

## Distal radius fracture (part one)

### Abstract

Distal radius fractures (fractures of the lower end of the radius) are among the most common hand injuries, with an increasing prevalence with age. These fractures have been recognized since ancient times and were first accurately described in the 18th century by Pouteau and later by Abraham Colles. Today, treating these fractures requires a precise understanding of the anatomy of the radius and the wrist joint. Standard imaging techniques, such as radiography and CT scans, are essential for fracture evaluation and surgical planning. Various classification systems exist for these fractures; however, there is still no global consensus on the best treatment approach. The primary goal of treatment is to restore wrist function to its pre-injury level. For active patients, anatomical reduction and surgery are recommended, whereas conservative treatment may be sufficient for elderly and inactive individuals. Key parameters, such as articular surface incongruity, dorsal tilt, and radial length, play a crucial role in treatment decisions. However, accurately assessing these parameters using conventional radiographs remains challenging. Ultimately, treatment should be tailored to the patient's activity level and individual needs. Extensive research has been conducted on this fracture, with over 1,800 articles published as of July 2022, including 628 in the past year alone. This article is the first part of a comprehensive review focusing on the anatomy, physiology, and treatment of this common fracture.

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Distal radius fracture is one of the most common hand injuries. A 1998 assessment in the United States reported approximately 643,000 cases annually<sup>(1)</sup>, with 372,000 occurring in individuals aged 65 and older<sup>(2)</sup>. The incidence of these fractures increases with age. The medical literature on this injury is extensive; by July 2022, over 1,800 articles had been published, including 628 within the past year. In ancient times, physicians such as Galen and Hippocrates [(131–201 BC)] considered this injury a wrist dislocation. This perception changed in 1783 when French surgeon Pouteau classified it as a distinct fracture, now known as the Pouteau fracture. However, due to the political climate of 18th-century Europe, the English-speaking medical community largely ignored French scientific contributions. It was not until 1814 that Irish surgeon Abraham Colles described the fracture in the *Edinburgh Medical and Surgical Journal*. His observations, based entirely on clinical examination, were remarkably precise—especially considering that radiography would not be invented until 1895, 81 years later. Most scholarly discussions of Colles' fracture include this historical account. In my view, referencing it is important for two reasons: first, to appreciate how past scientists achieved remarkable accuracy without modern diagnostic tools; and second, to acknowledge the enduring legacy of medical journals in preserving and transmitting knowledge. In fact, I obtained a copy of Colles' original publication from the University of Kentucky Medical School library. Colles stated that despite displacement, the limb would eventually regain full, painless movement<sup>(15)</sup>. While his prognosis was widely accepted for many years, it has been significantly challenged by modern research, particularly in recent decades. Over time, various classifications have been assigned to this fracture, including Smith, Barton, Melone V1, AO C3, and Chauffeur's fracture. The latter term has historical significance: in the early days of the automobile industry, cars were started using a hand crank. If the crank forcefully rebounded, it could cause a fracture of the radial styloid process.

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However, such eponyms are no longer commonly used, as the preferred terminology today is "distal radius fracture," which accurately encompasses all intra-articular and metaphyseal fractures of this region.

**Anatomy**

Treatment of distal radius fractures requires a complete understanding of the anatomy of the radius. For this purpose, Figure 1 - 6 have been used. Figure 1 displays the volar surface of the radius, with the lunate facet positioned on the left and the

scaphoid facet on the right. The proximal and volar bony prominence of the radius is known as the lunate facet buttress. This buttress provides structural support to the lunate facet and must be stabilized in cases of unstable fractures. The radial tuberosity (marked as X) is situated at the right edge of the bone, adjacent to the watershed line (also known as the water-shedding line), and is covered by the pronator quadratus muscle. The cortical bone in this region is notably thick and resilient. In Figure 2 and 3, the Lister's tubercle is seen at the center, which forms a thin cortical shell of low resistance.



