CQ HAND + UPPER LIMB
SPECIALIST ORTHOPAEDIC SURGEON

EVIDENCE SUMMARY

Distal Radius Fracture

title: “Distal Radius Fracture” slug: distal-radius-fracture region: wrist audience: patient mesh_terms: [“Radius Fractures”, “Wrist Injuries”, “Colles’ Fracture”, “Colles’ fracture”, “Smith’s fracture”, “broken wrist”, “DRF”] article_count: 1 model_used: Qwen3.6-35B-A3B-Q8_0.gguf generated_at: ‘2026-06-14T15:31:04+00:00’ key_articles: - title: “Management of Complications of Distal Radius Fractures” ref_num: 1 evidence_tier: paper doi: 10.1016/j.hcl.2014.12.002 year: 2015 - title: “Combined median and ulnar nerve palsy complicating distal radius fractures” ref_num: 2 evidence_tier: paper doi: 10.1016/j.otsr.2018.04.026 year: 2018 - title: “Management of Complications of Forearm Fractures” ref_num: 4 evidence_tier: paper evidence_level: 5 doi: 10.1016/j.hcl.2015.01.010 year: 2015 - title: “Distal Radius Fractures” ref_num: 6 evidence_tier: paper doi: 10.1016/j.hcl.2005.04.001 year: 2005 - title: “Loss of radial height in extra-articular distal radial fracture following volar locking plate fixation” ref_num: 7 evidence_tier: paper doi: 10.1016/j.otsr.2021.102842 year: 2021 - title: “Does concomitant ulnar styloid fracture and distal radius fracture portend poorer outcomes? A meta-analysis of comparative studies” ref_num: 8 evidence_tier: paper evidence_level: 1 doi: 10.1016/j.injury.2017.08.061 year: 2017 - title: “The Use of Bone Grafts and Substitutes in the Treatment of Distal Radius Fractures” ref_num: 9 evidence_tier: paper evidence_level: 4 doi: 10.1016/j.hcl.2012.02.004 year: 2012 - title: “External Fixation of Distal Radius Fractures” ref_num: 10 evidence_tier: paper evidence_level: 1 doi: 10.1016/j.hcl.2009.08.008 year: 2010 - title: “Distal radius fracture metaphyseal comminution: A new radiographic parameter for quantifying, the metaphyseal collapse ratio (MCR)” ref_num: 11 evidence_tier: paper doi: 10.1016/j.otsr.2013.05.002 year: 2013 - title: “Radiographs Versus Radiographic Measurements in Distal Radius Fractures” ref_num: 12 evidence_tier: paper doi: 10.1007/s12593-014-0164-0 year: 2015 - title: “Volar plate versus k-wire fixation of distal radius fractures” ref_num: 13 evidence_tier: paper evidence_level: 3 doi: 10.1016/j.injury.2015.08.040 year: 2016 - title: “Soft Tissue Complications of Distal Radius Fractures” ref_num: 15 evidence_tier: paper evidence_level: 5 doi: 10.1016/j.hcl.2009.11.002 year: 2010 - title: “Management of Complications of Ligament Injuries of the Wrist” ref_num: 16 evidence_tier: paper evidence_level: 5 doi: 10.1016/j.hcl.2015.01.003 year: 2015 - title: “The Die Punch Fragment: Analysis of Fragment Geometry and Need for Fixation” ref_num: 17 evidence_tier: paper doi: 10.1055/s-0040-1712328 year: 2022 - title: “The course of the posterior interosseous nerve in relation to the proximal radius: Is there a reliable landmark?” ref_num: 18 evidence_tier: paper doi: 10.1016/j.injury.2015.01.028 year: 2015 - title: “When is a Monteggia fracture not a Monteggia fracture?” ref_num: 19 evidence_tier: paper evidence_level: 4 doi: 10.1016/j.injury.2005.08.028 year: 2007 - title: “Does the CT improve inter- and intra-observer agreement for the AO, Fernandez and Universal classification systems for distal radius fractures?” ref_num: 20 evidence_tier: paper doi: 10.1016/j.injury.2014.06.017 year: 2014 - title: “The Essex-Lopresti Injury:”

