

# Radial Collateral Ligament Injuries of the Thumb Metacarpophalangeal Joint: Epidemiology in a Military Population

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**Purpose** The reasons for variation in the reported incidence rates between thumb metacarpophalangeal joint radial collateral ligament (RCL) and ulnar collateral ligament (UCL) injuries are unclear. Delay in diagnosis of injury to the RCL leads to greater time of patient disability. The purpose of this study was to define the demographics and presentation of patients with RCL injuries in a military health care system.

**Methods** We performed a retrospective review of electronic medical records over a 5-year period to determine the incidence and epidemiology related to patients with instability of the thumb metacarpophalangeal joint resulting from injury of the radial or ulnar collateral ligaments.

**Results** A total of 56 patients presented with thumb metacarpophalangeal joint instability. Of these, 18 (32%) had an RCL injury. Patients with an RCL injury were, on average, younger than those with UCL injuries. Those with RCL injuries were more likely to require surgery than were those with UCL injuries (67% vs 40%). With regard to time to presentation, most patients with UCL injuries presented 2 to 10 weeks after injury, whereas nearly all patients with RCL injuries presented greater than 10 weeks after injury. Radial collateral ligament injuries were more likely than UCL injuries to have resulted from an axial load (56% vs 16%), whereas UCL injuries were more likely to have been caused by an abduction-adduction moment (50% vs 22%).

**Conclusions** In this series, patients sustaining injuries to the RCL were younger and presented later than their counterparts with UCL instability. Close attention to subtle or frank instability presenting as pain in younger patients with axial loading injury mechanisms may allow early diagnosis and appropriate treatment of this injury. (*J Hand Surg* 2013;38A:532–536. Copyright © 2013 by the American Society for Surgery of the Hand. All rights reserved.)

**Type of study/level of evidence** Prognostic III.

**Key words** Radial collateral ligament, thumb, instability.

**T**HUMB METACARPOPHALANGEAL (MCP) joint collateral ligament injuries are common, with most involving the ulnar collateral ligament (UCL). Radial collateral ligament (RCL) injury rates have been reported to occur within the

wide range of 7% to 42% of thumb MCP joint collateral ligament injuries.<sup>1–10</sup> The inconsistency across studies may contribute to the impression that these are uncommon injuries, which may lead to delays in diagnosis and treatment.

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The RCL is an important static stabilizer for the MCP joint during the performance of pinch and grip activities. Chronic RCL instability often leads to a predictable sequence of painful deformity resulting in articular degeneration and disability.<sup>8,11</sup>

The purpose of this study was to evaluate the incidence, presentation, and demographics of RCL injury in relation to UCL injury in our patient population. We hypothesized that the incidence of RCL tears in our population is higher than what has been previously reported.

## MATERIALS AND METHODS

We conducted an institutional review board–approved retrospective study of adult patients presenting to the orthopedic surgery service with a thumb MCP joint collateral ligament injury. This was a single military institution review of patients evaluated by a hand fellowship-trained surgeon (K.F.T.) over a 5-year period between August 2006 and August 2011. Joint instability was defined as an angular displacement from a neutral alignment of 30° or more, or a difference of 15° or more between the injured and uninjured thumb, measured on fluoroscopic stress images at 0° and 30° flexion. Inclusion criteria were age between 18 and 65 years, injury isolated to the thumb, and clinical examination consistent with thumb MCP joint instability of the RCL or UCL. Exclusion criteria were open wounds and fractures larger than a ligamentous avulsion. Surgery to repair or reconstruct ligamentous injuries was indicated in the setting of intractable pain or instability adversely affecting job performance or activities of daily living. We queried electronic medical records for International Classification of Diseases–9 codes for thumb MCP joint injuries, to determine incidence and epidemiological data to answer study objectives. The specific data points examined were the incidence of RCL injury relative to UCL injury, time from injury to presentation, patient age and sex, hand injured, and method of treatment.

We calculated *P* values using the 2-sided Fisher's exact test for dichotomous outcomes and a chi-square test for categorical outcomes with more than 2 levels. We used a 2-sided *t*-test for age analyzed on a logarithmic scale to enhance normality. We employed the 2-sided Wilcoxon test to analyze weeks from injury to presentation. Statistical significance was set at *P* < .050.

## RESULTS

A review of electronic medical records identified 1,195 patients with an injury to the thumb during the 5-year

**TABLE 1. Weeks From Injury to Presentation to Orthopedic Surgeon**

Week	All (n = 54)		RCL (n = 17)		UCL (n = 37)	
	No.	%	No.	%	No.	%
1	14	26	4	24	10	27
2–10	17	32	1	6	16	43
> 10	23	43	12	71	11	30

Weeks to presentation differed significantly between RCL and UCL (overall *P* = .008 based on chi-square with 2 degrees of freedom; *P* = .010 for 2–10 wk vs other, and *P* = .008 for > 10 wk vs ≤ 10 wk, based on 2-sided Fisher exact tests).

study period. A total of 57 subjects presented with problems consistent with collateral ligament injuries to the thumb MCP joint that met inclusion criteria. We excluded 1 subject after he was found intraoperatively to have an isolated injury to the dorsoradial joint capsule with an intact RCL. Of the remaining 56 subjects, 18 (32%) had an injury to the RCL, whereas 38 subjects (68%) had injury to the UCL, as determined by clinical examination.

There was a significant difference in patient age. The mean age of patients with RCL injuries (29 y) was significantly lower than patients with UCL injuries (35 y) (*P* = .038). There was no statistically significant effect of sex (*P* = .185) or hand laterality (*P* = .076) regarding the ligament injured. Hand dominance had no significant association with the ligament injured (*P* = .321).

There was a significant nonlinear effect for time from injury to presentation (Table 1). Approximately one quarter of both patients with RCL or UCL injuries (24% and 27%, respectively) presented to an orthopedic surgeon within the first week after the injury. Among patients seen after 1 week, most with UCL injuries were seen in weeks 2 to 10, whereas nearly all patients with RCL injuries were seen in a more delayed fashion, greater than 10 weeks (*P* = .008). Presentation beyond 10 weeks from injury resulted in a relative risk for operative treatment of 2.16 (range, 1.21–3.84; *P* = .013).

There was a significant difference in mechanism of injury between the groups (*P* = .001). Radial collateral ligament injuries were much more likely than UCL injuries to have resulted from an axial load (56% vs 16%), whereas UCL injuries were more likely than RCL injuries to have been caused by an abduction-adduction moment (Table 2). The presenting chief report among patients with RCL injury was typically that

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