Percutaneous Release of Trigger Fingers

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Abstract: **Objective:** To determine the effectiveness of percutaneous release of trigger finger Methods: Design: Uncontrolled trial Setting: Department of Physical Medicine and Rehabilitation (PMR), Regional Institute of Medical Sciences (RIMS), Imphal, Manipur, India. **Study population:** All patients with trigger fingers attending PMR OPD, RIMS from November 2012 to October 2013 and who fulfilled the inclusion criteria. **Interventions:** Percutaneous release of A1 pulley by using 24 gauge needle after injection of triamcinolone 40mg mixed with 1 ml of 2% xylocaine. **Outcome was assessed by using Oveinell’s criteria. Results:** Percutaneous release was done in 41 digits. At three months follow up, complete recovery was seen in 39(95.1%) digits, except for two thumbs (4.9%) which showed poor results. There were no major complications. **Conclusions:** Percutaneous release of trigger finger is simple, easy and effective procedure with a low rate of complications.

Introduction:
Stenosing tenosynovitis or trigger finger is generally characterized by pain, swelling, limitation of finger motion and a triggering sensation. It generally involves thumb or index finger, but it can be seen in any other fingers.¹ There is mismatch between the size of the tendon sheath and the tendon which passes through it.² The primary pathology is thickening of the A1 pulley with resultant entrapment of the flexor tendon, thus forming a trigger mechanism.³

The most common symptom is a painful clicking or snapping when bending or straightening the finger. This catching sensation tends to get worse after resting the finger and loosens up with movement. The catching and locking is often painful and interferes with hand function. When severe, the finger may be locked in flexion requiring the patient to use the other hand to release it.⁴

There are various conservative and surgical methods for the treatment of trigger finger. Steroid and local anesthetic injections and splint applications are recommended in acute stages.³,⁴ Surgical release of A1 pulley is indicated when conservative treatment fails. While open release allow full visualization of A1 pulley, several authors have purposed percutaneous release as a viable alternative, noting successful rates of upto 100%.⁵

Nowadays, percutaneous A1 pulley release is the method of choice in patients unresponsive to conservative treatments with the advantages of ease of application, low complication rate and high patient satisfaction. In this study, we aimed to evaluate the effectiveness of percutaneous release of A1 pulley after steroid and local anaesthetic injection.

Materials and Methods:
This study was conducted in the Department of Physical Medicine and Rehabilitation, Regional Institute of Medical Sciences, Imphal, Manipur from November 2012 to October 2013. Patients who were diagnosed with trigger finger and had already been treated with NSAIDs and physical therapy like ultrasound therapy but failed to produce functional recovery were eligible for the study. Informed verbal consent was taken from each of the study participants. Patients with diabetes mellitus, hypertension, grade IV trigger, local infections and those who refused to give consent were excluded from the study.

Procedure:
The finger to be treated was cleaned with betadine solution and surgical spirit. Then the nodule was palpated and finger was held firmly and hyperextended at metacarpophalangeal joint. Then a 2ml or 5ml disposable syringe filled with 20 mg of triamcinolone mixed with 0.5 to 1 ml of lignoacine was inserted into the nodule with the bevel of the needle oriented along the line of the finger. Position of the needle was confirmed by actively flexing the finger and observing the movement of the needle. The needle was withdrawn slowly until it ceases to move with flexion of the finger. Then the steroid was injected at that site after negative aspiration. After about 3-5 min, the A1 pulley was cut by moving the bevel of the needle longitudinally from proximal to distal until loss of grating sensation was felt. Adequate release was shown by disappearance of triggering on active movement of the
finger. A band-aid was applied to the injection site and patient was allowed to return to normal activities. NSAIDS was given SOS. The patient was followed up every month for a period of three months.

Outcome grading was done according to Qveinell's criteria.7

<table>
<thead>
<tr>
<th>Grade</th>
<th>Symptoms</th>
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<tbody>
<tr>
<td>I</td>
<td>Normal movement, no pain</td>
</tr>
<tr>
<td>II</td>
<td>Normal movement, occasional pain</td>
</tr>
<tr>
<td>III</td>
<td>Uneven movement</td>
</tr>
<tr>
<td>IV</td>
<td>Intermediate locking, actively correctable</td>
</tr>
<tr>
<td>V</td>
<td>Locking, only passively correctable</td>
</tr>
</tbody>
</table>

The patients were assessed every month for pain, movement and any infection at the injection site for three months. At third month, those patients with Grade I were graded as having excellent outcome, those with Grade II as having good outcome and those with Grade III-V as having poor outcome.