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ref_num: 21 evidence_tier: paper evidence_level: 5 doi: 10.1016/j.hcl.2020.07.012 year: 2020 synthesis_version: “v2” verifier_status: skipped

Overview

- Prevention of complications associated with distal radius fractures should be the treating surgeon’s primary concern [1].
- Early diagnosis and treatment are important to avoid long-term consequences of distal radius fracture complications [1].
- Combined median and ulnar nerve palsy related to distal fractures of the radius is exceedingly rare [2].
- Combined median and ulnar nerve palsy complicating distal radius fractures require a standardised management strategy [2].
- Optimal outcomes in the treatment of forearm fracture–dislocations depend on early recognition and management [4].
- Restoration and maintenance of anatomic alignment are key principles for optimal outcomes in forearm fracture–dislocations [4].
- Novel locking plate designs have resulted in a rethinking of the contemporary approach to distal radius fracture fixation [6].
- A certain degree of radial height loss is noted in patients undergoing fracture fixation with volar locking plate for extra-articular distal radius fractures [7].
- An associated ulnar styloid fracture does not affect the outcomes of a distal radial fracture [8].
- Clinicians should be cautious in electing operative treatment for patients with an ulnar styloid fracture [8].
- Bone graft substitutes are primarily used to provide structural stability in distal radius fractures [9].
- Bone graft substitutes may facilitate early return to function in distal radius fractures [9].
- The risk of nonunion is minimal in distal radius fractures [9].
- External fixation supplemented with percutaneous pins is an excellent option for treating displaced fractures of the distal radius [10].
- External fixation supplemented with percutaneous pins yields reliably good results for displaced distal radius fractures [10].
- External fixation supplemented with percutaneous pins has a low reoperation rate for displaced distal radius fractures [10].
- External fixation supplemented with percutaneous pins has a low complication rate for displaced distal radius fractures [10].
- Die punch fragment size is not an indicator of the need for or use of a dorsal approach in distal radius fracture fixation [17].

Anatomy & Pathophysiology

- Prevention of complications associated with distal radius fractures should be the treating surgeon's primary concern, with early diagnosis and treatment being important to avoid long-term consequences [1].
- Combined median and ulnar nerve palsy related to distal fractures of the radius are exceedingly rare but require a standardized management strategy [2].
- Optimal outcomes in the treatment of forearm fracture–dislocations depend on early recognition and management, with restoration and maintenance of anatomic alignment being the key principles [4].
- A certain degree of radial height loss is noted in patients undergoing fracture fixation with volar locking plate for extra-articular distal radius fractures [7].
- An associated ulnar styloid fracture does not affect the outcomes of a distal radial fracture and clinicians should be cautious in electing operative treatment for patients with an ulnar styloid fracture [8].
- Bone graft substitutes are primarily used to provide structural stability and perhaps early return to function in distal radius fractures, where the risk of nonunion is minimal [9].
- Metaphyseal collapse ratio, a novel radiographic parameter, was found to provide a reliable measure of metaphyseal comminution, and to be significantly correlated with other radiographic parameters that predict distal radius fracture instability [11].
- There may be radiographic factors other than measures of deformity that some surgeons use to determine recommendations for surgery [12].
- Early accurate diagnosis of intrinsic carpal ligament injuries provides for best outcomes, while delayed diagnosis leads to arthritis within 10 years if not treated [16].
- DP fragment size is not an indicator of the need for or use of a dorsal approach in distal radius fracture fixation [17].
- Pronation effectively increases the proximal 'safe zone' of the posterior interosseous nerve, suggesting the forearm should be placed in pronation to minimize the risk of iatrogenic injury [18].
- CT scan should be requested only by experienced hand surgeons in order to help guide treatment, as it does not significantly improve inter- and intra-observer agreement for all classification systems [20].

Classification

- CT scans do not significantly improve inter- and intra-observer agreement for the AO, Fernandez, and Universal classification systems for distal radius fractures [20].
- The metaphyseal collapse ratio (MCR) is a novel radiographic parameter that provides a reliable measure of metaphyseal comminution [11].
- The metaphyseal collapse ratio (MCR) is significantly correlated with other radiographic parameters that predict distal radius fracture instability [11].
- There may be radiographic factors other than measures of deformity that some surgeons use to determine recommendations for surgery [12].