Figure 1: Volar Surface of the Radius

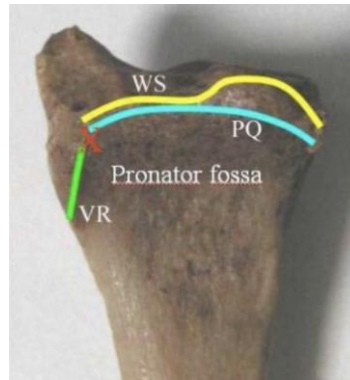


Figure 2: WS = Watershed



Figure 3: Dorsal Radius



Figure 4: Radial Surface of the Radius



Figure 5: Radius and ulna



Figure 6: Distal Radial Articular Surface: On the right is the scaphoid facet; on the left is the lunate facet. These surfaces have the strongest bones.

## Imaging

### Standard radiography

As observed in Figure 7, the lunate facet covers the volar surface of the bone.

Pre-reduction radiography can clearly reveal small, non-displaced fragments within the joint, which may become obscured after reduction or casting. Additionally, X-rays taken under traction can help identify these fragments (Figure 8).

### The tear drop angle

The volar edge fragment is evaluated using standard lateral radiography or a 10-degree lateral tilt to measure the angle, known as the tear drop angle. This angle is formed by the intersection of a line passing through the center of the tear drop and another line following the center of the radial longitudinal axis. Normally, the tear drop angle is approximately 70 degrees. However, as the volar border fragment becomes displaced, this angle decreases<sup>(3)</sup> (Figure 9).

### Computed Tomography (CT)

Although CT scans are not routinely necessary for most of these fractures, they are invaluable for surgical planning in complex and comminuted cases. When a CT scan is requested, it should be performed after initial reduction and immobilization to evaluate fragment displacement, joint surface irregularities, and comminution. Understanding the thickness of CT slices allows the surgeon to estimate the size and dimensions of the fragments.

Key Anatomical Parameters:

- Joint surface irregularity
- Radial inclination
- Volar and dorsal tilt
- Radial length and ulnar variance
- Comminution
- Associated fracture of the ulnar styloid

#### 1. Joint Surface Irregularity

The joint surface must be smooth to function properly. Irregularity can lead to pain, joint stiffness, and arthritis. Irregularities greater than 1 millimeter put the patient at a risk of developing arthritis.



Figure 7: Normal Wrist PA X-ray



Figure 8: Lateral X-ray: Normal Wrist



Figure 9: Tear Drop Angle

## 2. Radial Inclination

In Figure 10, radial inclination is indicated by the sharp line. Its natural angle ranges from 21 to 25 degrees. This angle is determined by the intersection of a line drawn along the distal articular surface of the radius in an anteroposterior wrist X-ray and a line perpendicular to the radial diaphysis

## 3. Volar and Dorsal Tilt

The volar and dorsal tilt angles are formed by the intersection of a line along the distal articular surface of the radius in a lateral X-ray and a line perpendicular to the diaphysis of the radius (Figure 11 and 12).

## 4. Radial Length and Ulnar Variance

Radial length plays a significant role in distal radius fractures. The normal radial length ranges from 9 to 12 millimeters. In these fractures, the affected bone collapses under impact, leading to a loss of length. An increase in relative ulnar length can result in ulnar impaction syndrome, a painful condition caused by excessive contact, friction, and wear between the ulna and the carpal bones. This can potentially lead to

degenerative tearing of the Triangular Fibrocartilage Complex (TFCC).

## 5. Positive, Neutral, and Negative Ulnar Variance

The relationship between radial length and ulnar variance is essential. Radial length is measured from the distal ulna to the radial styloid process. When ulnar variance is neutral (zero), the radial length should fall between 9 and 12 millimeters (Figure 13). Goals of repairing distal radius fractures are as follows:

- Radial Shortening: Less than 5 millimeters.
- Radial Inclination: Less than 15 degrees.
- Articular Step-off: Less than 2 millimeters.

## Classification

The purpose of any classification system is as follows:

- Categorizing injuries.
- Guiding treatment.
- Facilitating discussions.
- Predicting outcomes.



