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Research Article

Functional outcome of patients with trigger finger treated by local steroid injection vs open release-a prospective comparative study

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Abstract

Background: The aim of the present study is to assess the functional outcome in Trigger finger patients treated by local corticosteroid injection versus open A1 pulley release.

Materials and method: This randomised trial was conducted between May 2019 and August 2019 at a tertiary care centre in Navi-Mumbai on 31 consecutive patients who were divided in two groups as per Quinnell type II-IV. Patients with type I or V involvement, and allergic to local anaesthetic were excluded from the study. Group A were treated with local corticosteroid injection while the patients in group B were treated surgically by open release. The final outcome was calculated using DASH scores.

Results: The mean age of the patients was 53.45 ± 7.21 and 55.72 ± 10.13 in group A and B respectively. The middle finger was most commonly involved accounting for 11 (35.48%) cases. Two (14.2%) cases in group A had decreased range of movements. The patients in group B had better DASH scores at the end of 3 and 6 months respectively which was statistically significant (p=0.0207).

Conclusion: Single dose steroid can be used as first line of management; however, its superiority over open surgical release is not completely justified.

Keywords: trigger finger, DASH, corticosteroid, open release

INTRODUCTION

Trigger finger is a common condition that occurs when the gliding movement of the flexor tendon is blocked by the osteofibrous canal of the A1 pulley, which leads to painful triggering, clicking movements of the affected digits at the Proximal Interphalangeal Joint (PIPJ) [1]. The lifetime risk of trigger finger is between 2% and 3%, but may increase to up to 10% in diabetics [2]. This condition is more prevalent in females, affects the dominant side and most commonly the thumb [3].

Numerous treatment modalities have been proposed which includes conservative modalities like orthosis, non-steroidal anti-inflammatory drugs, corticosteroid injections [4-6] in or around the tendon sheath, or operative interventions like a percutaneous or open release of the A1 pulley [7-9]. Inspite of all the aforesaid methods, the ideal treatment for trigger finger still remains controversial.

The aim of the present study was to compare the clinical and functional outcome of local steroid injection versus open release for trigger finger.

MATERIALS AND METHODS

A prospective randomised trial was conducted between May 2019 and August 2019 at a tertiary care centre in Navi-Mumbai on 31 consecutive patients who presented at our outpatient department with trigger finger. The inclusion criteria were single digit involvement with symptomatic trigger finger classified as Quinnell type II-IV. Patients with type I or V involvement, patients with allergy to local anaesthetic were excluded from the study. All the patients were divided into two groups. Patients in group A (n=14) were treated with local corticosteroid injection while the patients in group B (n=17) were treated surgically by open release. All the patients who consented to participate in the study were randomly asked to open a closed opaque envelope, based on which the treatment plan was decided. Fourteen patients were included in group A while seventeen patients were included in group B. Ethical committee approval was obtained prior to the commencement of the study.

TECHNIQUE

Corticosteroid injection: Under all aseptic precautions, the affected finger was prepared. A 1:1 solution of a mixture of 2% Xylocaine (Lidocaine) and Inj Dexamethasone (4 mg/ml) was prepared with a total volume of 1.5 ml was injected in and around the A1 pulley using 25-gauge needle. Patient was asked to do immediate range of movements of the affected finger.

Open surgery: All the patients were operated under Biers block. After preparing the volar aspect of the affected finger, a 1 cm-1.5 cm transverse incision was taken at the distal palmar crease. After exposing the A1 pulley, a complete longitudinal release was done till the level of A2 pulley and adequate decompression was achieved proximally and distally both. Thorough range of movements was then performed to assess the effectiveness of the procedure. The wound was then closed with 3-0 monocryl and small dressing was done. The patient was asked to actively flex and extend the finger after the effect of anaesthesia weaned off.

Post-operatively, the patients were managed with analgesics and two doses of injectable second generation cephalosporin. Active range of motion exercises were begun as per the pain tolerance.

