Presented at the American Society for Surgery of the Hand 2018 as a Podium Presentation

Paper 56: Post-Operative Recovery Trajectories Generated From a Hand Surgery Registry

Clinical Paper Session 10: Thumb CMC – Saturday, September 15, 2018, 10:12-10:17 AM

Level 2 Evidence

Authors: Orrin I Franko, William Slikker, James Saucedo

COI: Ownership Interest: SurgiSurvey, LLC (Franko)

Hypothesis

Patients frequently ask about the recovery period following elective surgical interventions, which can becritical information when planning time off work, personal travel, or other life events. Yet despite extensive literature detailing long term outcomes for common procedures, information regarding the recovery time or return to work time is often lacking. This study used a hand surgery registry to graph the recovery rate for common hand surgery procedures.

Methods

A prospective, hand surgery registry was created and updated in real time toto evaluate the recovery curves for carpal tunnel surgery, trigger finger release, 1st dorsal compartment release, basal joint surgery, metacarpal/phalangeal fractures and wrist fractures. Recovery was monitored over time and recorded as a mean QDASH Score. The term “fully recovered” was set at an average QDASH score of 15 based on the best available literature for population averages.

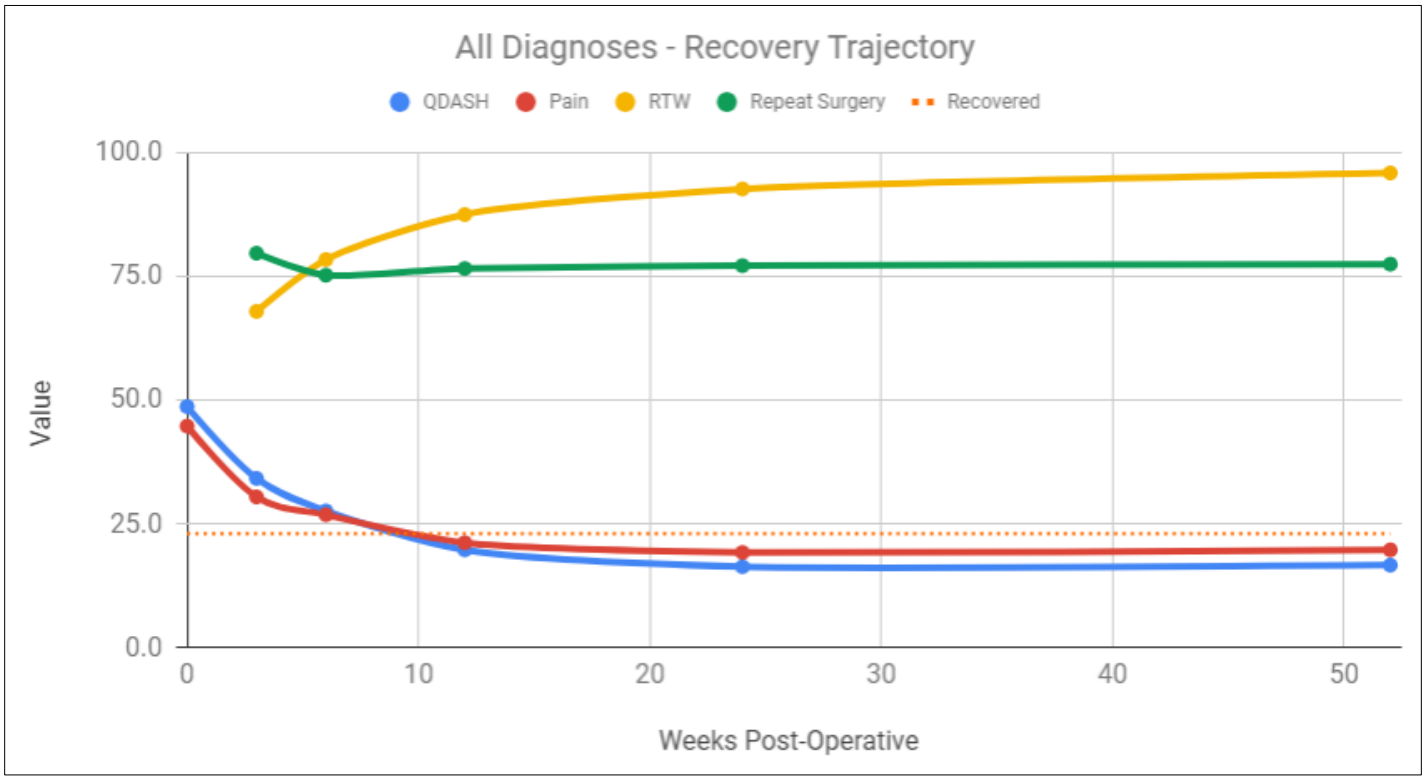
Results

The hand registry database included on-going data collection for 2,046 patients after hand surgery. A total of 990 patients met criteria for this study, and the recovery curves for each diagnosis was charted to visually demonstrate average recovery rates. With the exception of thumb basal joint surgery and DeQuervain release, all patients demonstrated consistent improvements in QDASH scores over time. Fracture patients made rapid and consistent improvements over time, with phalanx/metacarpal fractures doing better than wrist fractures. Trigger Release had the most rapid and consistent return to normal function, while carpal tunnel release never reached “normal” status even by 1 year.