Figure 10: Tear Drop Angle

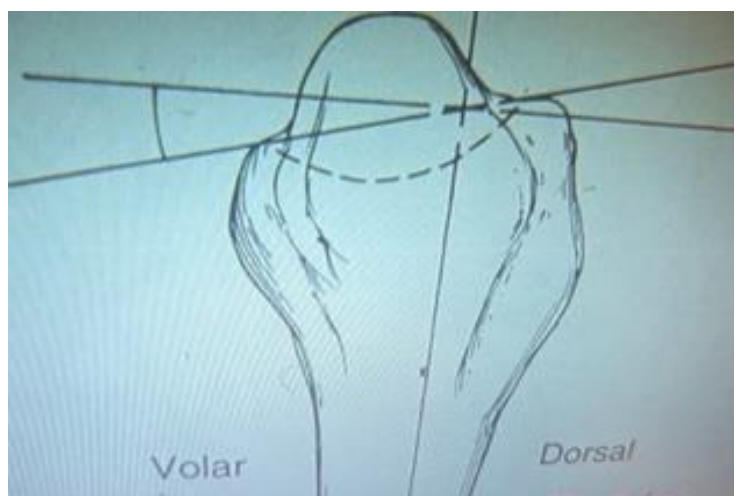


Figure 11: Tear Drop Angle

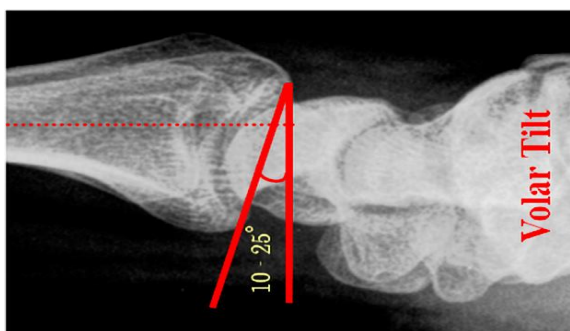


Figure 12: Tear Drop Angle

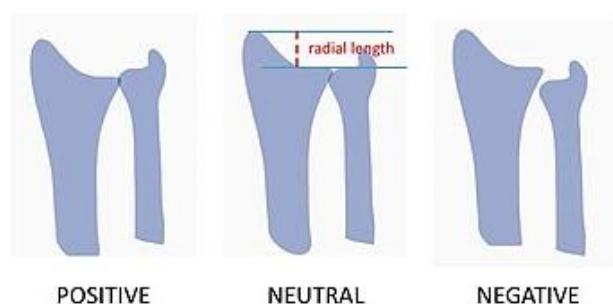


Figure 13: Tear Drop Angle

Each classification system has its own strengths and weaknesses, depending on its objectives. Commonly used systems for distal radius fractures include Frykman, Melone, AO, Fernandez, and Universal.

### Frykman Classification

The Frykman system focuses on injuries involving the distal radioulnar joint. For quick reference, different types are outlined in Table 1.

#### Frykman System Details:

Although the Frykman classification does not directly assist with treatment, it emphasizes the involvement of articular surfaces and the distal ulna<sup>(4)</sup>.

### Melone Classification

The Melone classification (Table 2) divides the distal radius into four sections. Two central fragments together form the lunate fossa<sup>(5)</sup>.

### AO Classification

This system consists of 27 subgroups divided into three main categories:

- A: Extra-articular.
- B: Partially intra-articular.
- C: Completely intra-articular.

In addition, this classification identifies the direction of displacement, the degree of comminution, and ulnar damage<sup>(6)</sup>.

### Fernandez Classification

The Fernandez classification (Table 3) responds to the AO system by focusing on the mechanism of injury with an emphasis on guiding treatment<sup>(7)</sup>.

### Universal Classification

This classification is descriptive, but lacks a direct treatment-oriented approach<sup>(8)</sup> (Table 4).

**Table 1: Frykman Classification**

Radius Fracture	Ulna Fracture	
	Absent	Present
Extra-articular	I	II
Intra-articular involving radiocarpal joint	III	IV
Intra-articular involving DRUJ (distal radio-ulnar joint)	V	VI
Intra-articular involving both radiocarpal & DRUJ	VII	VIII

**Table 2: Melone Classification**

Type	Description	Note
I	No displacement of the medial complex, no comminution.	Fracture is stable after closed reduction
II	Unstable depression fracture of the lunate fossa ("die-punch"). Moderate to severe medial complex displacement. Comminution of dorsal and volar cortices.	IIA - Irreducible, closed fracture. IIB - Irreducible, closed due to impaction
III	Type II fracture plus a volar spike of the radius.	May impinge on median nerve
IV	Split fracture with severe comminution and rotation of fragments.	Unstable
V	Explosion injury with severe displacement and comminution.	Often associated with diaphyseal comminution