Results:
Forty-one patients were included in the study and percutaneous release of trigger fingers were done as outpatient cases in the Department of Physical Medicine and Rehabilitation, Regional Institute of Medical Sciences, Imphal, Manipur. The mean age of the study population was 35 ± 4.3 years. Minimum age was 26 years and maximum was 52 years.

Table 1 shows the baseline characteristics of the study population. Females constitute 34(82.9%) of the study population. 29(70.7%) were housewives and 9(21.9%) were labourers.

Table 2 shows that thumb was the most commonly affected digit representing about 51.2%, followed by middle finger representing about 29.3%. Little finger was the least affected digit representing about 2.4% only.

Table 3 shows that at the last follow up visit (i.e. at third month), 31(75.6%) of the cases had excellent result and 8(19.5%) had good result. Only 2(4.9%) had poor result. The poor result group was seen in the thumb only whereas all the other digits showed 100% good results. Major complications like infection, digital nerve injury were not reported.

Discussion:
The aetiology of stenosing tenosynovitis is unclear, but a repetitive trauma does appear to play a role. In a study by Joy AK et al thumb was found to be the most commonly affected finger followed by middle finger.8 But in a study by Sanjib W et al and Pandey BK et al reported that thumb was commonly involved digit followed by ring finger.8 This present study showed thumb as the commonest digit followed by middle finger.

Conservative modalities have been successful in 57% to 97% of cases.7 In the literature, the success rate of the single dose administration of a steroid was reported to be 50%, which further decreases in the presence of diabetes. Open release has a success rate of 99%.8 Despite its success, when compared to percutaneous release, it has disadvantages such as surgical site pain for up to 2 weeks
and potential complications such as infection, digital artery or nerve injury, bow-stringing, scar contractures etc. Single-dose steroid injection with combined with percutaneous release has a reported success rate of up to 91%. Percutaneous release of trigger fingers was first described by Lorthioir in 1958 using a fine tenotome with good results in all 52 patients with no neurovascular complications. Tanala et al reported 64.3% excellent, 9.5% good, 8.1% fair and 18.1% poor results following subcutaneous release of 210 trigger digits with a fine scalpel. Lyu in 1992 performed a closed tenotomy with a curved knife blade in 16 trigger thumb and had high success rate without damaging digital nerve. Ha et al in 2001 used a special blade with a hook end and reported 92% satisfactory result. In 2004 park et al used similar blade with a hook for percutaneous release of locked trigger digit and reported 91% success rate. In 2007 Jongjirashi used 150 full handle knife and reported 92.9% success rate.

Percutaneous release of A1 pulley using 21 gauge needle was first reported by Eastwood et al in 1992 with a success rate of 94%. SanjibW et al reported 73.5% complete relief with percutaneous release using 21 gauge needle. In our study we used 24 gauge needle attached to the 5ml disposable syringe for the percutaneous release. Ha et al pointed out that the needle bent easily and the tip did not readily divide a thickened pulley. The main advantage of using smaller needle was lesser pain while puncturing and if we do slowly chance of bending the needle is less. Several authors have indicated that the close proximity of the digital nerve in the thumb poses a considerable risk of injury to nerves, but this can be avoided by holding the thumb in extension to move the tendon and A1 pulley more anterior to the neurovascular bundle and by avoiding radial approach. In a study of percutaneous trigger finger release by Pandey et al reported 97% improvement and only 3% (2 cases) failed to improved, one in middle finger and other in ring finger. In our study also, we observed 95.1% improvement and 4.9% (2 cases) failed to improve, both in thumb. In these two cases the release was incomplete because of low pain threshold.

**Conclusion:**
In conclusion, percutaneous release is a simple, safe, effective and cheap method of treatment in the management of trigger fingers. The procedure can be done as an outpatient procedure. In view of relatively poor results of conservative treatment, this type of release could even be done as the first line of treatment in patients with trigger finger.

**References:**


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