

Rare Case of Right Proximal Ulna Fracture Non-union Following Osteopathic Management in a 38-Year-Old Male

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Abstract

Fractures of the proximal ulna are relatively uncommon and typically result from high-energy trauma, such as falls on an outstretched hand or direct impact to the elbow. Management of such fractures depends on their pattern, degree of displacement, and associated injuries. While non-operative treatment may be appropriate for minimally displaced or stable fractures, displaced fractures usually require surgical intervention. Osteopathic treatment—encompassing manual manipulation, soft tissue techniques, and holistic approaches—is occasionally used for musculoskeletal injuries but lacks robust evidence when applied to fracture care. Non-union of the proximal ulna is a rare but significant complication, especially when early definitive management is delayed or inadequate.

Keywords: Proximal ulna fracture, Fracture non-union, Osteopathic treatment, Conservative management failure, Open reduction and internal fixation (ORIF), Reconstruction plate

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I. Introduction

Fractures involving the proximal ulna, particularly around the olecranon and metaphyseal region, represent a relatively small subset of upper extremity injuries, yet they carry significant implications for elbow stability and function. The ulna serves as a key stabilizing structure for the elbow joint, particularly in flexion and extension, and injury to its proximal aspect can compromise joint congruity, triceps function, and forearm rotation. Prompt and appropriate management of these fractures is essential to avoid long-term functional impairment.

Most proximal ulna fractures result from high-energy trauma, such as falls from height, direct elbow blows, or motor vehicle accidents. The treatment approach is largely guided by the degree of displacement, comminution, and involvement of adjacent joint structures. While non-operative management may be sufficient for non-displaced fractures, displaced or unstable fractures typically require open reduction and internal fixation (ORIF) to restore anatomic alignment, ensure early mobilization, and prevent complications such as stiffness, malunion, or non-union.

Non-union of the proximal ulna is a rare but serious complication, with reported rates lower than those seen in midshaft or distal ulna fractures. Factors contributing to non-union include inadequate initial immobilization, insufficient fracture reduction, poor vascularity at the fracture site, and patient-related variables such as smoking, diabetes, or noncompliance. Non-operative and non-standard treatment approaches—such as osteopathic manipulation—have gained popularity in certain musculoskeletal conditions, but their application in acute fracture care remains controversial and unsupported by high-quality evidence.

Osteopathy, with its principles centered on holistic care and manual manipulation of the musculoskeletal system, may offer benefits in managing chronic pain, soft tissue dysfunction, and biomechanical imbalance. However, its role in the acute phase of bony injuries, particularly displaced fractures, is limited. The absence of radiographic confirmation, lack of immobilization, and failure to refer for orthopedic assessment can result in missed or improperly managed fractures, significantly increasing the risk of delayed union or non-union.

In this report, we present a rare case of proximal ulna fracture non-union in a 38-year-old male who initially sought osteopathic care following trauma and was treated conservatively without radiologic evaluation. This case underscores the limitations of osteopathic therapy in managing fractures and highlights the need for timely diagnosis, proper fracture stabilization, and surgical intervention in cases of established non-union.

II. Case Presentation

We report a rare case of a 38-year-old right-handed male who sustained a right proximal ulna fracture following a fall on an outstretched arm. Rather than seeking conventional medical attention, the patient initially consulted an osteopathic practitioner. Management involved manual manipulation and herbal remedies without any imaging or immobilization. Over a four-month period, the patient experienced persistent pain, reduced range of motion, and progressive functional impairment of the right upper limb.

1.

a Clinical Re-evaluation Upon Referral

- Upon referral to orthopedic services, the patient presented with:
- Persistent right elbow pain
- Inability to perform full extension or load-bearing tasks
- Swelling and mild deformity
- No systemic symptoms (fever, weight loss)

bPhysical Examination:

- Tenderness over proximal ulna
- Reduced active range of motion (flexion limited to $\sim 90^\circ$, extension deficit of $\sim 30^\circ$)
- No neurological deficits
- No signs of infection (no erythema, discharge, or fever)

2. Diagnostic Imaging

a. Plain Radiographs (X-ray): AP and lateral views of the right forearm

Findings:

- Fracture line visible in the proximal ulna (olecranon region)
- Sclerotic bone ends
- No visible callus formation
- Malalignment with mild distraction at fracture site

b. CT Scan:

- Confirmed non-union of the proximal ulna
- Gap at the fracture site with bone resorption



