

Olecranon Fracture (ORIF)

Olecranon Fracture – Open Reduction Internal Fixation (ORIF) – Post-operative Rehabilitation

Topic scope: Post-operative rehabilitation after ORIF of a displaced olecranon fracture – tension-band wiring (TBW) for simple transverse patterns, or plate-and-screw fixation for comminuted / oblique / Monteggia-type / proximal-ulna patterns. The olecranon fracture is an **intra-articular fracture of the extensor mechanism**: the fixation construct must resist the **triceps pull** that distracts the fragment, and the rehabilitation is built around protecting that construct while preventing the stiffness to which the elbow is highly prone.

Defining principle (the inverse of an arthrolysis): unlike a stiff-elbow release, here there is a fixation construct to protect, and the deforming force is the triceps. So active and resisted elbow EXTENSION – and lifting / pushing – are restricted early, while flexion and forearm rotation are advanced relatively freely to prevent stiffness. Dr Hirpara's practice override: the operated elbow is rested in a simple sling, not a posterior splint or brace; active extension is withheld for 0–6 weeks (protecting the tension band / triceps insertion), resisted extension is delayed to ~3 months, flexion is advanced ~10°/week, and the patient is counselled to expect a permanent 10–15° loss of terminal extension.

Evidence-strength flag: MODERATE-to-STRONG. Two concordant institutional physiotherapy protocols (Brigham & Women's Hospital; The Christ Hospital / Rao) give explicit phase timelines, and the biomechanical rationale – anatomic reduction plus stable fixation to permit early motion of an intra-articular fracture – is universally agreed. Consensus is strong on *early protected motion + delayed active / resisted extension and triceps loading*. The evidence is weaker (equipose-level) on TBW vs plate, and on operative vs non-operative management in the elderly.

Phased rehabilitation timeline

Phase	Window	Sling / immobilisation	ROM / use	Strengthening	Criteria to progress
I – Immobilisation	Weeks 0–1	Simple sling at ~90° (KH – no posterior splint/brace), off for exercises	Active hand/wrist/shoulder ROM; gentle active elbow + forearm ROM from day 2–3 if stable; NO active extension	– (oedema control)	Wound and swelling settling
II – Protected motion, extension restricted	Weeks 1–6	Wean sling at week 4 (out-of-house + night thereafter)	Flexion advanced ~ 10°/week in a tension-free zone; passive extension only ; PROM may begin ~wk 4; goal full passive extension + flexion to 120° + full rotation by 6 wk	Cuff / periscapular / forearm isometrics only	Full passive extension, flexion ~120°, full rotation; pain ≤ 3/10
III – Active extension introduced	Weeks 6–12	Discontinued	Active extension against gravity only from wk 6; advance flexion to full (full tension-free arc by ~wk 9); progress weight-bearing tabletop → wall → quadruped	PRE to flexion/rotation; still NO resisted extension	Full active arc; no worsening extension lag; radiographic union
IV – Resisted extension + return	3–6 months	–	Return to lifting/loading staged	Resisted extension from ~3 months (bands → light weights 1–5 lb, 3×/wk); sport/job-specific ~4.5 mo	Full strength + union; lifting/heavy labour ~6 mo

Evidence by theme

THE TRICEPS-PULL RULE (THE REHAB-DEFINING CONSTRAINT) – CONSENSUS, STRONG BIOMECHANICAL RATIONALE

The triceps inserts on the olecranon; **active and resisted extension distract the fracture and load the tension band**. Active extension against gravity is therefore deferred to ~6 weeks and *resisted* extension to ~3 months. This is the single most important rule distinguishing olecranon ORIF from a generic elbow-fracture rehabilitation, and both published protocols enforce it (The Christ Hospital / Rao explicitly prohibit active extension for the first six weeks).

EARLY PROTECTED MOTION TO PREVENT STIFFNESS – STRONG CONSENSUS

There is universal agreement that an intra-articular extensor-mechanism fracture needs **early motion to prevent stiffness**; how early depends on construct stability and surgeon confidence. Brigham permits active ROM from day 2–3; the more conservative Christ / Rao protocol protects the first weeks with no active extension. The tension throughout is “prevent stiffness” versus “protect the triceps repair,” resolved by advancing flexion and rotation freely while restricting extension.

