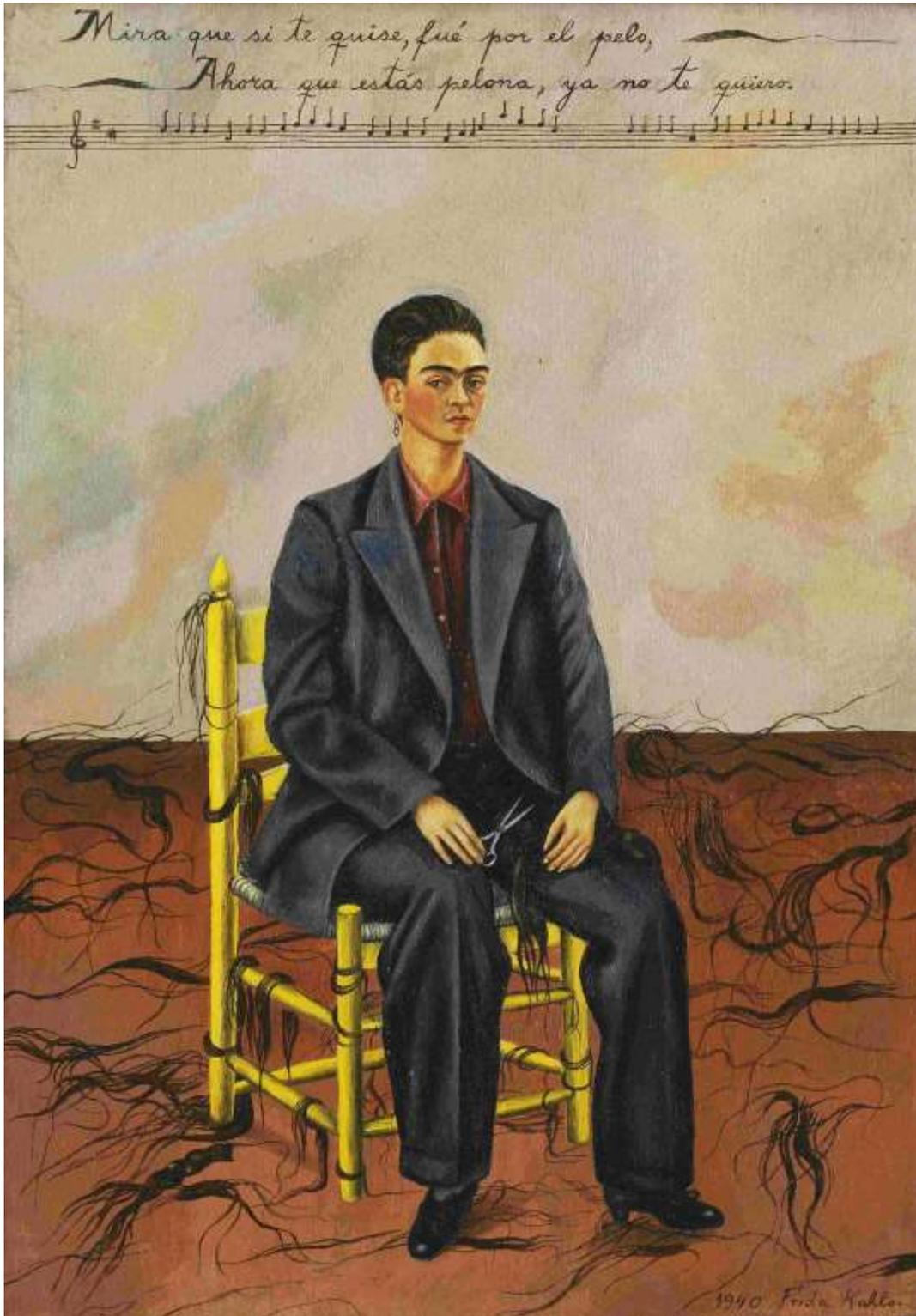


SCAHPO-LUNATE DISSOCIATION



"Self-Portrait with Cropped Hair", oil on canvas, 1940

♪♪ See if I loved you, it was for your hair; now you're bald, I don't love you anymore ♪♪

"...I have to give you bad news: I cut my hair and look just like a fairy (fairy). Well, it will grow again, I hope!..."

