

# PERCUTANEOUS TRIGGER FINGER RELEASE WITH MICROVITREORETINAL 19 GAUGE OPHTHALMOLOGIC KNIFE

VEDAT URUC<sup>1</sup>, ABDULLAH KURSAT CINGU<sup>2</sup>, EMRAH SAYIT<sup>3</sup>, FATİH KUCUKDURMAZ<sup>4</sup>, MAHMUT NEDİM AYTEKİN<sup>5</sup>

## ABSTRACT

**Objective:** Conservative treatment of trigger finger includes often local injection of steroid. This has a high rate of failure and repeated injections may be required. **Methods:** When conservative treatment fails, open release of the A1 pulley is recommended. Various methods using various instruments have been reported. We used 19 gauge microvitreoretinal (MVR) ophthalmic knife in percutaneous release of trigger finger. **Results:** We released 50 trigger fingers percutaneously

with this knife. Satisfactory results were achieved in 45 of them (90%). **Conclusion:** Object of this study is to produce a new technique for percutaneous release of trigger finger using 19 gauge microvitreoretinal (MVR) ophthalmic knife. **Conclusion:** Satisfactory results were achieved in 45 of them (90%). **Level of Evidence:** Level IV cases series.

**Keywords:** Trigger finger disorder. Orthopedic procedures. Treatment outcome.

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## INTRODUCTION

Trigger finger is a relatively common problem. The first choice is conservative treatment, and if it fails, release of the A1 pulley becomes the treatment option for trigger finger. Conservative treatment involves a high failure rate, requiring repetitive injections.<sup>1,2</sup> When conservative treatment fails, open release of the A1<sup>2-4</sup> pulley is recommended. Lorthioir<sup>5</sup> described a percutaneous release technique using a thin tenotome for the first time. Various methods using several instruments were reported afterwards.<sup>3,6-10</sup>

We used a knife designed for ophthalmologic surgery for the percutaneous release of trigger finger. We released 50 trigger fingers percutaneously with this blade. Satisfactory results were obtained in 45 of them (90%). We recommend this safe and effective outpatient procedure for compatible patients. The aim of this study is to develop a new percutaneous trigger finger release technique using microvitreoretinal (MVR) 19 gauge ophthalmic knife.

## MATERIAL AND METHODS

19 gauge MVR ophthalmic knives have a rhomboid edge with two cutting sides. We performed the percutaneous release of the A1 pulley in 50 trigger fingers of 50 patients with the MVR

ophthalmic knife. The sample was formed by 40 women and 10 men with mean age of  $51.7 \pm 5.7$  years (min.: 40; max.: 62). The thumb was involved in 32 cases, the forefinger in 10 and the middle finger, in eight patients. The mean duration of the symptoms prior to treatment was  $8.6 \pm 4.7$  months (min.: 3; max.: 32). Three patients had rheumatoid arthritis and five had diabetes mellitus. Previously, four patients were submitted to carpal tunnel release in the same hand. Fifteen patients had at least one failure of the treatment with steroid injection before percutaneous release.

The fingers of the hand were classified according to the severity of symptoms. In degree 1, there was no trigger deformity, but instead, irregular movement of the finger. In degree 2, the trigger deformity was actively corrected; in degree 3, in general it was corrected by the other hand and in degree 4, the finger became locked. We classified 20 fingers (40%) as degree 2, 15 (30%) as degree 3 and 15 (30%) as degree 4. Of the latter, 10 became locked in extension and five in flexion. The patients that did not respond to the conservative methods were selected for treatment by this method, which was also used in the primary conduct of patients that had symptoms for more than 4 months, whose trigger deformity was degree 3 or 4.

All the authors declare that there is no potential conflict of interest referring to this article.

1. Department of Orthopedics and Traumatology, Ergani Public Hospital, Diyarbakir, Turkey

2. Department of Ophthalmology, Faculty of Medicine Diyarbakir, Turkey

3. Department of Orthopedics, Diskapi Yildirim Beyazit Research and Educational Hospital, Ankara, Turkey

4. Orthopedic and Traumatology Clinic, Uskudar HospitalTurk, Istanbul, Turkey

5. Department of Orthopedics and Traumatology, Fatih University Hospital, Ankara, Turkey

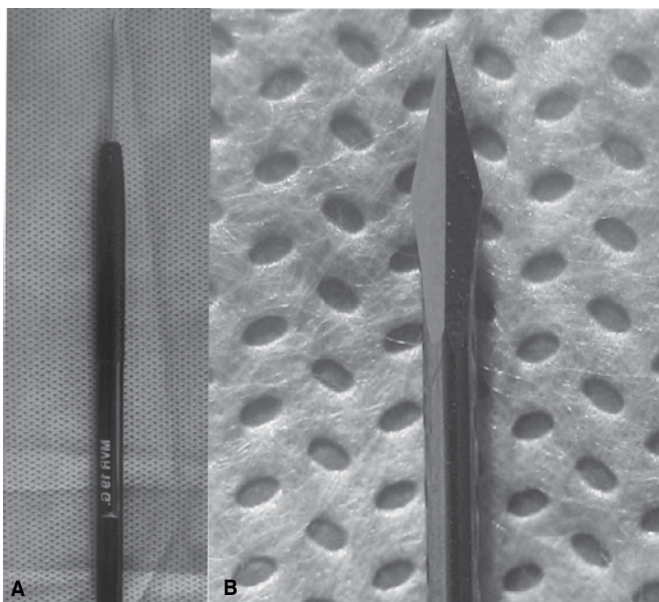
**Mailing Address:** Fatih Kucukdurmaz. Orthopedic and Traumatology Clinic Uskudar HospitalTurk, Selmanipak cd. No:72. Uskudar, Istanbul, Turkey  
Email: [kucukdurmaz@yahoo.com](mailto:kucukdurmaz@yahoo.com)