**Table 3: Fernandez Classification**

Type	Description	Stability	Number of Fragments	Associated Lesions (see below)	Recommended Treatment
I	Bending fracture - metaphysis	Stable or unstable	2 main fragments with variable metaphyseal comminution	Uncommon	Stable -> conservative Unstable -> percutaneous pinning or external fixation
II	Shearing fracture - articular surface	Unstable	2, 3, comminuted	Less uncommon	Open reduction with screw-plate fixation
III	Compression fracture - articular surface	Stable or unstable	2, 3, 4, comminuted	Common	Closed Limited arthroscopic release Extensile open reduction Percutaneous pins plus external and internal fixation Bone graft
IV	Avulsion fracture, radiocarpal fracture, dislocation	Unstable	2 (radial/ulnar styloids), 3, comminuted	Frequent (especially ligamentous injury)	Closed or open reduction with pin/screw fixation or tension wiring
V	Combined fracture (high-energy injury) - Often intra-articular and open	Unstable	Comminuted	Always present	Combined treatment

**Table 4: Universal Classification**

Type	Location	Displacement	Sub-type
I	Extra-articular	Undisplaced	
II	Extra-articular	Displaced	A: Reducible, stable B: Reducible, unstable C: Irreducible
III	Intra-articular	Undisplaced	
IV	Intra-articular	Displaced	A: Reducible, stable B: Reducible, unstable C: Irreducible D: Complex

**Column Model**

This system classifies fracture patterns (Figure 14 and 15) based on the theory of three wrist columns and bases its treatment approach on this model. It was

independently expanded by Medoff in 1994 and by Rikli and Regazzoni<sup>(9)</sup>. As mentioned earlier, this anatomical model serves as an algorithmic guide for the surgical management of distal radius fractures.

Before proceeding to treatment and surgical intervention, the column model is first utilized<sup>(10)</sup>.

The distal radius and ulna can be viewed as three separate columns, each with its own bony and ligamentous structure, providing stability to both the radiocarpal and radioulnar joints. The distal radius includes the radial and intermediate columns, which depend on the bone shaft or pedestal for support. The distal ulna, along with the triangular fibrocartilage complex (TFCC), forms the ulnar column.

#### Radial Column

The radial column consists of the radial styloid and the scaphoid facet. This column serves as the attachment site for the brachioradialis tendon, the long radiolunate ligament, and the radioscapocapitate ligament. It restricts translational movement of the radiocarpal joint and functions as a weight-bearing platform for activities where the wrist is in a pronated position, such as using a walker. Additionally, the radial column maintains the alignment of the carpal bones, ensuring an even distribution of the load on the scaphoid and lunate facets. It also acts as an anchor for the radioscapocapitate ligament, preventing carpal translation toward the ulna<sup>(11)</sup>.

A fracture of this column results in a large styloid fragment. The fracture line crosses from the edge between the two fossae upwards, reaching the metaphysis. The pull of the brachioradialis muscle causes a reduction in radial height, radial deviation, and joint surface irregularity.

#### Intermediate Column

The primary function of this column is to transfer load from the carpus to the forearm<sup>(9-13)</sup>. Fractures in this column result in free intra-articular fragments, a volar rim, dorsal angle fragment of the ulna, and the dorsal wall of the lunate fossa, which essentially involve two distinct joint surfaces (Figure 16).

The volar rim fragment is the attachment site for the short radiolunate ligament and the lower volar radioulnar ligament. Unstable fracture models of the volar rim fragment may lead to: (1) a palmar instability model with palmar displacement and shortening of the fragment due to flexion and shear mechanisms, known as volar Barton fractures, or (2) axial unstable models that cause compression and dorsal flexion of the fragments, resulting in secondary carpus displacement<sup>(12)</sup>.