Frida Kahlo, letter to Nickolas Muray, 6 February, 1940.

"I never was....a faithful husband, even with Frida. As with Angelina and Lupe, I indulged my caprices and had affairs., Now moved by the extremity of Frida's condition (her ill health), I began taking stock of myself as a marriage partner. I found very little which could be said in my favour. And yet I knew that I could not change.

Once, on discovering that I was having an affair with her best friend (he means Frida's own sister, Cristina) Frida left me, only to return with somewhat diminished pride but undiminished love. I loved her too much to want to cause her suffering, and to spare her further torments, I decided to separate from her.

In the beginning, I only hinted at the idea of a divorce, but when the hints brought no response, I made the suggestion openly. Frida, who had by now recovered her health, responded calmly that she would prefer to endure anything rather than lose me completely.

The situation between us grew worse and worse. One evening, entirely on impulse, I telephoned her to plead for her consent to a divorce, and in my anxiety, fabricated a stupid and vulgar pretext. I dreaded a long heart-wrenching discussion so much that I impulsively seized on the quickest way to my end.

It worked, Frida, declared that she too wanted an immediate divorce. My "victory" quickly changed to gall in my heart. We had been married for 13 years (in reality 10 years). We still loved each other. I simply wanted to be free to carry on with any woman who caught my fancy. Yet Frida did not object to my infidelity as such. What she could not understand was my choosing women who were either unworthy of me or inferior to her. She took it as a personal humiliation to be abandoned for sluts. To let her draw any line, however, was this not to circumscribe my freedom? Or was I simply the depraved victim of my own appetite? And wasn't it merely a consoling lie to think that a divorce would put an end to Frida's suffering? Wouldn't Frida suffer even more?

During the two years we lived apart, Frida turned out some of her best work, sublimating her anguish in her painting..."

Diego Rivera, "My Art, My Life".

On the 6th of November 1938, Frida Kahlo and Diego Rivera divorced. Diego had had affairs which Frida, barely, tolerated but when he had an affair with her own sister, Cristina, in 1934, she was devastated. She still loved both Diego and her sister, however she realized that things could never be the same between her and her husband again. She stayed with Diego for another five years, before finally agreeing to a divorce. Diego did genuinely love his wife, but freely admitted that faithfulness was simply something he was not capable of.

