

evidence, and ignored level IV evidence. The benefits of the true active motion have been clearly observed and reported in the leading centers of flexor tendon repair around the world with large series of level IV evidence (Giesen et al., 2018; Higgins et al., 2010; Lalonde, 2013; 2017; Khor et al., 2016; Moriya et al., 2017; 2019; Reissner et al., 2018; Tang et al., 2017, Tang, 2018, Zhou et al., 2017). Observations of flexor tendon repair with WALANT and the improved results obtained by the surgeons demonstrated in the large series using true active movement leave me convinced that it is only a matter of time that level III evidence will surface which proves that true active movement is superior to full fist place and hold regimes.

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Dear Editor,

## Our tenolysis rate after zone 2 flexor tendon repairs and modified Duran passive motion protocol over the past 3 years

From November 2015 to December 2018, we performed zone 2 flexor tendon repairs in 34 patients aged 15 to 65 years old. A total of 43 flexor digitorum profundus tendons were repaired in either a primary or delayed primary manner using modified Kessler and Bunnell repair methods. The flexor digitorum superficialis tendons were repaired when possible. We did not specifically record the venting of the pulleys.

These patients underwent pure passive motion protocols after surgery according to the modified Duran protocol. No active flexion components were added until postoperative week 3. The rehabilitation continued for 8 to 12 weeks after surgery. Tenolysis was indicated if the injured fingers did not recover at least 40–50% of the normal range of interphalangeal joint active motion by 6 months after surgery. Not all of our patients with less than 50% of motion recovery wanted to have tenolysis. Consequently, 10 out of 43 fingers (23%) had tenolysis.

In the study period, 97 patients had thumb or finger flexor tendon repairs, among which nine had isolated flexor pollicis longus tendon repairs from zone 1 to 5, and 88 patients had finger flexor tendon repairs from zone 1 to 5. Two thumbs with flexor pollicis longus tendon repairs had tenolysis. Excluding zone 2 repairs in fingers, 54 patients had finger flexor tendon repairs in zone 1, 3 or 5; six patients had tenolysis. The tenolysis incidence after repair of zone 1, 3 and 5 finger flexor tendons was lower than that after zone 2 repair.

Tenolysis documented in this case series followed a true passive motion protocol with recovery of no or inadequate flexion. We repaired the flexor digitorum superficialis in most cases of zone 2 lacerations. A recent report highlights the rather low excellent and good incidence of zone 1 and 2 repairs after Kleinert rubber band traction, whether or not active flexion components were added (Rigó et al., 2017). Recent reports of multi-strand repair methods and early

active motion (Giesen et al., 2018; Lalonde, 2017; Moriya et al., 2015, 2017; Pan et al., 2017, 2019; Reissner et al., 2018; Tang 2007; 2014) raise concerns regarding placement of knots between the cut tendon surfaces (Chen et al., 2018). These authors have suggested that a multi-strand repair and true active flexion should be used, the repair should be tensioned and knots should not be placed between the tendon ends. These measures are shown to decrease tenolysis rate.

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