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## SURGICAL TECHNIQUE

The instrument used looks like a needle, but its tip resembles that of a sword. It has a pointed extremity and two cutting sides (Figure 1 a, b). The procedure can be performed in an outpatient setting under local anesthesia. The surface anatomy references of the proximal and distal edges of the A1 pulley are marked on the skin.<sup>11</sup> The distance between the proximal interphalangeal crease (PIC) and the palmar digital crease (PDC) was used to predict the proximal edge of the A1 pulley (Figure 2a). After measuring the distance from PIC to PDC, an equal distance was marked proximal to PDC.<sup>12,13</sup> The percutaneous positioning of 25 gauge 5mm proximal to PDC marked the distal extension of the release (Figure 2b).<sup>12</sup> The metacarpophalangeal crease of the thumb is the anatomical reference of the proximal edge of the A1 pulley. In the fingers, with the exception of the thumb, the knife is introduced a few millimeters distal to the proximal edge of the pulley and is advanced up to the 25 gauge knife, which determines the distal edge of the A1 pulley. The pulley is sectioned from distal to proximal. The sudden relief of resistance on the knife tip ensures adequate release. The free movements of the fingers and the disappearance of trigger deformity should be observed.<sup>9</sup>

For percutaneous release of trigger thumb, the pulley location needs to be carefully delineated by the positioning of the thumb in abduction, slightly flexing the wrist and performing supination of the forearm.<sup>2,14,15</sup> The knife is inserted 1cm distal to the metacarpophalangeal crease, in the center of the thumb under local anesthesia. The proximal edge of the pulley is identified at the level of the metacarpophalangeal crease. It is necessary to be careful not to overly extend the tip proximally, due to the proximity of the radial digital nerve.<sup>16,17</sup> A soft bandage was applied after the end of the procedure. The procedure lasted for less than five minutes.



**Figure 1.** A Microvitreoretinal 19 gauge ophthalmic knife, side view. B. Microvitreoretinal 19 gauge ophthalmic knife.



**Figure 2a.** Employed a ratio of the distances of the surface anatomy references of the proximal interphalangeal crease (PIC) up to the palmar digital crease (PDC) to predict the proximal edge of the A1 pulley.



**Figure 2b.** The percutaneous positioning of 25 gauge 5mm proximal to the PDC marked the distal extension of the release.

The clinical exam was repeated on the 3<sup>rd</sup> and 10<sup>th</sup> postoperative days and the patients were reexamined or verified by phone during mean follow-up of 6.4 months (2 to 14). The results were classified as satisfactory if the treated finger did not suffer further locking and remained well, and as unsatisfactory if the discomfort was persistent or required open surgery.

## RESULTS

Of the 50 fingers treated, there was complete resolution of symptoms in 45 (90%). Three fingers had degree 1-2 residual deformity in the second follow-up (6%). We performed open release in these patients and verified that the release was incomplete. The open releases were successful in these cases. Two patients with locked trigger thumb had persistent symptoms, in spite of the reduction of the trigger deformity.

We did not verify any significant complications, such as lesions of the digital nerve, of the tendons, infection of the tendon sheath, or arching of the flexor tendons.

## DISCUSSION

Minimally invasive techniques are being used more and more often in upper limb surgery.<sup>6</sup> Percutaneous release was performed for the first time in 1958, with additional tenotomy.<sup>5</sup> Several techniques used in percutaneous release were described.<sup>6</sup> Almost all of them produce good functional clinical outcomes. In this study, we observed that percutaneous release with MVR 19 gauge ophthalmic knife is a safe, inexpensive, fast, less distressing and more comfortable treatment. We also performed percutaneous release with a hypodermic needle similar to that described by Eastwood *et al.*<sup>17</sup> However, we verified that the knife bends easily and that the tip does not immediately divide the thickened pulleys. The cutting edges of the knife can be used proximally and distally without any need to rotate or withdraw the knife. Since the cutting edges are not very long, injury to the flexor tendon or to the digital nerve is minimized. There is also an elevation on the knife handle that helps the surgeon position the cutting edge of the blade perpendicular to the A1 pulley. The unsatisfactory results were those submitted to surgery

at the beginning of our learning curve. Injuries to the flexor tendons and to the digital nerves were described as complications of the percutaneous technique.<sup>3</sup> To avoid these complications, it is necessary to mark the surface anatomy references before the procedure (Figure 2a and 2b). Hyperextension of the finger also avoids injury to the digital nerve. We did not find any flexor tendon or digital nerve lesion in 45 fingers, including 22 thumbs. The satisfactory results with elimination of trigger deformity were achieved in 90% of the fingers using this technique. It can be performed with ease, speed and safety in outpatient clinics and is well tolerated. It is probably better to treat patients with acute trigger finger using steroid injection first, but if this fails, we believe that percutaneous release is the treatment of choice.<sup>6</sup> It is low-cost, efficient and can be learned in a short time.<sup>9</sup>

## CONCLUSION

We conclude that our new trigger finger percutaneous release technique is effective, can be performed with ease, speed and safety in outpatient clinics, and can be learned in a short time.

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