

# Early Active Range of Motion Protocol Following Upper Extremity Tendon Transfers Does Not Increase the Risk of Postoperative Complications

Saggaf M<sup>1,2,3</sup>, Haas JP<sup>3</sup>, Novak CB<sup>1</sup>, McCabe SJ<sup>1,3</sup>, Anastakis DJ<sup>1,3,4</sup>

<sup>1</sup> Division of Plastic, Reconstructive and Aesthetic Surgery, Department of Surgery, University of Toronto, Toronto, Ontario, Canada <sup>2</sup> Institute of Health Policy, Management and Evaluation, University of Toronto, Toronto, Ontario, Canada

<sup>3</sup> Toronto Western Hospital, University Health Network, Toronto, Ontario, Canada <sup>4</sup> Krembil Research Institute, Toronto Western Hospital, University Health Network, Toronto, Ontario, Canada

## Background

- The effect of early active range of motion (EAROM) protocols following upper extremity tendon transfer is not well defined across multiple types of tendon transfers.
- The study aim was to compare the postoperative complication rates between patients treated with EAROM protocols compared to delayed mobilization following tendon transfers.

## Methods

- Retrospective cohort study design.
- Inclusion criteria:** Adults who had upper extremity tendon transfer procedures performed by a single surgeon at a tertiary care center.
- Exclusion criteria:** Patients with upper motor neuron lesions, psychiatric disorders affecting participation in rehabilitation, previous tendon transfers, and follow-up less than 12 weeks
- Classification:** Based on the day of EAROM following surgery; **EAROM group** ≤7 days, and **delayed mobilization group** > 7 days
- Primary outcome:** Postoperative complications variable included tendon rupture, reoperation to readjust tension and tendon adhesions requiring tenolysis
- Propensity scores were derived from a logistic regression model using the average of treatment effect.
- Inverse probability of treatment weighting (IPTW) was used to estimate the adjusted relative risk for postoperative complications.
- Adjusted for age, sex, comorbidities, occupation, smoking status, traumatic injuries, nerve injuries, type of tendon transfer and method of repair.
- The study was powered to detect a medium effect size.
- Institutional REB approval.

## Results

- Study included 141 patients: EAROM group (n=74) and delayed mobilization group (n=67).
- Overall median postoperative follow-up = 7 months (IQR=14.9 months).
- Incidence of postoperative complications:
  - EAROM group 8.1% (n=6)
  - Delayed mobilization group 6% (n= 4)
- In the adjusted analysis using IPTW, the relative risk for major postoperative complications in the EAROM group was **2.1 (95% CI: 0.6 – 8.1, p=0.28)**.

**Table 1: Baseline Characteristics of the Study Participants**

Variable	Total (N = 141)	EAROM (N = 74)	Delayed Mobilization (N = 67)	SMD (VR)
Age	49.2 (17.3)	50.5 (18.8)	47.7 (15.4)	0.10 (1.3)
Sex = Male	92 (65.2%)	44 (59.5%)	48 (71.6%)	0.05
Employed	97 (68.8%)	45 (60.8%)	52 (77.6%)	0.05
Active Smoker	37 (26.2%)	19 (25.7%)	18 (26.9%)	0.05
Traumatic	70 (50.7%)	37 (50.0%)	33 (51.6%)	0.05
Nerve Injury	69 (48.9%)	30 (40.5%)	39 (58.2%)	0.02
Tendon Injury	47 (33.3%)	32 (43.2%)	15 (22.4%)	0.02
Combined Injuries	25 (17.7%)	12 (16.2%)	13 (19.4%)	NA

SMD: Standardized mean difference. VR: Variance ratio for continuous variables.

**Table 2: Types of Tendon Transfers**

Surgery	Overall	EAROM	Delayed Mobilization
Transfers for Radial Nerve Palsy	15 (10.6%)	7 (9.5%)	8 (11.9%)
Opponensplasty	43 (30.5%)	22 (29.7%)	21 (31.3%)
Side to Side or End to Side	24 (17.0%)	12 (16.2%)	12 (17.9%)
Transfers to the Finger Flexors			
Isolated Tendon Transfers to EPL	22 (15.6%)	16 (21.6%)	6 (9.0%)
Static Tendon Transfers	14 (9.9%)	9 (12.2%)	5 (7.5%)

Dependent Variable: Post-intervention CISS Scores. R<sup>2</sup> = 0.48, adjusted R<sup>2</sup> = 0.42

## Conclusion

- The overall incidence of postoperative complications was low in this large series.
- EAROM was not largely associated with an increased risk of major postoperative complications.

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