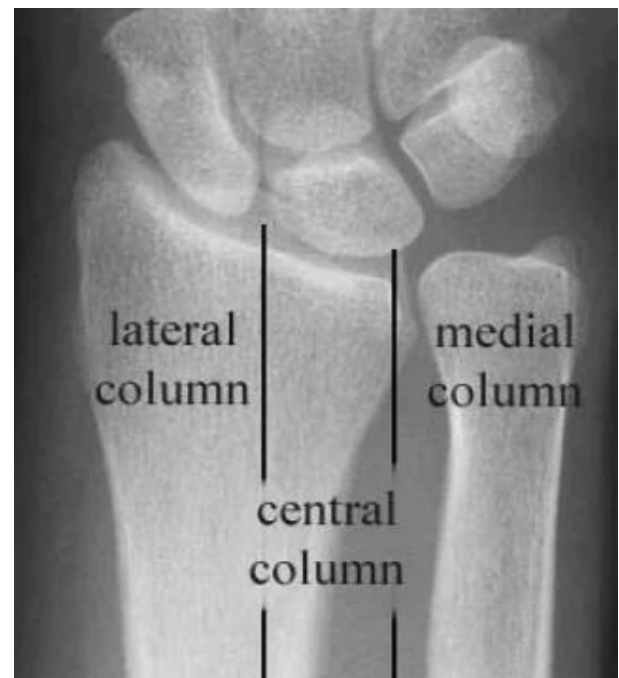


Figure 14: Column Model

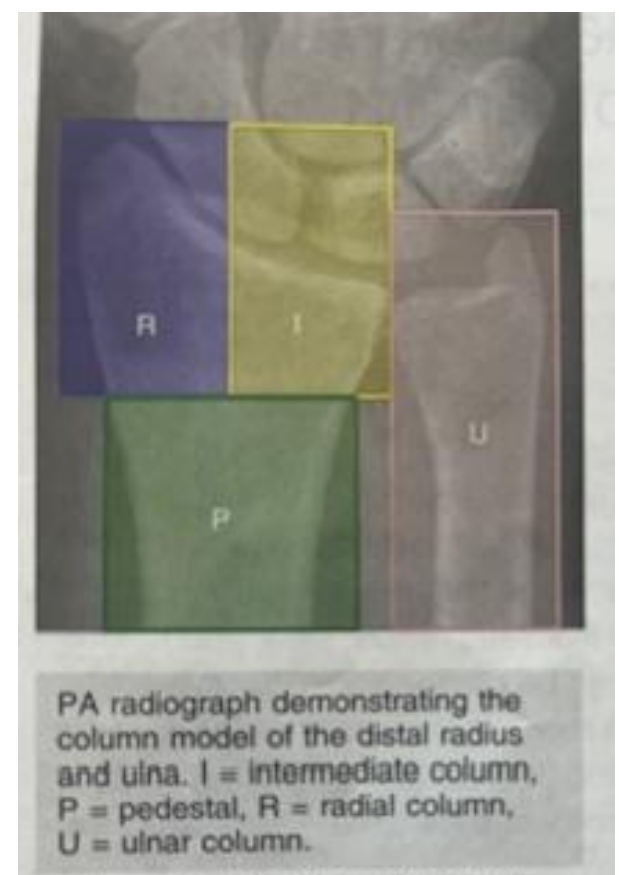
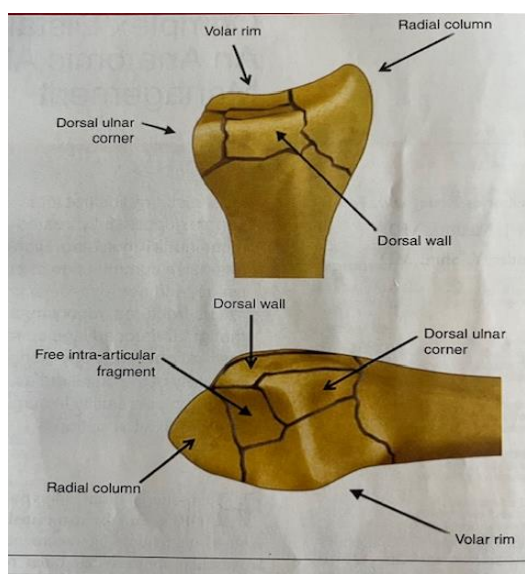


Figure 15: Image from the Journal of the American Academy of Orthopaedic Surgeons, 2017; 25: 77-81.