Summary Points

Post-surgical recovery curves have never been previously published for some of the most common hand surgery procedures. This data can be informative for patients when planning when to schedule elective procedures and forming accurate expectations.

Research Funded by SurgiSurvey, LLC and East Bay Hand Medical Center, Inc.



Introduction: Patient education in the pre-operative setting is critical for setting appropriate expectations, earning the patient's trust, and allowing patients the autonomy to schedule around elective surgical procedures. One of the most commonly asked questions by patients relates to the "recovery period" after a procedure. Yet, somewhat surprisingly, there is limited published data reporting the average time for recovery of function, reduction in pain, return to work and overall satisfaction after common hand surgical procedures. Surgeons may often quote recovery times and return to work times after procedures on a case-by-case basis, pulling from memory and personal experience, but without specific evidence. We believe that quantifying the patient recovery experience would potentially benefit patients and surgeons alike. We created a national hand surgery database to quantify post-operative recovery compared to pre-operative values as they relate to pain, return to work, QuickDASH, and willingness to repeat surgery.

Methodology:
This study was performed after IRB approval was obtained.

Creating the database: We developed a low-cost automated system to collect electronic patient reported outcome measures (ePROs) that required minimal time investment to build and integrate into a clinical practice. We utilized existing HIPAA-compliant web-based services to create validated ePRO surveys in combination with other web-based services to send email notifications. We used a validated upper extremity outcome assessment, the Disabilities of the Arm, Shoulder, and Hand Questionnaire Short Form (QuickDASH) to reduce question burden and improve response rates. In addition, DASH has previously been validated for use in an electronic and touch screen format. We added three additional questions related to pain over the prior week (rated 0-10), if patients had returned to work (or were not employed at the time), and if patients would repeat surgery (as a surrogate for overall satisfaction).

The software was programmed to email patients at 3-, 6-, 12-, 24-, and 52-weeks from the day of surgery with a link and request to complete the ePRO. If the patient had not completed the survey within three days, an automatic reminder was sent followed by a second reminder three days afterwards, with a maximum of two reminders. At each time point the number of emails sent and surveys collected was recorded.

When patients completed an assessment, the software automatically tabulated and calculated the QuickDASH score and populated a spreadsheet for data analysis. The spreadsheet then automatically generated continuously updated reports. All scores were

Research Funded by SurgiSurvey, LLC and East Bay Hand Medical Center, Inc.

Table 1:

	# Enrolled	# at 1 yr	Recovery time (weeks)	QDASH at Surgery	QDASH at 1 yr
All Diagnoses	2898	341	9	48.7	16.7
CTR	401	40	4	49.7	14.0
TFR	298	37	4.5	41.4	13.1
DeQuervain	71	10	11	46.0	3.8
LRTI	80	18	12	49.9	17.3
Finger Fracture	130	10	9	59.0	6.1
Wrist Fracture	191	28	10	71.9	16.8

readily available in real time to review specific patient outcomes.

Patients were enrolled during standard preoperative preparation at outpatient hand surgery centers. During the preoperative nursing assessment, nurses enrolled patients using a touch-screen tablet mobile device or computer. In total, we included five hand surgery practices with 13 surgeons over a period of 21 months.

Data Analysis: All data was tabulated on Excel-format spreadsheets to facilitate analysis. Using a variety of data tabulation tools, we calculated the average QDASH scores for patients at each time point and were then able to sub-categorize groups for different diagnoses. A similar analysis was performed for pain level (rated 0-10 and converted to 0-100 for graphs), return to work, and satisfaction. Satisfaction was measured as the patient's willingness to repeat the surgery at each time point. For the purposes of this study, we elected to include only diagnoses that had enrolled at least 50 patients at the initial time period and had at least 10 patients who had completed an assessment at the final time point.

Once data was tabulated we represented them in the form of smooth line graph to easily compare recovery trends over time between diagnoses. We defined 80% improvement from the initial value to the final value at 52 weeks as "recovered."

