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Percutaneous trigger finger release using 18G hypodermic needle

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Abstract

Introductions: Patients of stenosing tenosynovitis or trigger finger presents with pain, swelling, limitation of finger movement, and triggering. Thickening of the A1 pulley, with resultant entrapment of flexor tendons, is the primary pathology. In failed conservative treatment, surgical release by open or percutaneous technique is used. The aim of this study was to evaluate the results of percutaneous release of trigger fingers using hypodermic 18-gauge needle under local anesthesia.

Methods: A cross sectional study of percutaneous release of trigger fingers using hypodermic 18-gauge needle under local anesthesia was performed in outpatient clinic at Janaki Medical College Teaching Hospital, Janakpur, Nepal, from July 2016 to September 2017. Informed consent was obtained. All the patients were followed up on 3rd day, 1st week and one month in outpatient department, and further telephone follow up at three and six months after surgery.

Results: There were 38 patients, female 25 and male 13, age 24 to 67 years. Successful release was achieved in 36/38 (95%) with normal activities within 48 hours. None had complications like digital neurovascular injury or tendon bowstringing. One patient had superficial skin infection and was treated successfully with oral antibiotics. Two (5.2%) had pain and recurrent triggering requiring open release in the first week. At one, three and six months follow up patients reported no triggering of released fingers.

Conclusions: Percutaneous release with hypodermic 18-gauge needle under local anesthesia was an effective and convenient method with a low complication rate.

Keywords: percutaneous release, trigger finger, 18-gauge hypodermic needle

Introductions

Trigger finger is caused by stenosing tenosynovitis, characterized by pain, stiffness and sensation of locking or catching when finger is bent or straighten which usually involves thumb and ring fingers.¹ Thickening of A1 pulley due to fibrocartilaginous metaplasia is the primary pathology, causing entrapment of flexor tendons.^{2,3} Treatments include Nonsteroidal anti-inflammatory drugs (NSAIDs), splinting, corticosteroid injection, open and percutaneous release.^{3,4} The reported success of conservative treatment is 50-92%.^{3,4} Percutaneous release was first performed in 1958 using a fine tenotome.⁵ In 1992 percutaneous release using hypodermic needle claimed 100% success.⁶ This is becoming treatment of choice in patients unresponsive to conservative treatment.³⁻⁷

In open surgery, A1 pulley is cut via a longitudinal or transverse incision.⁸⁻¹⁰ Percutaneous release using hypodermic needle is convenient, cost-effective with a low complications of infection, painful scar, tendon bowstringing, joint stiffness, and digital neurovascular damage.^{3-6,11-13} However, arguments over the superiority of open versus the percutaneous release continues.⁶⁻¹⁴

The aim of this study was to evaluate the results of percutaneous trigger finger release using 18G hypodermic needle.

Methods

This was a cross sectional study performed at Janaki Medical College Teaching Hospital, Janakpur, Nepal, from July 2016 to September 2017 on trigger fingers of patients who were unresponsive to conservative treatment. A clinical diagnosis of trigger finger was defined

as a history of triggering or locking of finger with or without pain and tenderness or swelling at A1 pulley. Exclusion criteria were age <18 years, eczema at the site of A1 pulley, history of previous tendon laceration or injury, and prior corticosteroid injection in the last three months. Informed consent was taken. The procedures were performed in outpatient department (OPD) procedure room.

Data included patients demography (gender, age), involved finger and side, associated medical illness (hypo/hyperthyroidism, diabetes mellitus and hypertension), and time to return to normal daily activities. Complications such as signs of infection, recurrence of symptoms, digital neurovascular injury and tendon bowstringing were recorded.

Surgical technique used to release A1 pulley percutaneously was as described by Eastwood et al.⁶ The procedure was performed under local anesthesia and release of trigger using 18G hypodermic needle. The involved finger was hyperextended to facilitate the palpation of A1 pulley. After puncturing the skin, the needle was advanced until it was located in the tendon, confirmed by paradoxical movement of the needle with flexion and extension of the finger. The needle was then withdrawn slightly until there was finger movement, but no needle movement. Release of A1 pulley was performed by moving the sharp edge of the needle up and down along the longitudinal axis of the finger with a grating sensation felt as the needle tip cut through the transverse fibers of the A1 pulley. A sudden loss of the grating sensation ensured adequate release. The patient was asked to flex and extend the finger to verify the success of procedure. Free active finger movements and loss of triggering confirmed the adequate release of A1 pulley. A small dressing was used for 24 hours. All the patients were encouraged to move the operated finger immediately after operation and return to their normal daily activities. Oral analgesic ibuprofen 400 mg three times a day a need was given for three days.

