

Comparison of Patient-Reported Outcomes by Eaton-Littler Classifications Following Suture Suspensionplasty Treatment of Thumb Carpometacarpal Arthritis

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INTRODUCTION:

We hypothesized that there would be no differences in patient-reported outcomes (PROs) following suture suspensionplasty treatment of CMC arthritis between the different stages of Eaton-Littler classifications.

METHODS:

Patients who received primary CMC arthroplasty using suture suspensionplasty between 2018–2022 were identified. Exclusion criteria included complicated postoperative course and incomplete PROs. PROs were prospectively collected and retrospectively reviewed. Patient-Reported Wrist and Hand Evaluations (PRWHE) and Single Assessment Numeric Evaluations (SANE) were collected at baseline, 6-weeks, 3-months, and 6-months. Eaton-Littler classification was determined through blinded radiographic review by the senior author. PROs at each collection timepoint were compared between the different Eaton-Littler classification cohorts. Statistical analyses included descriptive, t-tests, chi-squared, Analysis of Variance, Fisher Exact, and Mann-Whitney U tests.

RESULTS:

142 patients were included. 58 (40.8%) patients were in the stage 2 cohort, 60 (42.3%) were in the stage 3 cohort, and 24 (16.9%) were in the stage 4 cohort. No patients were classified as stage 1. Average baseline PRWHE for the stage 2 cohort was 62.8±16.4 with a decrease (symptom improvement) of -15.5±24.0 at 6-weeks, -28.1±21.2 at 3-months, and -41.2±22.3 at 6-months. Average baseline PRWHEs for the stage 3 cohort was 64.8±18.3 with a change of -21.2±23.8 at 6-weeks, -33.5±24.6 at 3-months, and -50.4±23.4 at 6-months. For the stage 4 cohort, average baseline PRWHE was 59.5±20.8 with a change of -17.4±24.0 at 6-weeks, -35.2±24.0 at 3-months, and -46.5±24.2 at 6-months. No differences in changes in PRWHEs between cohorts were statistically significant.

Average baseline SANE score for the stage 2 cohort was 47.4±21.3 with an increase (functional improvement) of 2.3±30.7 at 6-weeks, 18.3±32.4 at 3-months, and 30.3±31.1 at 6-months. Average baseline SANE score for the stage 3 cohort was 44.0±21.5 with an improvement of 12.0±26.5 at 6-weeks, 26.4±26.3 at 3-months, and 38.4±31.1 at 6-months. For the stage 4 cohort, average baseline SANE was 40.0±20.3 with an improvement of 24.2±32.3 at 6-weeks, 37.5±27.9 at 3-months, and 44.3±30.1 at 6-months. Differences in SANE scores between cohorts were statistically significant at 6-weeks and 3-months (p=0.008, p=0.025, respectively). No other significant effects were found.

DISCUSSION AND CONCLUSION:

Suture suspensionplasty is an effective treatment for CMC arthritis that optimizes PROs for those with Eaton-Littler classification stages 2-4. PRWHE and SANE scores demonstrated that patient symptoms and functionality, respectively, improved following suspensionplasty up to 6-months postoperatively. Suture suspensionplasty is a valuable treatment option for patients with CMC arthritis stages 2-4.

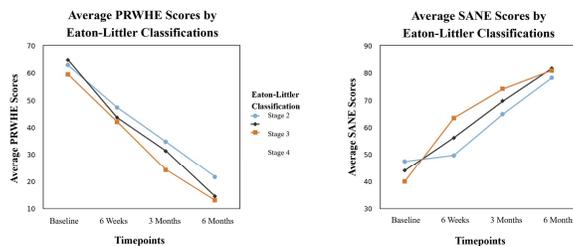


Figure 1. Line graphs depicting the average PRWHE and SANE score trends between the different cohorts of Eaton-Littler classification stages over the 6-month follow-up period. Decreasing PRWHE scores indicate the patient's perceived symptom improvement, while increasing SANE scores represent the patient's perceived functional improvement. PRWHE = Patient-Reported Wrist and Hand Evaluation; SANE = Single Assessment Numeric Evaluation.

