Appendix1

Data Collection Tools

For data collection, Goniometer, Visual Analog Scale, Box and Block, Purdue Pegboard, dynamometer and pinch gauge were used in order to measure ROM (TAM), pain, dexterity, grip and pinch strength, respectively. These measurement tools are explained below.

Goniometer: The goniometer, a fundamental tool in orthopedic assessments, played a pivotal role in this study for precise measurement of joint range of motion. This device provided objective and standardized data, allowing clinicians to quantify the degree of flexion and extension in metacarpophalangeal, phalangeal, and wrist joints. By ensuring consistency in the evaluation of joint mobility, the goniometer served as a reliable instrument in tracking the progress of participants undergoing different rehabilitation protocols.

Visual Analog Scale (VAS): Pain assessment is paramount in postoperative care, and the Visual Analog Scale (VAS) was the chosen instrument for this study. Participants subjectively rated their pain levels on a continuous scale, providing a measurable indicator of discomfort. The VAS offered a standardized method to capture the nuanced variations in pain experienced by individuals undergoing flexor tendon repair. This tool contributed to a comprehensive understanding of pain dynamics throughout the intervention and follow-up periods.

Dexterity Assessments (Box and Block Test (BBT), Purdue Pegboard Test (PPT)): Fine and gross motor skills were evaluated using dexterity assessments, including the BBT (injured hand) and Purdue Pegboard (injured hand, both hands and assembly) tests. These tools provided objective measures of hand coordination, precision, and speed. By systematically assessing dexterity at different time points, the study aimed to discern the impact of rehabilitation protocols on the participants' ability to perform intricate and coordinated hand movements, offering a quantitative dimension to the overall functional outcomes.

To conduct the BBT, a wooden box (53.7 × 25.4 × 8.5 cm) which is divided into two compartments by a partition, with 150 small blocks (2.5 cm cubes) placed in one side is used. The seated participant moves as many blocks as possible, one at a time, from the filled compartment to the opposite side within 60 seconds, using only the tested hand. The total number of blocks successfully transferred is recorded. Higher scores indicate better manual dexterity.

In order to administer the PPT, patient is seated comfortably with the board placed horizontally in front of them. The board consists of two parallel rows of 25 holes and four cups at the top: the outer cups

hold metal pins (25 each), while the inner cups contain washers (left) and collars (right). The clinician first demonstrates and then administers five tasks: (1) Right Hand (30 sec): inserting pins into the right column using only the right hand; (2) Left Hand (30 sec): repeating the task with the left hand for the left column; (3) Both Hands (30 sec): placing pins simultaneously into both columns; (4) Combined Score, calculated as the sum of the three previous tasks; and (5) Assembly (60 sec): constructing units by combining pins, washers, and collars using both hands. Scoring reflects the total pins placed (tasks 1–3) or components assembled (task 5), with norms adjusted for age and gender.

Power Grip and Pinch Tests: Understanding the strength and grip capabilities of participants was facilitated through Power Grip and Pinch tests. These assessments provided quantitative data on the force exerted during power grip and pinch activities. By incorporating these measures, the study sought to elucidate the impact of rehabilitation protocols on the participants' hand strength, offering insights into the recovery of grip functionality following flexor tendon repair.

Splints figures:

Figure S1: The custom made tenodesis splint used in early active protocol during exercises.

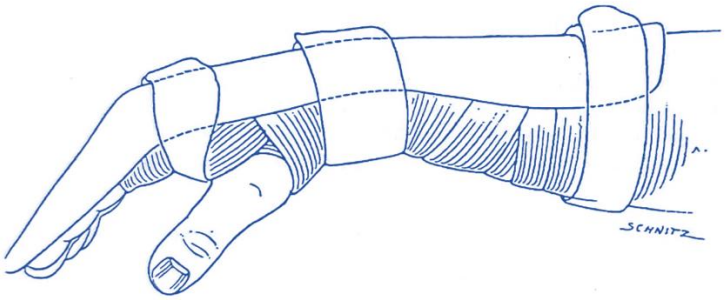

Figure S2 : The Dorsal block splint used in Modified Duran (passive motion) protocol. From Hand and upper extremity rehabilitation: a practical guide, 4th Ed Elsevier,2015.