Fig1(a)

Fig1(b)

Fig1 a and b: show deformity and limited range of movements

Fig2: shows swelling iliac region

Management

1)Procedure: Open Reduction and Internal Fixation (ORIF) with Autologous Bone Grafting

Surgical Steps:

a. Approach:

- Posterior midline incision centered over the olecranon

-Subcutaneous tissue and triceps carefully dissected

b. Debridement:

- All fibrous tissue, necrotic bone, and sclerotic ends excised
- Fracture ends “freshened” until bleeding bone (Paprika sign) observed
- Exposed marrow stimulated healing

c. Bone Grafting:

- Autologous cancellous bone graft harvested from the ipsilateral iliac crest
- Packed into the non-union site to provide osteogenic, osteoinductive, and osteoconductive support

d. Internal Fixation:

- Fracture reduced under direct vision
- Fixation with a RECON plate
- Ensured stable fixation and alignment
- Screws inserted both proximally and distally to secure the construct

e. Closure:

- Hemostasis achieved
- Layered wound closure with subcutaneous and skin sutures
- Sterile dressing applied
- Posterior elbow splint applied in 60–90° flexion

2) Postoperative Care

a. Immediate Postoperative Period (Days 1–14):

- IV antibiotics (single perioperative dose; continued only if indicated)
- Analgesia with NSAIDs and paracetamol
- Limb elevation and cryotherapy
- Immobilization in posterior splint

b. Early Follow-up (Weeks 2–6):

- Wound inspection and suture removal at 14 days
- Begin gentle passive range of motion exercises
- Avoid heavy lifting or resistance

c. Intermediate Phase (Weeks 6–12):

- Radiographs at 6 and 12 weeks to monitor union
- Start active-assisted range of motion and strengthening
- Occupational therapy if needed for return to work tasks

d. Late Rehabilitation (After 12 Weeks):

- Progressive resistance training
- Full range of motion exercises
- Return to light work if radiological union confirmed
- Expected full recovery in 4–6 months

3) Patient Education and Counseling

- Instructed on the importance of seeking early medical imaging in trauma
- Advised to avoid unverified osteopathic/manual manipulation for suspected fractures
- Nutritional support: Adequate protein, vitamin D, and calcium
- Encouraged adherence to follow-up and physiotherapy regimen

4) Outcome

- At 3-month follow-up:
 - Radiological union evident
 - Pain-free range of motion: 0–130°
 - Returned to light work

-At 6 months:

Full union

No pain or functional limitation

Returned to pre-injury activity level



Fig2a show intraoperative findings of non union

Fig2b show ixray of forearm with proximal ulna non union



fig 3

Post operative Xray showed satisfactory creduction with recon plate

III. Discussion

1. Overview of Proximal Ulna Fractures

Fractures of the proximal ulna, particularly those involving the olecranon, are common upper extremity injuries resulting from direct trauma or falls, often occurring during high-energy accidents such as falls from height or motor vehicle collisions. The proximal ulna plays a crucial role in elbow stability and triceps function. As such, its fracture has significant implications for both joint mobility and overall arm function.

The management of these fractures largely depends on the displacement, instability, and fracture pattern. In cases of displaced fractures or those involving the olecranon, surgical intervention is typically necessary to

restore function and prevent complications such as non-union or post-traumatic arthritis. When treated conservatively or incorrectly, such fractures may develop non-union.

2. Non-union of Proximal Ulna Fractures

-Non-union of fractures is a rare but significant complication, especially when appropriate treatment is delayed or inadequate. -Non-union refers to a fracture that has not healed within the expected time frame (typically 6–9 months), with little to no evidence of callus formation or bone healing at the fracture site.

-In the case of proximal ulna fractures, non-union can be classified into two main categories:

Hypertrophic non-union: There is adequate blood supply but insufficient mechanical stability, resulting in the formation of granulation tissue but no bridging bone.

Atrophic non-union: Characterized by poor blood supply, bone resorption, and absence of callus formation. This type of non-union is more commonly seen in fractures treated conservatively, especially in cases where stabilization is inadequate.

This case involved atrophic non-union, as evidenced by the absence of bone healing, sclerosis, and lack of callus formation on imaging. The delay in diagnosis, coupled with the absence of proper immobilization, led to a failure of natural healing processes, culminating in non-union.