| Table 1. Patient Demographics, Surgical Characteristics, & Patient-Reported Outcomes | | | | |
|--|--|--|--|---------|
| | Eaton-Littler Classification: STAGE 2 (N=58) | Eaton-Littler Classification: STAGE 3 (N=60) | Eaton-Littler Classification: STAGE 4 (N=24) | p-Value |
| Age (years) | 63.3 ± 7.1 | 63.9 ± 7.7 | 62.0 ± 7.2 | 0.555 |
| Sex | | | | 0.707 |
| Male | 17 (29.3) | 15 (25.0) | 5 (20.8) | |
| Female | 41 (70.7) | 45 (75.0) | 19 (79.2) | |
| Smoking Status | | | | 0.954 |
| Never | 29 (50.0) | 35 (58.3) | 16 (66.7) | |
| Former | 22 (37.9) | 20 (33.3) | 8 (33.3) | |
| Current | 6 (10.3) | 5 (8.3) | 0 (0.0) | |
| Never Assessed | 1 (1.7) | 0 (0.0) | 0 (0.0) | |
| Type of Anesthesia | | | | 0.376 |
| Intra-articular Block | 13 (22.4) | 9 (15.0) | 6 (25.0) | |
| Supraorbital Nerve Block | 37 (63.8) | 47 (77.5) | 15 (62.5) | |
| MAC ¹ Local | 1 (1.7) | 3 (5.0) | 0 (0.0) | |
| MAC ¹ Plus Block | 1 (1.7) | 0 (0.0) | 2 (8.3) | |
| General | 0 (0.0) | 1 (1.7) | 1 (4.2) | |
| Dominant Hand | | | | 0.721 |
| Right | 52 (89.7) | 52 (86.7) | 20 (83.3) | |
| Left | 6 (10.3) | 8 (13.3) | 4 (16.7) | |
| Operation on Dominant Hand | | | | 0.483 |
| No | 28 (48.3) | 30 (50.0) | 15 (62.5) | |
| Yes | 30 (51.7) | 30 (50.0) | 9 (37.5) | |
| Total Operative Time (minutes) | 72.4 ± 23.4 | 69.4 ± 22.5 | 72.2 ± 25.7 | 0.769 |
| Opioid Medication Prescription | | | | 0.931 |
| Oxycodone | 35 (60.3) | 37 (61.7) | 13 (54.2) | |
| Norco | 10 (17.2) | 11 (18.3) | 4 (16.7) | |
| Hydrocodone | 4 (6.9) | 5 (8.3) | 3 (12.5) | |
| Tramadol | 3 (5.2) | 5 (8.3) | 1 (4.2) | |
| Percocet | 3 (5.2) | 2 (3.3) | 2 (8.3) | |
| Acetaminophen-Codine | 1 (1.7) | 0 (0.0) | 1 (4.2) | |
| None | 2 (3.4) | 0 (0.0) | 0 (0.0) | |
| Pill Medication Quantity | 28.8 ± 7.3 | 24.1 ± 6.5 | 24.4 ± 6.2 | 0.870 |
| Prescribed MMPE ² | 152.3 ± 87.7 | 107.9 ± 115.1 | 116.5 ± 74.9 | 0.082 |
| Additional Procedures | | | | 1.000 |
| Corticosteroid injection | 3 (5.2) | 0 (0.0) | 0 (0.0) | |
| Hemi-trapezoidectomy | 2 (3.4) | 1 (1.7) | 0 (0.0) | |
| None | 53 (91.4) | 59 (98.3) | 24 (100.0) | |
| Respiration within 6 Months | | | | 0.707 |
| No | 58 (100.0) | 60 (100.0) | 24 (100.0) | |
| Yes | 0 (0.0) | 0 (0.0) | 0 (0.0) | |
| Patient-Reported Outcomes | | | | |
| Average Baseline PRWHE ³ | 62.8 ± 16.4 | 64.8 ± 18.3 | 59.5 ± 20.8 | 0.473 |
| Average Change in PRWHE ³ at 6 Weeks | -15.5 ± 24.0 | -21.2 ± 23.8 | -17.4 ± 24.0 | 0.424 |
| Average Change in PRWHE ³ at 3 Months | -28.1 ± 21.2 | -33.5 ± 24.6 | -35.2 ± 24.0 | 0.322 |
| Average Change in PRWHE ³ at 6 Months | -41.2 ± 22.3 | -50.4 ± 23.4 | -46.5 ± 24.2 | 0.100 |
| Average Baseline SANE ⁴ | 47.4 ± 21.3 | 44.0 ± 21.5 | 40.0 ± 20.3 | 0.357 |
| Average Change in SANE ⁴ at 6 Weeks | 2.3 ± 30.7 | 12.0 ± 26.5 | 24.2 ± 32.3 | 0.008 |
| Average Change in SANE ⁴ at 3 Months | 18.3 ± 32.4 | 26.4 ± 26.3 | 37.5 ± 27.9 | 0.025 |
| Average Change in SANE ⁴ at 6 Months | 30.3 ± 31.1 | 38.4 ± 31.1 | 44.3 ± 30.1 | 0.134 |

¹MAC = Monitored Anesthesia Care; ²MMPE = Morphine Milligram Equivalent; ³PRWHE = Patient-Reported Wrist and Hand Evaluation; ⁴SANE = Single Assessment Numeric Evaluation.