Clinical Presentation

- Prevention of complications associated with distal radius fractures should be the treating surgeon's primary concern [1].
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- External fixation supplemented with percutaneous pins has a low reoperation rate for displaced distal radius fractures [10].
- External fixation supplemented with percutaneous pins has a low complication rate for displaced distal radius fractures [10].
- Metaphyseal collapse ratio is a novel radiographic parameter that provides a reliable measure of metaphyseal comminution [11].
- Metaphyseal collapse ratio is significantly correlated with other radiographic parameters that predict distal radius fracture instability [11].
- There may be radiographic factors other than measures of deformity that some surgeons use to determine recommendations for surgery in distal radius fractures [12].
- Soft tissue complications encountered during the management of distal radius fractures include tendon injury, nerve dysfunction, vascular compromise, skin problems, compartment syndrome, and complex regional pain syndrome [15].
- Complications associated with soft tissues may be more problematic than the bone injury itself in distal radius fractures [15].

- Early accurate diagnosis of intrinsic carpal ligament injuries provides for best outcomes [16].
- Delayed diagnosis of intrinsic carpal ligament injuries leads to arthritis within 10 years if not treated [16].
- Pronation effectively increases the proximal 'safe zone' of the posterior interosseous nerve [18].
- The forearm should be placed in pronation to minimize the risk of iatrogenic injury to the posterior interosseous nerve [18].
- Monteggia fractures can be easily overlooked if radiographs of the elbow are not taken [19].
- Pre-existing congenital radial head dislocations can lead to inappropriate surgical intervention if not distinguished from Monteggia fractures [19].
- Early recognition and treatment of Essex-Lopresti injury is associated with improved outcomes [21].

Investigations

- Early diagnosis and treatment of complications associated with distal radius fractures are important to avoid long-term consequences [1].
- Combined median and ulnar nerve palsy related to distal radius fractures is exceedingly rare [2].
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- Pre-existing congenital radial head dislocations can lead to inappropriate surgical intervention if misdiagnosed as Monteggia fractures [19].

Treatment

- Prevention of complications associated with distal radius fractures should be the treating surgeon's primary concern [1].
- Early diagnosis and treatment are important to avoid long-term consequences of distal radius fracture complications [1].
- Combined median and ulnar nerve palsy related to distal fractures of the radius is exceedingly rare [2].
- Combined median and ulnar nerve palsy complicating distal radius fractures require a standardised management strategy [2].
- Optimal outcomes in the treatment of forearm fracture–dislocations depend on early recognition and management [4].
- Restoration and maintenance of anatomic alignment are key principles in the treatment of forearm fracture–dislocations [4].
- A certain degree of radial height loss is noted in patients undergoing fracture fixation with volar locking plate for extra-articular distal radius fractures [7].
- An associated ulnar styloid fracture does not affect the outcomes of a distal radial fracture [8].
- Clinicians should be cautious in electing operative treatment for patients with an ulnar styloid fracture [8].
- Bone graft substitutes are primarily used to provide structural stability in distal radius fractures [9].
- Bone graft substitutes are used to perhaps provide early return to function in distal radius fractures [9].
- The risk of nonunion is minimal in distal radius fractures [9].
- External fixation supplemented with percutaneous pins is an excellent option for treating displaced fractures of the distal radius [10].
- External fixation supplemented with percutaneous pins for displaced distal radius fractures yields reliably good results [10].
- External fixation supplemented with percutaneous pins for displaced distal radius fractures has a low reoperation rate [10].
- External fixation supplemented with percutaneous pins for displaced distal radius fractures has a low complication rate [10].
- There may be radiographic factors other than measures of deformity that some surgeons use to determine recommendations for surgery in distal radius fractures [12].
- Superior radiological results were attained with volar plating compared to k-wiring for distal radius fractures [13].
- Superior radiological results with volar plating did not correlate with a better functional outcome compared to k-wiring at 32 months follow up [13].