Follow-up and final outcome: Regular follow-up for all the patients were done at 2 weeks, 3 months and 6 months respectively. The final outcome was calculated using the Disability of Arm, Shoulder and Hand (DASH) scoring system.

Statistical analysis: The results were expressed as mean with standard deviation and $p<0.05$ was considered to be statistically significant. Analysis was done using the Epi- info software (Version 3.4.3) and Microsoft Excel 2013 (Microsoft Office v15.0).

RESULTS

The mean age of the patients was 53.45 ± 7.21 and 55.72 ± 10.13 in group A and B respectively. There were 19 (61.29%) females in the present study. Involvement of the middle finger was most common amongst both the groups with 11 (35.48%) cases. There were 2 (14.2%) cases in group A, who had decreased range of movements. Since, they did not have any difficulty in performing activities of daily living, they were managed conservatively. The demographics and general characteristics were as shown in Table 1. The pre and post-operative DASH scores were as shown in Table 2. The DASH scoring system consists of 30 subjective questionnaires and the rating is out of 100 points. There was a constant

Table 1. Demographics and Characteristics

Characteristic	Group A n=41 (%)	Group B n=45 (%)	Test of significance	p value
Age	53.45 ± 7.21	55.72 ± 10.13	Unpaired t test	0.3192
Sex				
Male	18 (43.9)	14 (31.2)	Unpaired t test	0.2845
Female	23 (56.1)	31 (68.8)		
Duration of symptoms	31.23 ± 1.24	30.17 ± 3.45		
Digits involved				
Thumb	3 (7.3)	6 (13.4)	Chi square	0.7301
Index	5 (12.2)	3 (6.6)		
Middle	14 (34.2)	17 (37.8)		
Ring	11 (26.8)	9 (20)		
Little	8 (19.5)	10 (22.2)		
Staging				
II	11 (28.5)	7 (15.5)	Chi square	0.4368
III	21 (50)	27 (60)		
IV	9 (21.5)	11 (24.5)		
Decreased range of motion	4 (9.7)	2 (4.5)	Chi square	1
Recurrence	2 (4.8)	1 (2.3)		

Table 2. DASH scores of Group A and Group B at pre-operative, 6 weeks, 3 months and 6 months

DASH score	Group A (n=41)	Group B (n=45)	p value
Pre-operatively	73.21 ± 2.34	72.19 ± 1.28	0.1339
At 6 weeks	43.37 ± 3.54	42.31 ± 4.51	0.4799
At 3 months	29.87 ± 3.26	27.21 ± 2.31	0.0128
At 6 months	9.74 ± 1.48	7.21 ± 3.62	0.0207

decrease in DASH scores in both the groups. However, the difference was statistically significant (at the end of 3 and 6 months respectively with patients in group B having a better outcome).

DISCUSSION

Various conservative and surgical treatments have been described for the treatment of trigger finger. Acute trigger finger can be treated with analgesics and cryotherapy like ICE packs application or immobilization using some form of orthosis, which can especially be used during night time [10]. However, the efficacy of these orthosis have been questioned and they have proved to be effective only in low grade trigger finger with less than 6 months' duration after immobilizing for a period of 6-10 weeks [10].

Salim N et al., in a study comparing steroid injection versus physiotherapy, concluded that the success rate in patients receiving steroid was 97.4% as compared to 68.6% in patients treated with physiotherapy which was statistically significant. They concluded that steroid injection is superior to physiotherapy for mild trigger finger, however, physiotherapy may have a role in prevention of the recurrence. A home based physiotherapy program was given to all the patients in the present study [11].

