A Cadaveric Study of a Device and Technique for Minimally Invasive Trigger Finger Release

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Introduction

Repetitive strain disorders including Trigger Finger are the fastest growing category of work-related illness; accounting for 56 percent of illnesses according to the most recent report from the U.S. Bureau of Labor Statistics. Trigger finger involves a painful catching or popping of the involved flexor tendon as the patient flexes and extends the digit. Trigger finger has been treated by both open and percutaneous division of the A1 pulley. An open approach allows for greater visualization yet requires more extensive use of hospital resources and results in a longer recovery time for patients. This cadaver study was designed to evaluate the safety and efficacy of a device developed for trigger finger release.

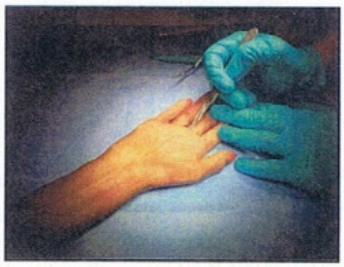

Figure 1: Transverse stab incision at the metacarpophalangeal crease.

Methods

LB is a 35-year-old female with history of Morquio's syndrome. A device has been developed for dividing the A1 pulley that protects the tendon and the neurovascular bundles. A transverse stab incision was made at the metacarpophalangeal crease and soft tissue bluntly dissected to visualize the tendon. The tool features a unique guide and blade system that protects the tendon and soft tissues while cutting the pulley as the tool is passed proximally toward the palm of the hand. Twenty-four fresh cadaver A1 pulleys were divided percutaneously and then converted to an open technique for an analysis of pulley division, tendons, and the neurovascular bundles for potential damage. Semi-quantitative assessment was made of tendon damage, completion of pulley division, and for the size of the incision.

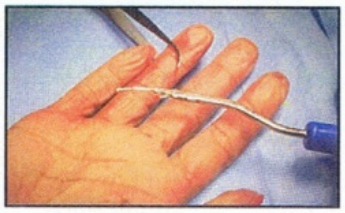

Figure 2: Protoptype of the triggertome instrument

Results

The average size of the incision for the 24 procedures was 5.3 mm. A subsequent dissection revealed that two of 24 tendons had minor longitudinal lacerations and that 19 of the 24 A1 pulleys had complete division. The 5 cases in which the pulley was not divided resulted from the device having not been properly placed before deploying the blade. There was no opportunity to evaluate the release since none of the specimens were affected with trigger finger. With the clinical feedback of symptomatic release, the lack of engagement of the device would have been known and the success would likely have been 100% transaction. No damage to the tendon was noted in cases in which the pulley was not completely divided and a second pass attempt would be warranted clinically. No damage to neurovascular structures were noted.

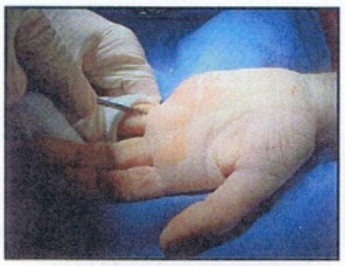

Figure 3: Slide the instrument proximally through a small gap between A2 and A1 pulleys

Conclusion

Minimally invasive trigger finger release provides an office-based procedure to effectively treat this condition. Limited visualization with percutaneous techniques provides concern for greater chance of injury to the neurovascular bundle or inadequate release. However, open trigger finger release has reported dissatisfaction rates as high as 15-26% and has been associated with complications such as wound problems and loss of motion. Literature has shown that percutaneous release can be a safe and effective alternative. Transverse incisions at the palmar digital crease in this technique were very small and more cosmetic than classic longitudinal incisions more proximally placed in the palm. This study demonstrated the efficacy of a new tool for A1 pulley release on cadaver specimens. Device features integrate key protective elements that providing a margin of safety in its use. The office-based procedure may provide economic incentives to patient care based on the utility of the intervention.

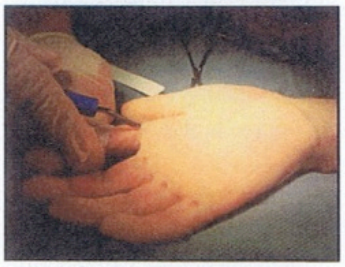

Figure 4: Continue to slide instrument proximally until it gives way releasing the proximal extent of A1 pulley

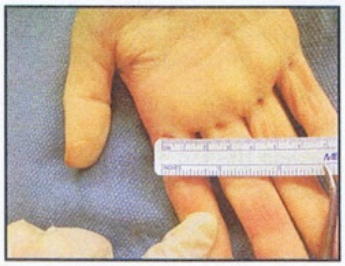

Figure 5: Average size of incision- 5.3 mm

References

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