Complications

- Prevention of complications associated with distal radius fractures should be the treating surgeon's primary concern [1].
- Early diagnosis and treatment of complications are important to avoid long-term consequences [1].
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- External fixation supplemented with percutaneous pins for displaced distal radius fractures has a low reoperation rate [10].
- External fixation supplemented with percutaneous pins for displaced distal radius fractures has a low complication rate [10].
- Soft tissue complications encountered during the management of distal radius fractures include tendon injury, nerve dysfunction, vascular compromise, skin problems, compartment syndrome, and complex regional pain syndrome [15].
- Complications associated with soft tissues may be more problematic than the bone injury itself in distal radius fractures [15].

Recovery

- Prevention of complications associated with distal radius fractures should be the treating surgeon's primary concern [1].

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- External fixation supplemented with percutaneous pins has a low reoperation rate for displaced distal radius fractures [10].
- External fixation supplemented with percutaneous pins has a low complication rate for displaced distal radius fractures [10].
- Metaphyseal collapse ratio is a novel radiographic parameter that provides a reliable measure of metaphyseal comminution [11].
- Metaphyseal collapse ratio is significantly correlated with other radiographic parameters that predict distal radius fracture instability [11].
- Volar plating attains superior radiological results compared to k-wiring for distal radius fractures [13].
- Superior radiological results with volar plating do not correlate with better functional outcomes compared to k-wiring at 32 months follow up [13].
- Early accurate diagnosis of intrinsic carpal ligament injuries provides for best outcomes [16].
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Key Evidence

- [Paper] Prevention of complications associated with distal radius fractures should be the treating surgeon's primary concern, with early diagnosis and treatment being important to avoid long-term consequences. (10.1016/j.hcl.2014.12.002)
- [Paper] Combined median and ulnar nerve palsy related to distal fractures of the radius are exceedingly rare but require a standardised management strategy. (10.1016/j.otsr.2018.04.026)
- [L5] Optimal outcomes in the treatment of forearm fracture–dislocations depend on early recognition and management, with restoration and maintenance of anatomic alignment being the key principles. (10.1016/j.hcl.2015.01.010)
- [Paper] The management of distal radius fractures is in the midst of a renaissance with novel locking plate designs resulting in a rethinking of the contemporary approach to fracture fixation. (10.1016/j.hcl.2005.04.001)
- [Paper] A certain degree of radial height loss is noted in patients undergoing fracture fixation with volar locking plate for extra-articular distal radius fractures. (10.1016/j.otsr.2021.102842)
- [L1] Based on this meta-analysis, an associated ulnar styloid fracture does not affect the outcomes of a distal radial fracture and clinicians should be cautious in electing operative treatment for patients with an ulnar styloid fracture. (10.1016/j.injury.2017.08.061)
- [L4] Bone graft substitutes are primarily used to provide structural stability and perhaps early return to function in distal radius fractures, where the risk of nonunion is minimal. (10.1016/j.hcl.2012.02.004)
- [L1] External fixation supplemented with percutaneous pins is an excellent option for treating displaced fractures of the distal radius, with reliably good results, a low reoperation rate, and a low complication rate. (10.1016/j.hcl.2009.08.008)
- [Paper] Metaphyseal collapse ratio, a novel radiographic parameter, was found to provide a reliable measure of metaphyseal comminution, and to be significantly correlated with other radiographic parameters that predict distal radius fracture instability. (10.1016/j.otsr.2013.05.002)
- [Paper] There may be radiographic factors other than measures of deformity that some surgeons use to determine recommendations for surgery. (10.1007/s12593-014-0164-0)
- [L3] Although superior radiological results were attained with volar plating, these results did not correlate with a better functional outcome compared to k-wiring at 32 months follow up. (10.1016/j.injury.2015.08.040)
- [L5] This review focuses on soft tissue complications encountered during the management of distal radius fractures, including tendon injury, nerve dysfunction, vascular compromise, skin problems, compartment syndrome, and complex regional pain syndrome, noting that complications associated with soft tissues may be more problematic than the bone injury itself. (10.1016/j.hcl.2009.11.002)
- [L5] Early accurate diagnosis of intrinsic carpal ligament injuries provides for best outcomes, while delayed diagnosis leads to arthritis within 10 years if not treated. (10.1016/j.hcl.2015.01.003)
- [Paper] DP fragment size is not an indicator of the need for or use of a dorsal approach in DRF fixation. (10.1055/s-0040-1712328)