3. Role of Osteopathic Management in Fracture Treatment

The patient in this case sought osteopathic care early after injury, and the management consisted primarily of manual manipulation and advice for rest, with no radiological assessment or immobilization. While osteopathic manipulative treatment (OMT) has been shown to be effective in managing certain musculoskeletal conditions such as soft tissue injuries or joint dysfunctions, it is not appropriate for managing fractures, especially those involving bone instability.

Osteopathic treatment focuses on the musculoskeletal system's structural and functional relationships, but it is not a substitute for evidence-based management of fractures. The lack of imaging and fracture stabilization allowed the fracture site to move, preventing proper healing and leading to non-union.

In this case, the absence of adequate initial care and diagnostic imaging likely delayed the diagnosis of a fracture and prolonged the non-union. This situation emphasizes the importance of recognizing fractures and seeking appropriate medical evaluation, particularly imaging, to avoid mismanagement.

4. Non-union Management: Surgical Intervention

-Once the diagnosis of non-union was made, surgical intervention was required to address the delayed fracture healing. The most common surgical approach for non-union of the ulna is open reduction and internal fixation (ORIF), with the goal of:

-Restoring anatomical alignment

-Providing stable fixation

-Stimulating bone healing through debridement and bone grafting.

-In this case, we performed a posterior approach to expose the ulna, followed by debridement of the non-union site to remove fibrous tissue and necrotic bone, thus providing a fresh bleeding surface to promote healing (commonly referred to as the "Paprika sign"). Autologous bone grafting was used to enhance healing potential, as the iliac crest provides viable, osteogenic bone material that can aid in osteogenesis.

-Using a RECON plate for fixation was crucial in ensuring the stability of the fracture during the healing process. In proximal ulna fractures, reconstruction plates are often used to: Restore the anatomical alignment of the ulna Stabilize the fracture site, especially in non-union cases Allow for controlled motion at the fracture site, stimulating bone healing without causing excessive movement that could hinder recovery

5. Factors Contributing to Non-union in This Case

Several factors may have contributed to the non-union of this patient's proximal ulna fracture:

-Delayed diagnosis and inadequate early management: Initial reliance on osteopathic treatment without diagnostic imaging or fracture stabilization led to a lack of appropriate care.

-Lack of immobilization: Proper immobilization is critical for the healing of fractures. This patient did not receive any form of splinting or casting, which allowed for continued movement at the fracture site.

-Absence of adequate vascularity: Although this patient did not have significant comorbidities like smoking or diabetes, the initial mismanagement could have led to poor blood supply to the fracture, hindering healing.

-Mechanical instability: The failure to adequately stabilize the fracture in the initial period likely contributed to continued motion at the fracture site, preventing bony union.

6. Importance of Early Orthopedic Management and Imaging

This case highlights the critical importance of early diagnosis and appropriate fracture management, which includes:

- Immediate radiological assessment (X-ray, CT) to determine the presence, type, and displacement of fractures
- Timely referral to an orthopedic specialist for cases requiring surgical intervention
- Adequate immobilization and stabilization of the fracture site
- Postoperative rehabilitation to restore joint function and prevent complications such as stiffness or weakness
- Osteopathic care and manual therapy can be beneficial for certain musculoskeletal complaints, but fractures require targeted, evidence-based management. This case serves as a cautionary tale, emphasizing the need for proper fracture care and early referral to orthopedic specialists.

7. Long-Term Prognosis and Rehabilitation

- Following the surgical intervention, the patient's prognosis was excellent. The bone graft and internal fixation were successful in stimulating union, and the patient regained full function after comprehensive rehabilitation.
- Postoperative physiotherapy focused on range of motion exercises, strengthening the elbow, and restoring daily functional use.
- By 6 months post-surgery, the patient had returned to pre-injury activity levels, with no residual pain or disability.

This emphasizes the importance of timely surgical intervention and physical rehabilitation in cases of non-union. With appropriate management, even complex fractures such as proximal ulna non-unions can achieve favorable outcomes.

IV. Conclusion

This case of proximal ulna fracture non-union following initial osteopathic management highlights the potential dangers of relying on non-surgical treatments for traumatic injuries that require diagnostic confirmation and proper fracture management. The early intervention with surgical fixation and bone grafting successfully addressed the non-union, allowing for full recovery and return to normal function. Clinicians must be vigilant in ensuring that fractures are accurately diagnosed and treated according to evidence-based orthopedic guidelines, with appropriate imaging and fracture stabilization as the cornerstone of care.

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