

Original Research Reports

Determinants of Disability After Proximal Interphalangeal Joint Sprain or Dislocation

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Background: Sprain or dislocation of the proximal interphalangeal joint may be a useful example of the counterintuitive aspects of recovery as the prognosis is excellent, but protectiveness in response to discomfort often hinders the stretching exercises that are a key component of the recovery process. **Objective:** The aim of this study was to investigate the relationship between disability and pain self-efficacy in this context. **Methods:** A total of 82 patients (54 men and 28 women) were enrolled in this prospective study. Finger motion was measured, and the patients completed measures of upper limb-specific disability (the shortened version of the Disabilities of the Arm, Shoulder and Hand questionnaire), symptoms

of depression (Patient Health Questionnaire-9), effective coping strategies in response to pain (the Pain Self-Efficacy Questionnaire), and a pain scale at enrollment. **Results:** Patients were enrolled a mean of 48 days after injury. The final multivariable model accounting for greater disability included lower self-efficacy, greater symptoms of depression, and gender (women have more disability). Lower self-efficacy was also the strongest predictor of pain intensity and finger stiffness. **Conclusions:** Effective coping strategies such as self-efficacy facilitate recovery (less disability, pain, and stiffness) after proximal interphalangeal joint sprain/dislocation. **Level of Evidence:** Prognostic level I. (Psychosomatics 2014; 55:595–601)

INTRODUCTION

Dislocations and sprains of the proximal interphalangeal (PIP) joint are common.^{1–3} The most common adverse outcome is stiffness—insufficiency of the volar plate or a collateral ligament are much less common. Immediate mobilization is safe, and exercises to improve range of motion (stretches) aid recovery.^{4,5} Although we occasionally meet patients just after the injury, they usually present much later—between 3 weeks and 3 months after injury—when they are surprised that what often seems initially to be a relatively innocuous injury has not fully recovered in terms of pain, swelling, and stiffness.¹ Patients who are unsettled by these circumstances may protect the finger excessively, resulting in stiffness and hindering recovery.

Sprains and dislocations of the PIP joint have an excellent prognosis. Most patients eventually regain full motion and have no pain.² They regain motion by using the hand functionally and doing exercises to stretch the injured capsuloligamentous structures that tend to contract and tighten as they heal. There is a defined pathophysiology and limited, transient impairment.

And yet, in this subacute postinjury period, some patients have sufficient symptoms and disability to

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make an appointment with a hand specialist. Based on the strong relationship demonstrated between catastrophic thinking and symptoms of disability,⁶⁻⁹ we suspect that it is catastrophic thinking that brings people in: "I'm keeping it from healing," "I'm reinjuring it," "It feels like it will always hurt." The advice of the health provider is "you need to work out the tightness" and "exercises to regain motion can be uncomfortable, but it's best to think of them as a healthy stretch." This is often unexpected and runs counter to the normal initial human response to nociception ("hurt indicates harm"). In other words, recovery from PIP sprain or dislocation might be a useful example of the counter-intuitive aspects of recovery from musculoskeletal injury and illness and also of the notable lack of correspondence between pathophysiology/impairment and symptoms and disability.

The primary null hypotheses of this study were as follows: (1) there is no correlation between disability and pain self-efficacy (essentially the converse of catastrophic thinking) at initial presentation for care of a sprain or dislocation of the PIP joint; (2) there are no predictors of disability at initial presentation; (3) there are no predictors of pain intensity; (4) there are no predictors of finger motion at initial presentation; (5) there are no differences in pain intensity, disability, and pain self-efficacy when initial scores are compared with scores obtained a week after the visit.

METHODS

Study Design

We invited adult English-speaking patients visiting our hand and upper extremity practice in the Northeast of the United States with a sprain or dislocation of the PIP joint to participate in this prospective Institutional Review Board-approved study. We excluded patients who were pregnant, had severe osteoarthritis of the hand, or had a condition of the muscles or central nervous system that prohibited them from doing finger exercises. Overall, 91 patients were evaluated for enrollment between March 2011 and October 2012. Of them, 7 patients declined, 1 patient had pre-existing finger stiffness, and 1 patient was excluded because of severe osteoarthritis in the fingers. After exclusion of these 9 patients, the cohort consisted of 82 patients (28 women and 54 men). The mean age of the cohort was 42 ± 14 years (range: 18–84 y)

(Table 1). Patients were enrolled an average of 48 ± 42 days after injury (range: 2–203 d). Only 28 patients presented within 20 days of injury.

On the day of enrollment, patients completed questionnaires, and finger motion was measured. To address one of our secondary study questions, we administered the questionnaires over the phone an average of 9 ± 5 days (range: 3–34 d) after the initial visit. Eight patients were evaluated outside of the planned window of between 5 and 14 days after the initial visit. For example, a patient specifically asked us to call back after 3 days as he was going out of town and another preferred to complete the questionnaires in the office at his 34-day follow-up appointment. A total of 14 patients could not be contacted, so the follow-up information was available for 68 patients (83%).

Overall, 39 patients had a PIP sprain, 27 had a sprain with a small volar plate bony avulsion fracture, and 16 sustained a PIP dislocation. There were 4 patients who had a dislocation with volar plate avulsion fracture and we categorized them as dislocations. Most patients were injured while participating in sports (Table 1).

Evaluation

Questionnaires

At enrollment and at phone evaluation, patients completed the Pain Self-Efficacy Questionnaire (PSEQ), a measure of confidence in the ability to do things despite discomfort.¹⁰ This questionnaire contains 10 statements that can be rated from 0 (not at all confident with the statement) to 6 (completely confident with the statement), and the total scores range from 0–60.¹⁰ Patients also completed the shortened version of the Disabilities of the Arm, Shoulder and Hand questionnaire (QuickDASH), which was developed to assess upper extremity disability.^{11,12} The QuickDASH questionnaire has 11 items of the original DASH questionnaire. The questions were answered on 5-point Likert scales.

Patients also rated their pain on an ordinal scale between 0 (no pain) and 10 (the worst possible pain).

We measured extension and flexion of the PIP joint using a handheld goniometer and the distance from the fingertip to the distal palmar crease at enrollment. Patients also completed the Patient Health Questionnaire-9 (PHQ-9). This questionnaire is based

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