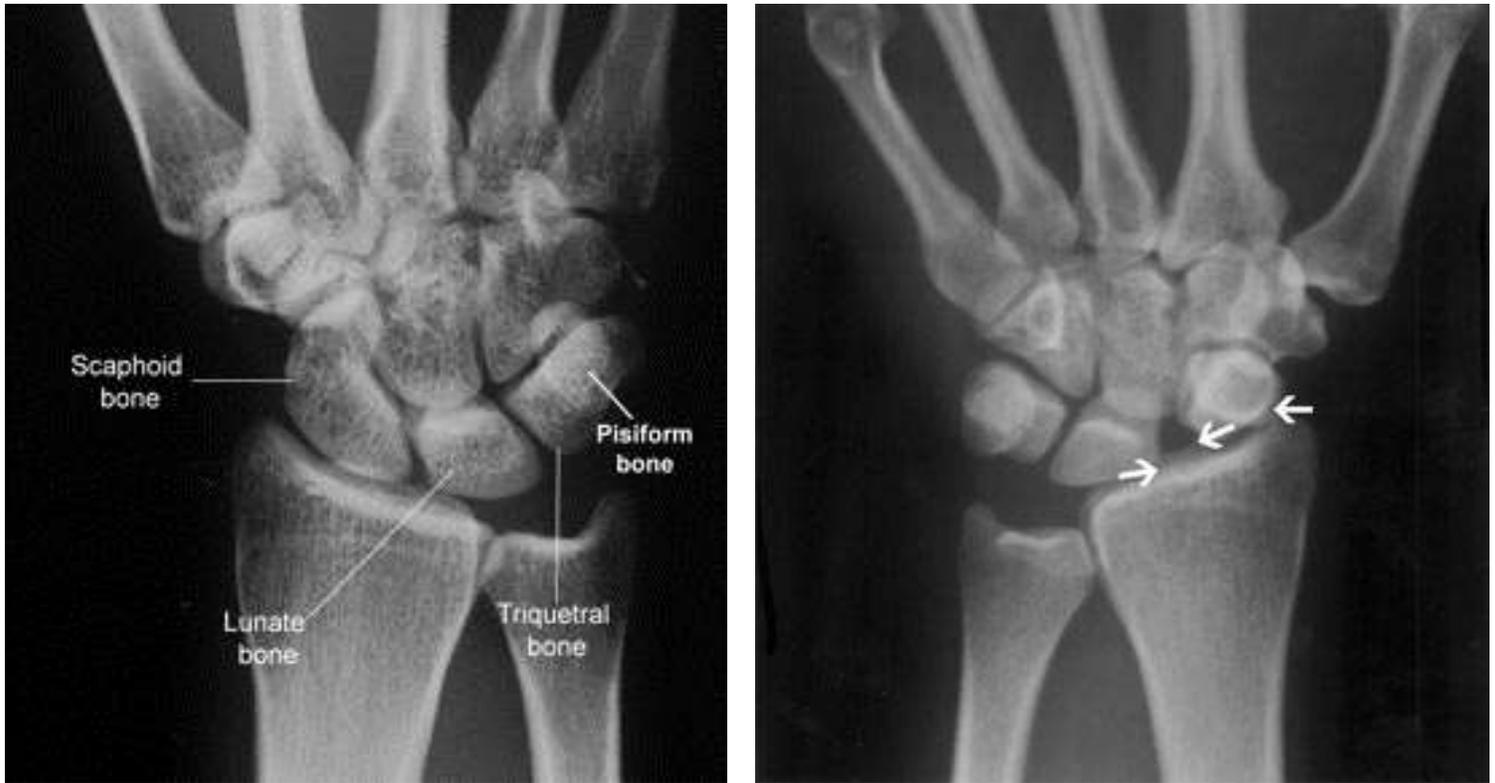
Great Art often arises from great adversity, and during the period of Frida's separation from her husband, she produced many of her best works. Frida's health had been deteriorating and she had come to rely on alcohol more and more. Some months after her divorce, she had become so depressed that she cut off all of her hair, an act which she had performed once before when she had first learnt of Diego's affair with her sister.

"Self Portrait with Cropped Hair", oil on canvas, 1940, is one of Frida Kahlo's most famous and most recognized works. Again she creates a searing self-portrait of herself. She is seated on a chair, alone in a featureless and barren place, that describes her sadness and desperate loneliness. She stares fixedly back at the viewer, hiding her distress in a clam dignity. She has discarded the outward symbols of her femininity. Gone are her bright Tehuana dresses, rings and necklaces, only a single small earring remains. She wears instead a dark coloured man's suite, an interesting echo from her youth when did enjoy dressing up as a male.

She has cut off all her hair. Above her are the words taken from a song well known at the time; "See if I loved you, it was for your hair; now you're bald, I don't love you anymore". She feels that Diego really only loved her for her feminine attributes, and now that he has rejected her, she does not even feel like a woman anymore. Her locks have an organic animated appearance that mirror the vines and jungle foliage of many of her self-portraits. Vines and ribbons are motifs that Frida frequently used to create a sense of connectedness, however here her locks are dismembered and separate. Her locks do not recede in size into the background, defying the normal rules of perspective. This gives them a floating, vital appearance, as if they were sinister crawling creatures, slithering across the floor, through the air, and entwining themselves around her chair, still seemingly alive just as the severed parts of a snake may appear immediately after cleavage from the whole. She holds the scissors across her lap, pointing them to her upper thigh, just as in her later work, now lost, "Self Portrait - Showing the Scar 1938". The scar on her leg in that work actually represents the terrible injury to her vagina, which she suffered from her bus accident of 1925. It is, Hayden Herrera, explained an image of anger and injured sexuality.

We see in the paintings of Frida Kahlo the recurring symbols of anguish and injury and it is by knowing her story that we may more readily recognize the important motifs that everywhere appear in her works. By having knowledge of the condition known as scapholunate dissociation, we may better appreciate the signs of hidden injury on plain radiography. As for Frida and Diego this injury also is one of distressing dissociation.