The dorsal angle fragment of the ulna acts as an anchor for the posterior lower radioulnar ligament and often displaces upwards, backward, and toward the ulna, potentially causing joint incongruity in the distal radioulnar joint (DRUJ), thereby jeopardizing the kinematics necessary for forearm rotation. The dorsal wall is the attachment site for the dorsal radiocarpal ligament and functions to stabilize against dorsal carpal dislocation. Dorsal wall fractures, caused by flexion and axial loads, are often comminuted and compressed. The free intra-articular fragment may involve the lunate and scaphoid facets.



**Figure 16: Journal of Orthopaedic Surgery of the American Academy of Orthopaedic Surgeons from the year 2017, volume 25, pages 77-81**

### Ulna Column

This column plays a major role in the stability of the distal radioulnar joint and forearm movements<sup>(10,11)</sup>. Although the stability of the distal radioulnar joint is due to the morphology of the ulna head within the sigmoid fossa, ligaments also play a vital role. The volar and dorsal radioulnar ligaments originate from the volar rim and the dorsal angle fragment of the ulna. The deep and superficial fibers attach to the ulnar fossa and the tip of the ulnar styloid, respectively. Radial shortening, decreased radial inclination, and dorsal inclination exert significant stress on the distal radioulnar joint and the ulnar styloid, causing damage to both<sup>(13)</sup>.

### Pedestal

The radial and intermediate columns are supported by the distal radius metaphysis, or pedestal. Although the pedestal usually remains intact in distal radius

fractures, it may occasionally undergo slight displacements or significant comminution. This membrane, or distal interosseous membrane, extends from the distal ulna diaphysis to the radial metaphysis. Along with its internal ligaments (distal oblique bundle), this membrane serves as one of the secondary stabilizers<sup>(14)</sup>.

### Treatment Considerations

Although the orthopedic community has rejected Callus's theory from 1841<sup>(15)</sup> that "this fracture heals well," there is still no consensus on the classification, surgical indications, or even the type of surgery for this fracture. Gartland and Wewerly<sup>(16)</sup>, in 1951, revolutionized this field with their paper, which examined 1,000 fractures. Jupiter<sup>(17)</sup>, in his 1986 article in the *Journal of Bone and Joint Surgery*, emphasized the importance of reducing the fracture, shifting the discussion into a new era.

Despite the numerous papers written every year on this fracture, no consensus has been reached, and there is no sign of agreement in the near future. However, there is one area of agreement: adult fractures must be anatomically reduced. Unfortunately, no consensus exists regarding what "anatomically" means. Is a 5 mm displacement of the intra-articular fragment considered "anatomical"? Nevertheless, there is a trend toward emphasizing anatomical reduction. Vincent<sup>(18)</sup> showed that anatomical factors explained only 11% of clinical outcomes in 260 patients: most of the variation was due to differences between patients themselves.

Regarding classification, no consensus has been reached either. The World Federation of Hand Surgery Societies formed a working group of prominent figures in the treatment of distal radius fractures to investigate the existence of a consensus on the best classification. If such a consensus did not exist, they aimed to create one. The group concluded that no universally accepted consensus exists, and the group could not create such a system.

However, there is an agreement: the goal of treatment is to return the patient to their previous level of function.

### Surgical Indications and Reduction

Many authors recommend anatomical reduction, but this recommendation raises two issues. First, many patients do not need anatomical reduction to return to normal activity. Second, as mentioned earlier, the concept of anatomical reduction has not been well defined. No author suggests a 5 mm displacement as

an indication for surgical intervention; thus, a 5 mm displacement is not considered anatomical. On the other hand, a dorsal tilt of 20 degrees is also not anatomical, but inactive elderly people can return to their previous function with such a tilt.

Surgical indications for reduction are not based solely on age; rather, they must be tailored to each individual, with attention to the crucial factor of the "activity level of the patient." Care must be taken not to fall into the false belief that every elderly patient does not require anatomical reduction. Many patients in their 80s are very active, performing demanding tasks with their wrists and hands, in addition to activities like cycling, mountain climbing, and even playing tennis.

