fingers on fisting)
- Localized Tenderness

Imaging Techniques

- Standard X-rays (PA, lateral, oblique views)
- CT scan (for complex intra-articular or comminuted fractures)

> Classification is based on location (phalanx, metacarpal), type (spiral, transverse), and displacement/angulation.

Non-Surgical Management Principles

1

Indications

Stable, non-displaced fractures with minimal angulation or rotation.

2

Methods

Closed reduction (if necessary) followed by appropriate splinting or casting.

3

Immobilization

Typically 3-6 weeks, with serial X-rays at 1-2 weeks to monitor position.

Common splints include ulnar gutter (for 4th/5th MC/phalangeal), radial gutter (for 2nd/3rd MC/phalangeal), and buddy taping (for stable phalangeal fractures).

Surgical Management Principles

Indications

- Open fractures
- Significant displacement (>2mm)
- Unacceptable angulation or malrotation
- Intra-articular step-off (>1mm)
- Non-reducible fractures

Techniques

K-wire fixation: Simple, percutaneous for stable fractures.

ORIF: Plates and screws for comminuted, unstable, or intra-articular fractures.

The primary goal is anatomical reduction and stable fixation for early rehabilitation.

Rehabilitation: Restoring Function

Early Motion

Critical for preventing stiffness, often starts 1-2 weeks post-op with stable fixation.

Hand Therapy

Essential, led by Certified Hand Therapists (CHT), focusing on recovery.

Strengthening

Gradual progression of grip and pinch strength exercises to regain full function.

Modalities include edema control, scar management, and passive/active range of motion. Custom splinting addresses specific contractures.

Potential Complications

Stiffness/Contracture: Most common, especially with prolonged immobilization.

Malunion: Healing in a deformed position, leading to functional deficits.

Nonunion: Failure of the bone to heal, causing persistent pain.

Infection: Risk with open fractures or surgical intervention.

CRPS: Rare but debilitating pain condition.

Tendon/Nerve Injury: From direct trauma or surgical complications.

Conclusion: Keys to Optimal Outcomes

Achieving the best results in hand fracture management requires a comprehensive approach and strong collaboration.

1

Accurate Diagnosis

Timely and precise identification of the fracture is paramount.

2

Individualized Treatment

Careful selection of non-surgical or surgical approaches based on fracture characteristics.

3

Early Rehabilitation

Supervised hand therapy is crucial for restoring function and preventing stiffness.

4

Complication Management

Vigilant monitoring and prompt intervention for potential issues.

5

Collaborative Care

Effective partnership between surgeon, therapist, and patient for best results.