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Acute Forearm Compartment Syndrome Following Distal Radius Fracture Managed with Emergency Fasciotomy and External Fixator

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INTRODUCTION

- Distal radius fractures are among the most common upper limb injuries.
- Acute forearm compartment syndrome following distal radius fracture is rare but limb-threatening.
- Early diagnosis and prompt surgical decompression are crucial to prevent irreversible muscle and nerve damage.
- This case highlights early recognition, timely fasciotomy, and damage-control stabilization

CASE REPORT

Patient: Middle-aged male **Mechanism:** High-energy trauma

- Presented with pain, swelling, and deformity of wrist.
- Radiographs: Displaced distal radius fracture with dorsal angulation.
- Developed severe pain disproportionate to injury.
- Tense forearm swelling.
- Pain on passive finger extension.
- Distal pulses palpable.
- **Clinical diagnosis:** Acute forearm compartment syndrome

Figure 1: Pre-operative X-ray showing displaced distal radius fracture with dorsal angulation (PA and lateral views)

OPERATIVE FINDINGS

MANAGEMENT

Emergency Surgical Intervention:

- Extensive volar forearm fasciotomy.
- Superficial flexor compartment released.
- Deep flexor compartment released.
- Carpal tunnel decompression performed

Intra-operative Findings:

- Muscles viable and bulging through fascial incisions.
- Confirmed raised compartment pressure.
- Timely intervention preserved muscle viability.

Fracture Stabilization:

- Bridging external fixator applied.
- Damage-control orthopaedic principles followed.
- Allowed soft-tissue recovery .
- Maintained alignment and radial length

Wound **Management:**

- Delayed closure / secondary healing .
- Serial wound inspections performed

Figure 2: Intra-operative fasciotomy showing viable muscle with bulging and external fixator pins

DISCUSSION

- Compartment syndrome after distal radius fracture is uncommon but reported in high-energy injuries.
- Severe soft-tissue trauma increases risk.
- Diagnosis is primarily clinical .
- Should NOT be delayed for compartment pressure measurements .
- High index of suspicion essential in cooperative
- patients with classic symptoms and signs.
- Fasciotomy within the "golden period" is critical .
- Preserves muscle viability and prevents Volkmann's ischaemic contracture.
- External fixation serves as damage-control strategy .
- Provides stable alignment.
- Allows access to soft tissues.
- Reduces infection risk vs. immediate definitive internal fixation

Figure 3: Surgical team performing fasciotomy and external fixator application

CONCLUSION

- Acute compartment syndrome can complicate distal radius fractures.
- Particularly after high-energy mechanisms.
- Early recognition and prompt fasciotomy are limbsaving.
- External fixation is effective damage-control option.
- Greater awareness prevents permanent disability and devastating outcomes

Figure 4: Early post-operative X-rays with external fixator showing maintained alignment (PA and lateral views)

Figure 5: Follow-up X-rays demonstrating progressive fracture healing and union