Tendon Rupture Following Distal Radius Volar Plating

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**Objectives**

- The purpose of this study was to assess current hand surgeon experience with tendon rupture following volar plating of distal radius fractures.
- A 2013 systematic review reported only 47 available cases of flexor tendon rupture following distal radius volar plating in 21 published studies.3
- From clinical experience, we hypothesized that tendon rupture after volar plating is more common than one might expect based on review of the current literature.

**Methods**

This was an online-based survey study. After approval by the institutional review board and the American Society for Surgery of the Hand (ASSH) administration, the senior author (JL) sent an electronic mail request to all members (n = 3,022) of the ASSH. The survey totaled 12 questions and requested responses that reflected the past year of clinical practice. Responses were recorded for eight weeks following the initial request, with a reminder notification sent at four weeks. Descriptive statistics analyzed 596 responses, yielding a response rate of 20%.

**Results**

- DEMOGRAPHICS: The majority of respondents 334 (56%) were hand surgeons in practice over 15 years. 83 (14%) reported being in practice between 10-14 years and the remaining 179 (30%) reported being in practice less than 10 years.
- Use of INTERNAL FIXATION: 575 (96%) responding surgeons used at least one volar plate to treat a distal radius fracture over the past year, while only 303 (51%) used at least one dorsal plate over the same time period.
- PRACTICE OF PLATE REMOVAL: 3.4% surgeons routinely removed volar plates, while 45 (<8%) never removed volar plates. 547 (92%) indicated plate removal for symptomatic and/or malpositioned hardware. At least 810 plates were reportedly removed for tendon irritation/rupture over the study period.
- ASSESSMENT OF PLATE LOCATION: 20% of responding surgeons did not assess/recall plate location with respect to the watershed line. Removed plates were recalled to be positioned proximal, distal and at the watershed line approximately 21% (170), 43% (347) and 16% (129) of the time, respectively. The Soong Grade was not used by 204 (34%) responding surgeons. Plates removed and graded were 0; 1 or 2, in 17%, 45% and 39% of cases, respectively.
- FLEXOR TENDON RUPTURES: 199 (33%) surgeons managed 294 patients with flexor tendon rupture complications following volar plating. 33% complete tendons were ruptured, with the Flexor Pollicis Longus (EPL) most commonly injured in 254 cases (75%). Index Flexor Digitorum Profundus (FDP) was the second most ruptured tendon in 61 cases (18%).
- EXTENSOR red TENDON RUPTURES: 324 patients reportedly experienced approximately 354 extensor tendon ruptures. Extensor Pollicis Longus (EPL) was most commonly ruptured in 259 cases (73%), followed by Extensor Digitorum Communis (EDC) 65 (18%) and Extensor Indicis Proprius (EIP) 30 (8%).
- TREATMENT: Flexor injuries were most often managed with 118 Palmaris Longus (PL) grafts (37%) followed by 114 tendon transfers (36%). Primary repair, joint arthrodesis and tenodesis were also reported. Extensor injuries were most often managed with tendon transfer 317 (88%).

**Conclusions**

- While not extensively reported, the current survey responses suggest both flexor and extensor tendon ruptures can occur following volar plating of distal radius fractures at a rate that may be higher than previously reported.
- Surgeons should have a high index of suspicion for this complication when clinical symptoms are suggestive of tendon irritation during follow-up.
- Systematic scrutiny of plate position on radiographic images may assist with identifying patients at risk for tendon rupture following volar plating, yet not all hand surgeons report consistently using these methods.
- Tendon transfer appears to be helpful in managing tendon rupture following volar plating.
- Future studies should aim to identify additional risk factors and to optimize treatment strategies for tendon rupture following volar plating of distal radius fractures.