

# Ulnar Collateral Ligament (UCL) Injury Diagnosis Using Dynamic Digital Radiography (DDR) Technology



Sarah Koles, MD, MSc, FRCPC is a Clinical Assistant Professor, Department of Radiology at the University of Calgary and a Musculoskeletal Radiologist at Beam Radiology in Calgary. She began using DDR in her clinic in 2022, incorporating it in her diagnostic imaging studies when clinically relevant. Driven by her commitment to refine DDR's clinical utility, she is using dynamic X-rays in musculoskeletal scenarios to detect subtle joint instability and malalignment across diverse joints.

## Summary/Overview

A 45-year-old right-hand dominant male presented with severe thumb pain and associated edema. Despite normal static X-rays, DDR, a recent advancement in X-ray technology that rapidly acquires sequential images to depict anatomic structures in motion, revealed a subtle joint widening during gentle radial deviation, confirming an ulnar collateral ligament (UCL) sprain. DDR's images of the joint in motion highlighted the instability and resulted in an accurate diagnosis without additional imaging.

## Approach and Use Case:

The patient experienced an injury to his right thumb while bicycling. He fell off his bicycle 3 days prior and had mild pain at the inner (medial) aspect of his right thumb at the metacarpophalangeal (MCP) joint. As a chiropractor, he was anxious that an injury would prevent him from returning to work the following day. He had full flexion and extension of his thumb without any bruising evident or altered range of motion but with tenderness at the radial deviation of the D1 MCP joint.

His static X-ray was normal and a DDR study was subsequently performed to visualize the joint in motion, revealing widening of the joint space. No avulsion fracture was present and the patient was diagnosed with a UCL sprain. A subsequent ultrasound study confirmed the diagnosis showing a thickened, sprained UCL without a tear or ossific avulsion and no Stener lesion.

The results of a low-grade UCL sprain were shared with the patient, and he was able to see the joint widening on the DDR video. This information gave him the confidence to know his injury would heal without complication. He was expected to return to work shortly with appropriate stabilization treatment.

## Discussion: Clinical and Patient Value

In this patient's case, Dr. Sarah Koles utilized DDR's motion images to detect joint instability not previously seen in static imaging. This enhanced diagnostic imaging capability allows the clinician to see what is otherwise not visible, resulting in a quicker diagnosis and intervention.



**Figure 1.** DDR image of MCP joint widening, indicating damage to the UCL



Scan or click to view