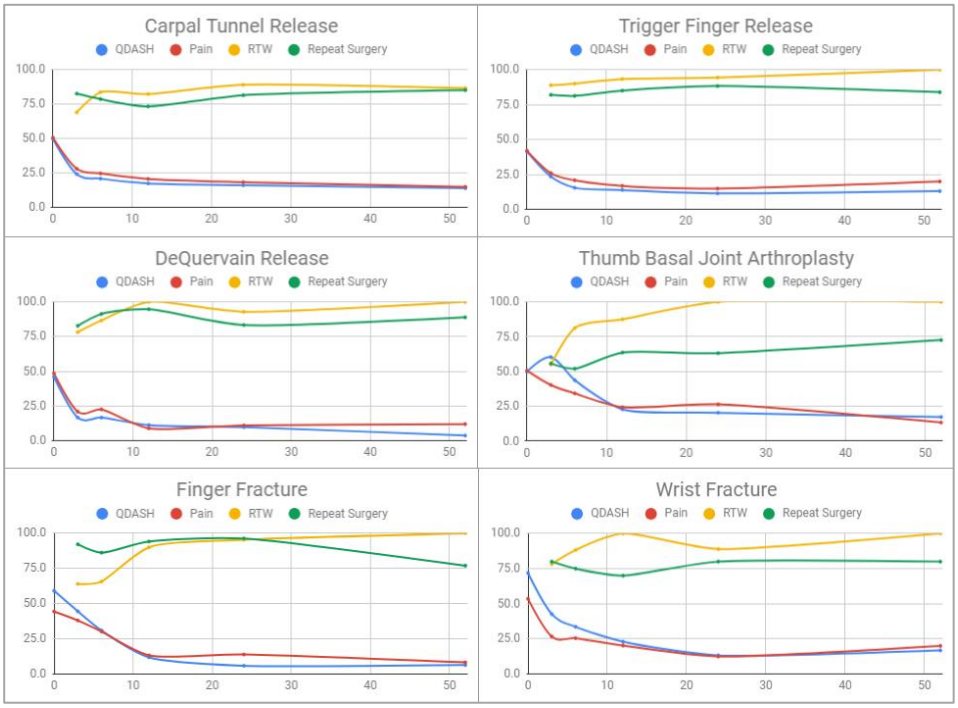
Results: A total of 2,898 patients were enrolled in the system with a total of 3,573 total responses among 1,410 patients (48.7% participation rate). Based on the number of patients enrolled and participating at each time point, we included the following diagnoses in our analysis: Carpal Tunnel Release, Trigger Finger Release, DeQuervain Release, Thumb Basal Joint Arthroplasty, Fusions (all types), Finger Fractures (all types), and Wrist Fractures (all types).

We found moderate variability among diagnoses with regards to post-operative recovery rates as they relate to QDASH function, pain scores, return to work, and desire to repeat surgery. For the entire cohort as a group, the QDASH scores progressively decreased over time and plateaued by 24 weeks post-operatively, with a recovery time of 9 weeks. QDASH and Pain scores were closely correlated throughout the recovery. The percent of patients who had returned to work increased steadily from 68% at 3 weeks, up to 96% at 1 year. The willingness to repeat surgery varied minimally from 80% at 3 weeks, and then plateaued at 75-77% through the duration of the year (Figure 1). The total number of enrolled patients, and those enrolled for each diagnosis, are shown in Table 1 as well as the initial and final QDASH scores and recovery times. Results for each diagnosis individually are shown in Figure 2.

Discussion: This study provides valuable information regarding recovery time, return to work time, pain reduction, and overall satisfaction for common procedures performed by hand surgeons in this database. The information is valuable to patients to set appropriate expectations for functional recovery, as well as surgeons who can use the data not only for patient education, but for personal benchmarking as well. In addition to the somewhat expected results, we identified previously unknown results that these authors found to be somewhat surprising.

The recovery time for carpal tunnel and trigger finger was about 4-5 weeks. Further, 80% of patients would

Research Funded by SurgiSurvey, LLC and East Bay Hand Medical Center, Inc.



elect to repeat surgery at 1 year. However, while 100% of trigger finger patients had return to work at 1 year, only 86% of employed patients undergoing carpal tunnel release had returned to work. This long-term disability rate of 14% is significant when considering a carpal tunnel release in working patients.

The recovery time for DeQuervain release was somewhat longer than carpal tunnel and trigger releases, with an estimated 80% recovery at 11 weeks. However, we attribute this to the higher initial QDASH score and lower 1-year QDASH score for these patients, representing the widest overall improvement in function. This conclusion is further supported by a return to work rate of 100% at 1 year, and the highest repeat surgery rate at 89%. We identified a slight regression in regards to pain and function at 6 weeks, reflective of a worsening overall clinical condition, that resolved by 12 weeks. This is a valuable data point that can be quite informative and reassuring to both patients and providers.

Not surprisingly, the recovery time for basal joint arthroplasty of the thumb was 3 months and continued to make modest improvements in both pain reduction and function over the subsequent 9 months. However, despite overall improvements in pain and function, the desire to repeat surgery was relatively lower at only 74% despite 100% of patients returning to work by 6 months. The reason may be explained by the initial worsening in function at 3 weeks and only very modest improvement from baseline at 6 weeks – both of which were unique to the basal joint arthroplasty recovery curve.

The recovery curves for fractures (both wrist and fingers) reflected the most rapid initial improvement over the first 12 weeks, followed by a plateau with continued improvements in return to work rates.

Altogether, we believe that this type of data is currently lacking in the literature and yet can be quite informative to both patients and providers. This study was based on a relatively small sample, but we believe that with continued data collection, the data will become more robust (more diagnoses) and more reliable (less variation).

Research Funded by SurgiSurvey, LLC and East Bay Hand Medical Center, Inc.