SCAPHO-LUNATE DISSOCIATION



PA wrist radiographs showing a normal wrist (left) and a wrist with scapholunate dissociation, (right) confirmed by the wide gap between the lunate and the scaphoid (left and center arrows) and a signet ring sign of the scaphoid (right arrow)

Introduction

Scapho-lunate dissociation refers to an abnormal orientation of the scaphoid relative to the lunate. The condition is also sometimes referred to as **rotary subluxation of the scaphoid**.

It is an important injury to recognize as it may lead to chronic disability and pain if missed.

Presentation is often delayed in the absence of an associated fractures.

Anatomy

The scapholunate ligaments:

Stability of the scapholunate joint is maintained primarily by the **scapholunate interosseous ligament**, in addition to many secondary stabilizers, including the **volar carpal ligaments** and the **dorsal capsule**.

Scapholunate dissociation is a **spectrum** of rotational abnormalities that is dependent on the severity of the injury and the resulting involvement of ligamentous abnormalities, and is one of the most common forms of carpal instability.

Mechanism

Scapholunate dissociation is caused by a fall on the outstretched hand, usually with forceful dorsiflexion.

Greater degrees of force can result in frank carpal dislocation, (lunate or perilunate dislocation).

This injury occurs with tears of the volar radiocarpal ligaments and the **scapholunate interosseous ligament** complex.

The scaphoid may then sublux by rotating vertically downwards toward the palmar surface.

Classification

Carpal instability patterns may be classified as **static** or **dynamic** based on the presence or absence of radiographically detectable abnormalities on routine studies.

Rupture of the scapholunate interosseous ligament *alone* typically results in dynamic scapholunate instability, requiring abnormal stress radiographs or motion studies to diagnose.

Rupture of at least one *additional* secondary stabilizing ligament is necessary for static scapholunate diastasis to occur, which then becomes evident on routine radiographic studies.

Complications

If not repaired there tends to be proximal migration of the capitate between the scaphoid and lunate, associated with **early** and **severe degenerative arthritis**, ultimately resulting in a condition known as “scapholunate advanced collapse” (SLAC)

This leads to **chronic disabling wrist joint instability** with **pain**.

Commonly associated fractures include scaphoid and distal radius fractures.

Clinical Features

Presentation is often delayed in the absence of associated fractures.

1. Variable pain over the dorsal wrist, usually **increased** by **dorsiflexion**.
2. Swelling is variable, depending on the severity of the injury, but is usually **minimal**.

3. Tenderness:
 - Especially localized to the dorsum of the wrist over the joint, (just distal to the radius).
4. Carpal instability:
 - Stabilize the radius with one hand and with the other push the volar tubercle of the scaphoid dorsally, pain, clicking and movement may be detected.

Investigations

Plain radiography:

Note that **absence of dissociation** does **not** exclude ligamentous injury, as lower grade injuries which result in **dynamic** instability may present with **normal** radiographic carpal alignment.

Radiological features of displacement include:

1. There is widening of the scapholunate joint space in A-P views of the wrist.
 - $> 4 \text{ mm}^5$ separation is abnormal, (the “**Terry Thomas**” sign)
 - ♥ The scapholunate interval should be measured at the **midpoint** of the **adjacent parallel articular contours** of the two bones (the scapholunate interval normally narrows proximal to distal).

See also Appendix 2

- Initial views may be normal and if the injury is suspected “stress views” may be done.

Stress views are taken with a **clenched fist**, in **ulnar deviation**, on an AP view.
 - The dynamic changes on the stress views may be further appreciated by comparison with the opposite side.
2. If there is an associated rotatory subluxation of the scaphoid, the scaphoid in the PA view will be seen end on with the cortex of the distal pole appearing as a dense ring shaped shadow over the distal scaphoid, (the “**Signet Ring**” sign.)
 - It tilts more palmar and appears shorter as it is viewed more on its end and a circular appearing cortex of bone becomes visible, producing the signet ring sign.