The activity level is more important than age. The goal is to restore the patient to their previous activity level. Most authors recommend anatomical reduction for active patients involved in daily work and leisure activities. On the other hand, if the patient is bedridden, less reduction will suffice to return them to their daily activities.

Attention to three important parameters is crucial:

1. **Joint surface displacement:** Many authors accept less than 1 mm but not more than 2 mm. The 2020 guidelines from the American Academy of Orthopaedic Surgeons<sup>(19)</sup> recommend surgery for non-geriatric patients (under 65 years) with a displacement greater than 2 mm. Considering both treatment principles and age, both factors should be taken into account.
2. **Dorsal tilt:** Most authors and the American Academy of Orthopaedic Surgeons guidelines<sup>(19)</sup> accept a neutral (0 degrees) dorsal tilt, but not more than 10 degrees for non-geriatric patients. The acceptable range of dorsal tilt in the scientific literature is broad, and some authors do not accept anything above 0 degrees.
3. **Radial length:** Some writings suggest 2 mm, but not more than 5 mm. Many surgeons do not accept more than 3-4 mm. The 2020 guidelines from the American Academy of Orthopaedic Surgeons recommend surgery for non-geriatric patients with a radial shortening greater than 3 mm<sup>(19)</sup>. Radial tilt is typically considered a smaller parameter.

The definition of joint surface displacement parameters is challenging. The issue lies in determining how to distinguish between less than 1 mm and greater than 1 mm. The problem is that this measurement is taken from routine radiographs, which do not allow precise measurement of a 1 mm displacement.

Few comparative studies have been conducted on dorsal tilt, but authors continue to express opinions. A dorsal tilt of 0 to 10 degrees is repeatedly mentioned, even for inactive patients.

Some inactive elderly patients with a dorsal tilt of 45 degrees or more can still manage daily tasks. Many orthopedic surgeons may encounter radiographs with severe deformities, yet some of these patients are completely satisfied with their condition and perform daily activities without issue. This raises questions about rigid thresholds for dorsal tilt, whether 0 or 10 degrees.

The scientific message regarding radial length is clear: a 2 mm shortening of radial length doubles the load on the TFCC and ulna. The clinical relevance of this fact in the case of a distal radius fracture is not entirely clear. Furthermore, changes in radial length relative to the ulna affect the function and forces applied to the distal radioulnar joint. Based on less well-known clinical criteria, most authors do not accept a radial shortening greater than 3-4 mm.

#### Considerations for Patient Age

The 2020 guidelines from the American Academy of Orthopaedic Surgeons<sup>(19)</sup> state unequivocally: "Strong evidence indicates that surgical treatment in geriatric patients (aged 65 and above) does not lead to better outcomes compared to non-surgical treatment." This statement is like a thorn in the side of experienced surgeons who have treated active elderly patients over 65 and raises questions about the use of the Short Form 36 for assessing outcome differences in active adult distal radius fractures. Many osteotomies have been performed on elderly patients over 65 who are affected by malunion. As previously stated, if the goal of treatment is to return the patient to their previous activity level, surgery should be based on this intention, not the absolute age of 65. It should not be denied that inactive patients can be fully satisfied with malunion and even a dorsal tilt of 70 degrees.

#### Stability and Fixation of Closed Reduction

Another unresolved issue is the stability and fixation of closed reduction fractures. Many believe that a

dorsal tilt of 30 degrees and any radial shortening are unstable and will eventually collapse. Others argue that a dorsal tilt of 20 degrees is a reasonable threshold. If reduction and its maintenance are necessary, surgery is capable of achieving this.

Currently, weekly radiological assessments for 3 weeks following reduction are agreed upon by all. Radiographs after 3 weeks are not necessary<sup>(20)</sup>. However, this is not correct. Radiographs are necessary for fractures that collapse during the first 3 weeks or those that appear unstable. Care should be taken to compare the most recent radiograph with the first post-reduction radiograph. If collapse is discovered later, non-union will follow, which will be very difficult to treat. Although fracture collapse is rare, orthopedic complaints are, as previously mentioned, significant, especially when collapse is detected late.

### Conservative Treatment of Distal Radius Fractures<sup>(21)</sup>

#### Indications for Conservative Treatment in Adults:

- Non-displaced extra-articular and intra-articular fractures.
- Fractures that remain stable after reduction.
- Some unstable fractures in elderly patients, where secondary displacement is asymptomatic and falls into the category of non-symptomatic malunions.

