Examination of Flexor Tenolysis After Flexor Tendon Repair Following Early Active Mobilization

Koji Moriya, M.D., Takae Yoshizu, M.D., Naoto Tsubokawa, M.D., Hiroko Narisawa, M.D. and Yutaka Maki, M.D.

Niigata Hand Surgery Foundation, Niigata, Japan

Introduction:
Several patients still experience loss of active flexion of the digits due to adhesion after adequate postoperative early active motion mobilization (EAM), it gives rise to delayed treatment such as flexor tenolysis. (Hernandez T. Hand 15, 2012.)

Purpose:
To examine patients requiring flexor tenolysis after primary tendon repair using a six-strand suture with the Yoshizu #1 technique with EAM.

Methods:
- This study was a retrospective review of a case series.
- A total of 148 fingers of 132 consecutive patients with complete zone 1 or 2 flexor digitorum profundus (FDP) lacerations were treated using the Yoshizu #1 technique, followed by EAM, between 1993 and 2017.
- Primary repair of a flexor tendon injury and postoperative digit rehabilitation of EAM underwent by a relatively uniform method that we have described previously.
- Patient demographics and injury details were retrieved from hospital records.

Surgical methods of flexor tenolysis
Under wrist block combined with digital block with a pneumatic tourniquet.
- The flexor tendon sheath was entirely exposed from the unaffected area to the affected area.
- The synovial sheath of both flexors was incised proximal to the A1 pulley for assessing the condition of adhesion between the FDS and the FDP tendons.
- Whenever possible, only the FDP tendon was freed from around tissues such as the FDS and the preserved sheath.
- The digital fibrous flexor sheath was opened, raising multiple small sheath flaps of a few mm in width from the intact area to the scarred area.

Results:
- Seven fingers (4.7%) in seven patients needed flexor tenolysis (all in zone 2).
- The patients comprised 7 males of mean age of 43 (range, 19–56) years at the time of the injury.
- The injuries involved two index, two middle, and three little fingers.
- According to Tang’s subdivisions of zone 2, three fingers had zone 2a injuries, two zone 2b injuries, and two zone 2c injuries.
- Two fingers, one each in zones 2a to 2b, underwent flexor tenolysis 4 and 6 weeks after the primary surgery because of suspected flexor tendon rupture during postoperative EAM. After flexor tenolysis, these patients remained on the EAM protocol.
- The remaining five patients underwent flexor tenolysis from 12 to 24 (average, 18) weeks after primary tendon repair and followed the Foucher-type rehabilitation protocol after flexor tenolysis.
- Cross adhesions between the repaired FDS and FDP tendons occurred in six digits in six patients. The remaining one FDP tendon adhered underneath pulleys distal from the repair site.
- All adhesions were categorized as moderate according to Tang’s type of adhesion.
- Active range of motion (AROM) of the PIP and DIP joints at follow-up averaged 123° (range: 57–180°). Excluding the two fingers that underwent early flexor tenolysis, the average preoperative AROM of the PIP and DIP joints was 82° (range: 30–130°), increasing to 111° (range: 57–135°) at the final evaluation.

Summary points:
- Five percent of patients undergoing primary flexor tendon repair following EAM may require flexor tenolysis. Timing of tenolysis was divided into two stages (i.e. early and late).
- Adhesions were usually observed between the repaired FDS and FDP tendons, but never extended proximal to the repair site. All adhesions were categorized as moderate.
- This series of tenolysis has given an increased AROM of the PIP and DIP joints from 82° to 111° excluding the two fingers that underwent early flexor tenolysis, however the improvements were not as good as we had expected.
- Based on these less favorable outcomes, we believe that recovery of AROM during EAM is crucial for acquiring good outcomes after flexor tendon repairs.