Patients were followed up in OPD on 3rd day, 1st week and one month. Phone call communication was used for follow up at 3 and 6 months. In first two follow-ups in OPD, we checked for signs of infection, digital nerve injury, time of returning to normal daily activities and recurrence of symptoms. During other follow-ups, we mainly focused on recurrence of triggering.

Results

Out of total 38 patients, 25 (65.8%) were female and 13 (34.2%) male with various trigger fingers. The mean age was 41.9 years (range 24 to 67). Twenty-nine (76.3%) right sides and nine (23.7%) left sides were involved. There were 21 (55.3%) thumbs, 12 (31.6%) ring fingers, and five (13.1%) middle fingers affected. Associated medical illness were hypothyroidism in 5 (13.1%), diabetes mellitus in 4 (10.5%) and hypertension in 4 (10.5%) patients.

In the first week, two (5.2%) patients complained of pain and recurrent triggering, for whom open release was performed and we found that the distal part of the A1 pulley was not released completely. These included a thumb and a middle finger. One (2.6%) patient had superficial skin infection thumb which was treated successfully with oral cloxacillin. Other 35 patients were completely relieved without any complain. None of the patients had complications of digital nerve, vascular or tendon injury, or tendon bowstringing. The success rate of percutaneous release was 36/38 (95%) with return to normal daily activities within 48 hours of release. At 3 and 6 months telephone follow up, patients had no complains and reported satisfactory movement without triggering of released fingers.

Discussions

In our study, successful percutaneous release of A1 pulley was achieved in 36/38 (95%) returning to normal daily activities within 48 hours. In 2/38 (5%), there was incomplete release of A1 pulley for whom open release was performed. None of the patients had complications of digital nerve, vascular or tendon injury, or tendon bowstringing, except one thumb with superficial skin infection. Similar study reports no complications but two recurrences in 63 percutaneous releases.¹² In a series of 185 trigger fingers, percutaneous release of A1 pulley was successful without complications.¹³ Study reports percutaneous release had overall success of 51/58 (97%) with no clinical evidence of digital nerve injury or tendon bowstringing after release with 18G needle.¹⁵ Similarly, 97% excellent and good results is reported using 18G needle.¹⁶

We had no complications of nerve, vascular or tendon injuries, or tendon bowstringing. In a comparative study of 32 open and 40 percutaneous release, the results suggested that percutaneous release was a satisfactory alternative to open release.¹⁷ Long-term results of 266 percutaneously released and 70 open released reported similar excellent long-term results in both groups.¹⁸ Percutaneous release in 48 trigger digits and open surgery in 20 revealed that the release of the pulley was successful and only two patients had minor abrasions, without any tendon injury.¹⁹

The close anatomical relationship between the radial digital neurovascular bundle of the thumb and the A1 pulley has been demonstrated in several cadaveric studies. Due to this proximity, some authors advocated that percutaneous release of thumb is potentially hazardous.^{11,20,21} Nevertheless other authors reported excellent and good results in thumb too.¹²⁻¹⁷ In order to prevent digital nerve damage, the needle should be held above the tendon in the midline of the thumb and radial approach should be avoided.

Secondly, the needle should be inserted a few millimeters distal to the metacarpophalangeal flexion crease. Thirdly, the thumb should be held in full extension during the procedure as this will move the tendon and A1 pulley anterior to the neurovascular bundle. And finally, the forearm should be placed in hyper-supination to make the palmar surface of thumb in a horizontal plane for good orientation.²² We did not encounter any nerve injury in our series up to six months follow up.

Some of the limitations of our study were small numbers of cases, lacking comparison with other release technique (open release) and relatively shorter follow up duration

Conclusions

Percutaneous release using an 18G hypodermic needle for the treatment of trigger finger has good success with low complications. It can be easily performed in outpatient department.

Conflict of Interests

None.

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