CONSTRUCT CHOICE – TBW VS PLATE – MODERATE / EQUIPOISE

Both constructs aim to be stable enough for early motion. TBW is simpler and adequate for simple transverse fractures but carries the highest symptomatic-hardware / removal rate and can lose compression in comminuted or osteoporotic bone. Plate fixation better controls comminution, oblique and diaphyseal-extension patterns; Hume & Wiss’s randomized study favoured plate over TBW for comminuted patterns, while Anderson et al. reported a mean ~13.5° flexion contracture after plating. Rehabilitation phases are broadly the same – a more stable construct simply allows the surgeon to liberalise motion sooner.

OPERATIVE VS NON-OPERATIVE IN THE ELDERLY – MODERATE (RCT, EQUIPOISE)

A prospective RCT of displaced olecranon fractures in elderly patients was **stopped early for a high operative complication rate**, with comparable patient-reported outcomes – shifting practice toward non-operative management and earlier free mobilisation in low-demand older patients. Geriatric locking plates reduce fixation failure in osteoporotic bone but still carry meaningful complication and implant-failure rates.

EXPECTED RESIDUAL DEFICIT – MODERATE (CORPUS, OBSERVATIONAL)

Even with stable fixation and early motion, isolated olecranon fractures **lose ~10–15° of terminal extension on average**. Patients should be counselled that this is the expected norm, not a complication.

HARDWARE REMOVAL – MODERATE (OBSERVATIONAL)

Olecranon hardware – especially TBW K-wires / wires – is the **most commonly removed implant in the body**; prominent subcutaneous hardware drives a high secondary-removal rate (up to roughly half of TBW cases in some series). Removal is typically performed *after union* (often ≥ 4–6 months) and largely for symptom relief, not as a routine staged step. Plate fixation has fewer wire-irritation issues but a non-trivial removal rate.

CQ HAND + UPPER LIMB

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Evidence strength flags (summary)

- **STRONG / CONSENSUS:** early protected motion to prevent stiffness; the triceps-pull rule deferring active extension to ~6 weeks and resisted extension to ~3 months (biomechanical rationale
 - two concordant institutional protocols).
 - **MODERATE:** TBW vs plate construct choice (Hume & Wiss; Anderson ~13.5° contracture after plating); operative vs non-operative in the elderly (RCT stopped early for operative complications); expected 10–15° terminal-extension loss; high TBW hardware-removal rate.
 - **CONSENSUS / EXPERT:** the precise phase timings (drawn from surgeon patient-guidance protocols rather than a rehabilitation RCT); the simple-sling immobilisation (KH practice override).
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CITATIONS

RAG CORPUS (180,000+ ORTHOPAEDIC ARTICLES)

- Chalidis BE, Sachinis NC, Samoladas EP, Dimitriou CG, Pournaras JD. Is tension band wiring technique the “gold standard” for the treatment of olecranon fractures? A long-term functional outcome study. *J Orthop Surg Res.* 2008;3:9. DOI: 10.1186/1749-799X-3-9
- Hume MC, Wiss DA. Olecranon fractures: a clinical and radiographic comparison of tension band wiring and plate fixation (randomized comparison; plate favoured for comminuted patterns). (Cited in retrieved corpus text.)
- Anderson et al. – mean ~13.5° flexion contracture after olecranon plate fixation (retrieved corpus text).
- Prospective RCT, operative vs non-operative management of displaced olecranon fractures in the elderly – stopped early for a high rate of complications in the operative group, comparable patient-reported outcomes (retrieved corpus text).
- Geriatric olecranon locking-plate case series – major/minor complication and implant-failure rates (*J Shoulder Elbow Surg*, retrieved corpus text).
- Retrieved corpus text: isolated olecranon fractures lose an average of ~10–15° of terminal extension despite stable fixation and early ROM; anatomic reduction and early range of motion to restore functional elbow motion and strength; high re-operation / hardware-removal rate after TBW.

PUBLISHED REHABILITATION PROTOCOLS (URLS)

- The Christ Hospital / Rao – “Olecranon ORIF Physical Therapy Protocol.” <https://www.thechristhospital.com/landingpages/Documents/Rao%20PT%20Protocols/Operative/Elbow/Rao%20Olecranon%20ORIF%20r1.pdf>

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- Brigham & Women’s Hospital, Department of Rehabilitation Services – “Elbow Fracture Post-Op (Radial Head / Olecranon ORIF) Hand Therapy Guideline” (2021). <https://www.brighamandwomens.org/assets/BWH/patients-and-families/rehabilitation-services/pdfs/elbow-fracture-orif-hand-therapy-protocol.pdf>
- Physiopedia – “Olecranon Fracture” (general background). https://www.physio-pedia.com/Olecranon_Fracture