Studies have mentioned decrease in the level of collagen type I after administration of steroid around the A1 pulley which further helps decreasing the inflammation [1,12,13]. A systematic review [2] of level I and II studies concluded that steroids are effective in relieving pain in upto 57% of the patients. Few studies have stated that the results of steroid are better in trigger thumb with a success rate of 81% as compared to 56% success rate when it affects other fingers [14]. Numerous complications have been mentioned in the literature with the use of steroids namely, dermal atrophy, changes in skin pigmentation, fat necrosis, increase in serum glucose level, infection and rarely tendon rupture [1,12,15]. There were no cases of aforementioned complaints in the present study.

Few studies in the past have mentioned the benefits of repeating the steroids for more than one time. Also, considering two steroid injections, before opting for surgical release can be one of the most cost-effective approach [12,16]. More complications and recurrence rates have been observed in patients where insoluble steroids like Triamcinolone acetonide or methylprednisolone has been used as opposed to soluble steroids like dexamethasone or betamethasone [12,17-19]. A retrospective review on 878 patients comparing effect of two different steroids showed that the apparent resolution after injecting triamcinolone was more (83%) when compared with patients who were administered dexamethasone (30%). However, the rate of recurrence with dexamethasone was nearly 4 times less than triamcinolone (13% versus 50%) [12]. The authors also stated that the variations could also be because of the different treatment regimes followed by different surgeons. Two patients in the present study in group A had decreased range of motion at the end of 6 months. Since they were able to perform activities of daily living, no further intervention was required and both of them responded partially to massage therapy.

Studies by Moore [20] and Bunnel [21] have mentioned that the ring finger followed by thumb is most frequently affected by triggering. In the present study, ring finger was involved in 38.7% of the cases.

Surgical management for trigger finger is still considered to be the gold standard. Nonetheless, the ideal timing for the surgery still remains controversial and is based on surgeon preference and patient demands and clinical findings. Few hand surgeons believe that surgery should be the treatment of choice after two or even single dose of steroid administration while few prefer surgery as primary line of treatment.

Percutaneous release for trigger finger was first described by Lorthioir in 1958 using a tenotome [7], following which, numerous ways for the same using hypodermic needle [1,22,23], blade [24] or specially designed knifes [25,26] have been mentioned in the literature. The success rate for percutaneous release has been reported to be 84%-100% at mid-term follow-up [27-29]. However, since this is a blind procedure, various complications have been reported with this technique. The most frequently encountered complication is hypoaesthesia due to the injury to the digital nerve and thus few studies suggest to avoid percutaneous release for thumb and index finger, owing to the proximity of the nerve around A1 pulley [30,31]. Few other complications could be incomplete excision of the A1 pulley, scar tissue formation, and painful tenosynovitis, tendon weakening or even lacerations [31].

On the contrary, the success rate of open surgery has been reported to be 94%-100% which could be due to complete dissection of the A1 pulley [1,7,9,24,32]. However, in a large series of nearly 1600 patients, the overall complication rate was 5.3% with major complications accounting for 0.9% [33]. Another study concluded that male gender, sedation and general anaesthesia are potential risk factors for complication after an open release in trigger finger [34]. The only minor complication encountered in the present study was persistent pain at the incision site in 2 cases, which resolved gradually at the end of 3 weeks. No case required revision surgery in the present study. None of the meta-analysis or appraisals has come up with specific guidelines. Nonetheless, it is advised that the steroids should be considered as primary line of treatment in patients who do not wish to undergo surgery and the most two injections should be attempted before considering open surgery [35,36].

The DASH scoring is a good way to measure the subjective outcome in a patient with upper limb disorders. In the present study, the DASH scores showed a statistically significant difference between both the groups suggesting the superiority of open surgery over steroid injection.

This study is not without limitations. Small number of sample size and less duration of follow-up are its limitations.

CONCLUSION

Single dose steroid is justified in every aspect as an alternative to open release in terms of ease of doing, cost effectiveness, lesser invasive early resumption of work and can be used as first line of management; however, its superiority over open surgical release is not completely justified.

CONFLICT OF INTEREST

No Conflict of Interest.

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