Percutaneous trigger finger release with 18-gauge needle

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ABSTRACT

Objective: To further assess the safety, efficacy, and results of the percutaneous trigger finger release, using the tip of an 18-gauge needle.

Methods: At King Hussein Medical Center, Amman, Jordan, from January 2004 to January 2006, 42 patients with trigger fingers were treated with percutaneous A1 pulley release. The operations were performed using the tip of an 18-gauge hypodermic needle, to release the A1 pulley, by an experienced orthopedic hand surgeon. There were 24 women and 18 men. The mean age of the patients was 56 years (range 32-75 years). The mean duration of follow-up was 18 weeks. The results were classified as satisfactory if the treated finger was no longer clicked or locked and was comfortable, and as unsatisfactory if there was persistent discomfort or if open surgery were required.

Results: Satisfactory results were achieved in 39 cases (92.8%) in which fingers were completely free from triggering. There were 3 cases (7.2%) in which treatment failed to relieve the symptoms, residual triggering was still found, and all 3 cases were diabetic. These 3 cases required open release.

Conclusion: Percutaneous A1 pulley release is an effective, safe, and convenient procedure for the treatment of trigger finger. It is well tolerated by patients and should be the treatment of choice for the established trigger finger. It must be carried out by an experienced orthopedic hand surgeon to ovoid serious complications.

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Stenosing tenovaginitis (trigger finger) of the A1 pulley is an acquired structural disorder frequently encountered by surgeons. The triggering is caused by enlargement of the tendon, swelling, and thickening of the normally thin synovial covering of the tendon, or as a result of thickening of the fibrous sheath through which the tendon glides.[1] When conservative treatment with corticosteroid injection fails, surgical release of the A1 pulley is required.[2-4] In 1958, Lorthioir[5] described the technique of percutaneous release of the A1 pulley for trigger digits. Minimally invasive or percutaneous A1 pulley release is being increasingly used as an alternative to open surgical release and injection of local steroids for the treatment of the trigger digit. Percutaneous trigger finger release has been reported as a safe, effective procedure, with clinical efficacy of 91-95%.[6–11] It is a quick procedure with significantly good results in short-term postoperative rehabilitation.[12] The aim of this study was to assess the safety, efficacy, and results of the percutaneous trigger finger release, using the tip of an 18-gauge needle.

Methods. From January 2004 to January 2006, percutaneous release of the Al pulley on 42 patients with triggering was performed, at King Hussein Medical Center, Amman, Jordan. There were 24 women and 18 men. The mean age of the patients was 56 years (32-75). The mean duration of follow-up was 18 weeks. The thumb was involved in 11 cases, the index finger in 7 cases, the middle finger in 14 cases, the ring finger in 9 cases and the little finger in one case. The mean duration of symptoms before treatment was 2.4 months (3 weeks to 8 months). Three patients had rheumatoid arthritis, and 9 patients had diabetes mellitus. Eight patients had had a carpal tunnel release in the same hand previously. A total of 16 digits (38%) had failed a trial of treatment by steroid injection at least once before percutaneous release. Twenty patients were graded as grade IV and 22 patients were graded as grade V according to the Quinnell grading system[13] (**Table 1**). An 18-gauge needle was used for percutaneous A1 pulley release because it is rigid, sharp, and easy to handle.

Operative technique. The operations were performed using the tip of an 18-gauge hypodermic

Table 1 - Severity of triggering according to the Quinnell grading system.

Grade	Clinical findings	No. of patients
I	Normal movement, no pain	
II	Normal movement, occasional pain	
III	Uneven movement	
IV	Intermittent locking, actively correctable	20
V	Locking, only passively correctable	22

needle to release the A1 pulley, and carried out by an experienced orthopaedic hand surgeon. The procedure can be carried out in the operating room under local anesthesia, as a day case. The point of triggering at the Al pulley is located by palpation. The surface landmarks of the proximal edge of the pulley are marked on the skin. These are located at the proximal palmar crease for the index finger, halfway between the proximal and distal palmar creases for the middle finger, the distal palmar crease for the ring and little fingers, and the metacarpophalangeal crease for the thumb. The procedure usually takes less than 5 minutes. For percutaneous release of a trigger thumb, the location of the pulley needs to be carefully outlined by positioning the thumb in abduction, slightly flexing the wrist, and supinating the forearm. The 18-gauge needle is inserted one cm distal to the metacarpophalangeal crease, in the center of the thumb. The proximal edge of the pulley is identified with the tip of the needle at the level of the metacarpophalangeal crease. Care must be taken not to extend the tip too proximally because of the proximity of the radial digital nerve.

Results. Thirty-nine (92.8%) fingers were completely free from triggering. Residual triggering or inadequate release was found in 3 (7.2%) fingers at final follow-up, and all the 3 patients were diabetic. These 3 cases required open release due to recurrence of triggering. The 39 successful cases were therefore classified as satisfactory, and the 3 failed cases were classified as unsatisfactory. All cases showed no complications such as infections or neurological deficits. There was no loss of range of motion or loss of sensation. There was no clinical evidence of digital nerve or flexor tendon injury.

Discussion. The majority of patients with mild or moderate triggering (Quinnell grade I or II) can be treated successfully with extension splintage, anti-inflammatory medication, or steroid injection into the flexor sheath. Newport et al,[14] reported a series of 338 trigger digits in which they achieved a 77% cure rate with steroid injection alone. Patients with grade III or IV triggering and those who have failed conservative, or injection treatment require surgical release of the A1 pulley. Open release of the A1 pulley is universally accepted and gives excellent functional results. Open surgical release must be reserved for certain cases such as florid tenosynovitis, failed percutaneous release, or cases with prior surgery or trauma. However, the procedure needs to be carried out as a day-case surgical procedure and the operative site can be painful for up to 2 weeks post-surgery.[15] Techniques for percutaneous release of the Al pulley have been described with satisfactory results and few complications.[8-11,16-18] If equally effective, a percutaneous release will avoid the time and expense of an open procedure. Several reports have described results using a needle for percutaneous release. Stothard and Kumar[10] eliminated triggering in 95% of 38 fingers. Eastwood et al[11] successfully released 32 of 35 digits (91%). Several authors have indicated that the proximity of the digital nerves in the thumb poses a considerable risk of injury when the percutaneous technique is used. The radial digital nerve passes diagonally across the tendon of flexor pollices longus from the ulnar to the radial side, a few millimeters proximal to the metacarpophalangeal flexion crease. Distally, the nerve is located on the far lateral side of the thumb.[16] In our technique, the needle is introduced distal to the pulley between the 2 digital nerves one cm distal to the metacarpophalangeal crease, thus, minimizing the risk of injury. Injury to the flexor tendon has been described as a complication of the percutaneous technique, but because all the cases in this study were carried out by experienced orthopedic hand surgeons; no flexor tendon injuries were encountered. Satisfactory results with complete relief of triggering were achieved in 93% of cases using this technique. It can be easily, quickly, and safely carried out in the outpatient clinic, and is well tolerated by patients. A patient with acute triggering is probably best managed by an injection of steroid. But when this fails, we believe that percutaneous release is the treatment of choice. We also recommend it in patients who have had symptoms for more than 4 months or who have grade-3 or grade-4 triggering. Although we did not perform an actual cost analysis study, the percutaneous technique is less expensive than the open technique. While open surgery requires the use of sterilized equipment and a suture, the percutaneous technique requires only one disposable needle.

In conclusion, as 93% of all patients responded well to percutaneous trigger finger release, with no complications, it should be considered as the primary treatment method for established trigger finger.

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