Initially, selecting fractures and separating unstable cases is important. The following parameters are considered unstable and should be observed in the initial radiographs:

1. Palmar or dorsal angle greater than 20 degrees.
2. Displacement greater than 2/3 of the shaft width in any direction.
3. Metaphyseal comminution.
4. Radial shortening greater than 5 mm.
5. Intra-articular fragment.
6. Associated ulna fractures.
7. Osteoporosis.

If there is no or minimal displacement, immobilization for 3-4 weeks is recommended. A removable splint is typically used until the patient feels comfortable, usually 4-5 weeks post-injury.

Closed reduction for displaced fractures, when radiographic evidence shows displacement, can be performed with cast control. Adequate anesthesia is important, considering the soft tissue condition. Hematoma block, intravenous anesthesia, brachial

plexus block, or general anesthesia are all suitable options. The first two methods are used for low-energy fractures without swelling.

#### Closed Reduction Technique

Closed reduction is performed by applying opposite forces responsible for the fracture. The first step is to release the fracture from its impaction by increasing deformity and then reducing the distal fragment by flexing the wrist and pronating it. Smith fractures are reduced in the supination-extension position.

#### Longitudinal Traction

Through finger traps and applying traction based on ligamentotaxis principles, impaction is released, and the fracture fragments are aligned. Although the radial and ulnar tilt are well corrected, additional palmar force is required to correct the palmar tilt, achieved by flexing the hand. This shifts the capitellum towards the palm, rotates the scaphoid and lunate, and brings the distal fragment into flexion.

#### Immobilization

Dr. Fernandez refers to the "three-point contact" technique. In this method, two contact points on the convex surface of the proximal and distal fractures, and one contact point on the concave surface of the fracture angle, are applied. Slight flexion (15-10 degrees) of the splint or cast places the soft tissue (periosteum and tendons) under tension, providing stability as long as the cortical surfaces make good contact (Figure 17).

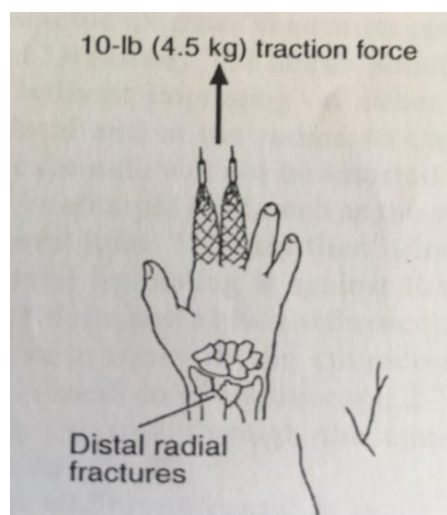


Figure 17

The fracture callus is initially placed in a splint set at 15 degrees of flexion and 25 degrees of pronation for two weeks. A Smith fracture is positioned at 30

degrees of extension and 40 degrees of supination. Radiological follow-up is performed on the 3rd, 7th, and 12th days after reduction. During this period, the initial displacement and the settling of the fracture are assessed to determine if they are acceptable. In the first two weeks, once the swelling subsides, the splint is adjusted by tightening the bandage and monitoring through radiography. This approach, which applies continuous and adequate pressure, reduces the likelihood of initial displacements. After two weeks, the splint is replaced with a short cast, keeping in mind the three-point contact method. The cast remains in place for 3 to 4 weeks.

#### When casting and closed reduction work:

Ideal scenario:

- A bending fracture with an angle of 25-30 degrees.
- Slight metaphyseal comminution on the convex surface of the angle and a simple transverse cortical fracture with good bone quality.

If a simple cortical fracture without comminution is well reduced, without misalignment of the fracture edges (especially the palmar edge of the callus fracture), and the soft tissue hinge is properly under tension, the chances of subsequent displacement are minimal. However, with increased osteoporosis, significant settling and shortening must be expected. In conclusion, for the first part on distal radius fractures, I included the device used for applying traction to reduce distal radius fractures. It may still be found at the back of storage in some hospitals, and it is known as the "Chinese Finger Trap."

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