Chapter 13
Pediatric Digital and Metacarpal Injuries

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Keywords Pediatric hand • Physeal • Fight bite

Overview

Pediatric digital and metacarpal injuries require timely assessment of open versus closed status, neurovascular compromise, intra-articular versus extra-articular involvement, postreduction stability, associated injuries, displacement, physeal involvement, and nail bed involvement. "Fight bite" injuries and open fractures require escalation of management.

What to Ask

1. Are there any open wounds (possible open fracture)?
2. Are there any associated injuries?
3. What is the patient's neurovascular status?
4. Can the patient's jewelry be removed, and is the IV access on contralateral arm?

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What to Request

1. X-rays of the hand and finger involved.
2. If the fracture is displaced and requires reduction or a subungual hematoma is found that requires evacuation, request conscious sedation.

When to Escalate

1. Open fractures: Should be irrigated in ED and receive antibiotics (will require formal irrigation and debridement in OR).
2. "Fight bite" injuries require broad-spectrum antibiotics and formal irrigation and debridement in OR.

Imaging

1. AP, oblique, and lateral views of the hand are necessary for evaluation.
2. Obtained dedicated finger films if a specific finger is injured.
3. Postreduction X-rays of the hand or finger (AP and lateral) after reduction.

Effective Communication

1. Open versus closed
2. Neurovascular compromise
3. Intra-articular versus extra-articular
4. Stability after reduction
5. Associated injuries
6. Displaced/non-displaced

7. Physeal involvement
8. Nail bed involvement

What to Bring

1. Casting/splinting material (see Chapter 6)
2. Fluoroscopy if reduction required

Key Exam Pearls

1. Sensation of hand (median/radial/ulnar nerves) or specific fingers involved (ulnar and radial border).
2. If the patient cannot comply with sensory exam: sweat in a nerve distribution indicates intact sensation.
3. Motor (EDC and FDS/FDP or EPL and FPL).
4. Evaluate all wounds: dermal violation raises suspicion for open fracture.
5. Subungual hematoma >50% requires evacuation.

Reduction [1]

Reduction is often performed under conscious sedation in pediatric patients. The objective is to restore joint congruity and osseous alignment. Each reduction and splint will vary depending on the specific bone involved. For example, adequately reduced finger metacarpal fractures should be immobilized in an intrinsic plus splint, whereas an adequately reduced thumb metacarpal fracture should be immobilized in a thumb spica splint. In general pediatric patients should be overimmobilized, as they are less compliant and have decreased risks of stiffness after immobilization.

Adequate Reduction Parameters [1]

1. For metacarpal neck fractures Fig. 13.1 of the second and third fingers, 15° of deformity is acceptable; for the fourth and fifth fingers, 40ºof deformity is acceptable. Rotation should be corrected to anatomic.
2. For metacarpal shaft fractures, 10° is acceptable for second and third fingers, while 20° is acceptable for fourth and fifth fingers. Rotation should be corrected to anatomic. If the fracture is open or if there is a rotational deformity, operative interventions is indicated.

Figure 13.1 A small-finger metacarpal fracture in a skeletally immature patient

Follow-Up

1. Remain non-weight bearing and continue to ice and elevate.
2. See an orthopedic surgeon within 1 week.

Reference

1. Egol KA, Joval KJ, Zuckerman JD. Handbook of fractures. 4th ed. Philadelphia: Lippincott Williams & Wilkins; 2010.