- [Paper] Pronation effectively increases the proximal 'safe zone' of the nerve, suggesting the forearm should be placed in pronation to minimize the risk of iatrogenic injury. (10.1016/j.injury.2015.01.028)
- [L4] Monteggia fractures can be easily overlooked if radiographs of the elbow are not taken, and pre-existing congenital radial head dislocations can lead to inappropriate surgical intervention. (10.1016/j.injury.2005.08.028)
- [Paper] CT scan should be requested only by experienced hand surgeons in order to help guide treatment, as it does not significantly improve inter- and intra-observer agreement for all classification systems. (10.1016/j.injury.2014.06.017)
- [L5] Early recognition and treatment is associated with improved outcomes. (10.1016/j.hcl.2020.07.012)

References

[1] Management of Complications of Distal Radius Fractures. *Hand Clinics*. 2015. DOI: 10.1016/j.hcl.2014.12.002 [2] Combined median and ulnar nerve palsy complicating distal radius fractures. *Orthopaedics & Traumatology: Surgery & Research*. 2018. DOI: 10.1016/j.otsr.2018.04.026 [4] Management of Complications of Forearm Fractures. *Hand Clinics*. 2015. DOI: 10.1016/j.hcl.2015.01.010 [6] Distal Radius Fractures. *Hand Clinics*. 2005. DOI: 10.1016/j.hcl.2005.04.001 [7] Loss of radial height in extra-articular distal radial fracture following volar locking plate fixation. *Orthopaedics & Traumatology: Surgery & Research*. 2021. DOI: 10.1016/j.otsr.2021.102842 [8] Does concomitant ulnar styloid fracture and distal radius fracture portend poorer outcomes? A meta-analysis of comparative studies. *Injury*. 2017. DOI: 10.1016/j.injury.2017.08.061 [9] The Use of Bone Grafts and Substitutes in the Treatment of Distal Radius Fractures. *Hand Clinics*. 2012. DOI: 10.1016/j.hcl.2012.02.004 [10] External Fixation of Distal Radius Fractures. *Hand Clinics*. 2010. DOI: 10.1016/j.hcl.2009.08.008 [11] Distal radius fracture metaphyseal comminution: A new radiographic parameter for quantifying, the metaphyseal collapse ratio (MCR). *Orthopaedics & Traumatology: Surgery & Research*. 2013. DOI: 10.1016/j.otsr.2013.05.002 [12] Radiographs Versus Radiographic Measurements in Distal Radius Fractures. *Journal of Hand and Microsurgery*. 2015. DOI: 10.1007/s12593-014-0164-0 [13] Volar plate versus k-wire fixation of distal radius fractures. *Injury*. 2016. DOI: 10.1016/j.injury.2015.08.040 [15] Soft Tissue Complications of Distal Radius Fractures. *Hand Clinics*. 2010. DOI: 10.1016/j.hcl.2009.11.002 [16] Management of Complications of Ligament Injuries of the Wrist. *Hand Clinics*. 2015. DOI: 10.1016/j.hcl.2015.01.003 [17] The Die Punch Fragment: Analysis of Fragment Geometry and Need for Fixation. *Journal of Hand and Microsurgery*. 2022. DOI: 10.1055/s-0040-1712328 [18] The course of the posterior interosseous nerve in relation to the proximal radius: Is there a reliable landmark?. *Injury*. 2015. DOI: 10.1016/j.injury.2015.01.028 [19] When is a Monteggia fracture not a Monteggia fracture?. *Injury Extra*. 2007. DOI: 10.1016/j.injury.2005.08.028 [20] Does the CT improve inter- and intra-observer agreement for the AO, Fernandez and Universal classification systems for distal radius fractures?. *Injury*. 2014. DOI: 10.1016/j.injury.2014.06.017 [21] The Essex-Lopresti Injury:. *Hand Clinics*. 2020. DOI: 10.1016/j.hcl.2020.07.012

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