3. Lateral views:

- The lateral view may show a misalignment of the scaphoid and lunate, due to rupture of the scapholunate interosseous ligament

The **scaphoid** is tilted **anteriorly**, (i.e palmar) whilst the **lunate** is tilted **dorsally**, (this is known as dorsal intercalated segment instability or the “**DISI**” pattern) ^{1, 5}

- Normally on the lateral the scaphoid lies at an angle of 30 - 60 degrees forward in relation to the capitate.

In scapho-lunate dissociation with scaphoid subluxation the scaphoid is angled to the palmar surface > 60 degrees (and up to 90 degrees) in relation to the axis of the capitate, i.e. the proximal pole displaces posteriorly and the distal pole displaces anteriorly (producing the signet ring sign on the A-P views).

CT scan

This may help to confirm the diagnosis when clinical suspicion is high, despite inconclusive plain radiology.

CT is also frequently done to more fully assess the carpal bones for associated occult injury.

MRI

MRI is also a further option for confirming the diagnosis and assessing for any *associated* occult carpal bone injury.

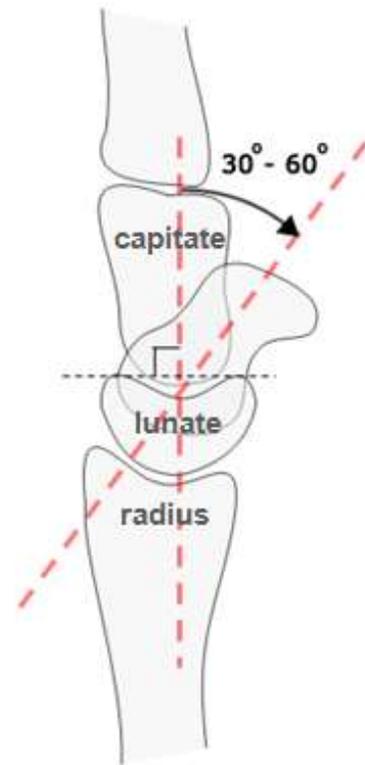
MRI has the added advantage of being able to directly assess the ligamentous injury.

Management

1. Analgesia as clinically indicated.
2. Backslab and elevation, as required.
3. Surgery:
 - **These injuries require reduction, surgical repair of the disrupted ligament and internal fixation with a kirschner wire.**

Reconstruction of the scapholunate interosseous ligament is required to prevent long-term complications, namely proximal migration of the capitate between the scaphoid and lunate with resultant degenerative disease **SLAC** (scapholunate advanced collapse) wrist.

Appendix 1



Lateral x-ray of a normal left wrist showing the relationship of the scaphoid's palmar angulation in relation to the capitate.

Appendix 2

The scapholunate interval:

The scapholunate interval is the radiographic measurement of the **scapholunate joint** on **PA wrist projections**.

Abnormal widening is indicative of injury to the **scapholunate ligament** that occurs with **scapholunate dissociation**.

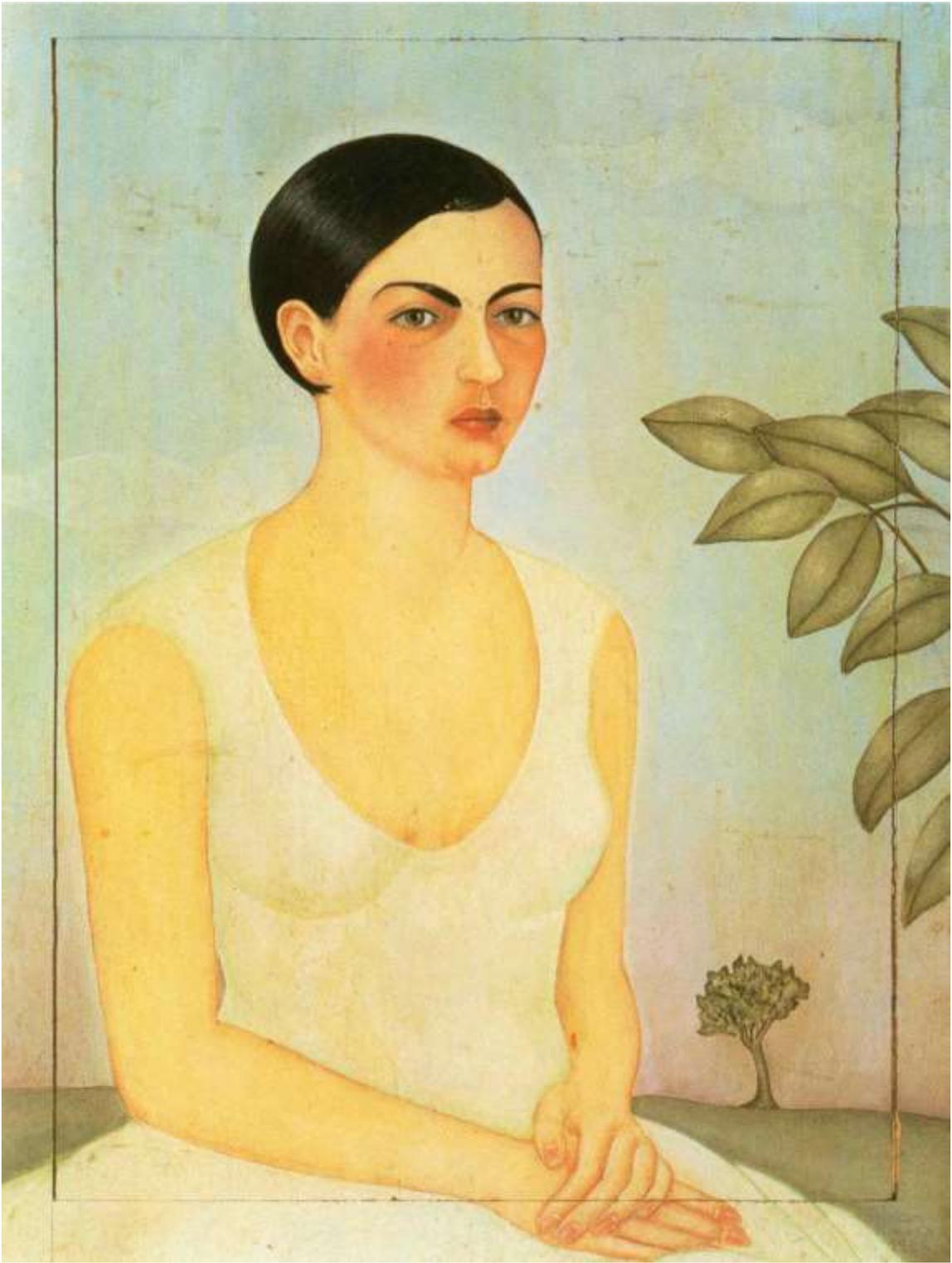
In **adults**, the normal value is generally taken as ≤ 4 mm, however there is some variability in what constitutes the “normal” value.

In **children**, the scapholunate interval is normally wider due to the large **chondral component** to the carpus.

Females have a shorter distance due to earlier skeletal maturity and reach adult values at 11 years, whereas males reach adult values at 12 years.

Approximate normal value ranges for age (female / male) reported in the literature (Owen Kang & Dr Henry Knipe in Radiopaedia) are as follows:

| Age (years) | Normal distance (mm) | Upper limit of normal range (mm) |
|-------------|----------------------|----------------------------------|
| 6 | 7 - 9 mm | 9 - 12 mm |
| 7 | 6 - 8 | 8.5 - 11 |
| 8 | 5.5 - 7.5 | 8 - 10.5 |
| 9 | 5 - 6.5 | 7.5 - 9.5 |
| 10 | 4.4 - 6 | 7 - 9 |
| 11 | 4 - 5 | 6.5 - 8 |
| 12 | 3.5 - 4.4 | 6 - 7.5 |



"Portrait of My Sister", oil on wood, 1928, Frida Kahlo



"The World of Today and Tomorrow", (Detail), Mural Fresco, Diego Rivera. 1929 - 45.

Diego Rivera's used both Frida and her sister, Cristina as models for his great mural, "The World of Today and Tomorrow" Frida is more plainly dressed as a common worker, while a more sensuous Cristina is dressed in an elegant European style. Diego's close contact with Cristina, as one of his models would lead to an affair in 1934.

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