

A COMPARISON OF 4 DIFFERENT PATIENT GROUPS IN THE TREATMENT OF TRIGGER FINGER: IS TREATMENT ACCORDING TO GRADE IMPORTANT?

TETİK PARMAK TEDAVİSİNDE 4 FARKLI HASTA GRUBUNUN KARŞILAŞTIRILMASI: EVREYE GÖRE TEDAVİ ÖNEMLİ Mİ?

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Öz

Amaç: Stenozan tenosinovit olarak da adlandırılan tetik parmak elde ağrı ve fonksiyon bozukluğuna sebep olan ve en sık görülen el patolojileri arasındadır. Çalışmamızda hastalar, uygulanan tedavi açısından 4 farklı gruba ayrılmış ve bu tedavi seçeneklerinin farklı evreler üzerindeki etkinliği değerlendirilmiştir. Gereç ve Yöntem: 2011-ocak 2015 arasında A1 pulleyi etkileyen 543 tetik parmak tanılı hasta retrospektif olarak değerlendirildi. Hasta verilerine hastane kayıtları ve klinik kayıt dosyalarından ulaşıldı. 301 hasta kadın 242 hasta erkek idi. Hastaların evrelenmesinde Quinnell evreleme sistemi kullanıldı. Bulgular: Hastaların uygulanan tedaviler ve evrelerine göre work modülleri değerlenderildiğinde ;tüm evreler için preoperatif değerlere göre work modulu oral ve lokal NSİİ grubu hariç; lokal kortikosteroid, perkutan release ve açık cerrahi gevşetme tedavilerinde istatiksel olarak anlamlı düzeyde düzelmiş idi ($p<0.005$). Oral NSİİ grubunda ise tedavi sonrası değerler preoperatif değerlere yakın ve anlamlı bir farklılık yok idi. Tartışma: Çalışmamızda elde ettiğimiz veriler ışığında tetik parmak patolojisinde evre artıkça, fonksiyonel performans ve kinematik üzerinde meydana gelen olumsuz etkilerin giderilmesi için daha invazif tedavi seçeneklerinin daha tatminkar sonuçlar sağladığı kanısındayız.

Anahtar Kelimeler

Tetik Parmak; Perkutan Gevşetme; Kortikosteroid

Abstract

Aim: Stenosing tenosynovitis, known as trigger finger, is one of the most commonly seen hand pathologies, causing pain and impaired function in the hand. In this study, the patients were separated into 4 groups according to the treatment applied and an evaluation was made of the efficacy of these treatment options on different grades. Material and Method: A retrospective evaluation was made of 543 patients, 301 females and 242 males, diagnosed with trigger finger affecting the A1 pulley between February 2011 and January 2015. Patient data were obtained from hospital records and the patient clinical records. The Quinnell grading system was used to grade the trigger fingers. Results: When the work modules were evaluated according to the grades and the treatments applied to the patients, with the exception of the oral NSAID group, a statistically significant improvement was determined in the work module for all grades compared to the preoperative values of the local corticosteroid, percutaneous release, and open release treatments ($p<0.05$). In the oral NSAID group, the post-treatment values were similar to the pre-treatment values and there was no significant difference. Discussion: In light of the data obtained in this study, it was seen that as the grade increased in trigger finger, more satisfactory results were provided by more invasive treatment options to remove the negative effects on functional performance and kinematics.

Keywords

Trigger Finger; Percutaneous Release; Corticosteroid

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Introduction

Stenosing tenosynovitis, known as trigger finger, is one of the most commonly seen hand pathologies, causing pain and impaired function in the hand. The pathology, which starts with pain and sensitivity at the level of the tendon related to the palmar region of the hand, gradually progresses to sticking during flexion and extension movements of the finger, popping, and finally may result in locking in a specific position. Incompatibility between the dimensions of the retinacular pulley and the flexor tendon is known to cause this pathology. Although trigger finger is defined as a mild hand pathology, it is becoming more emphasized because of the increasingly negative effect on hand functions and daily activities [1].

The treatment protocol for trigger finger continues to be a controversial topic. In contrast to the very good results reported from open and percutaneous surgery on trigger finger [2-3], there are also studies which have reported undesired outcomes in open surgery, such as infection, scar formation, and delayed return to work [4-5] and incomplete release and iatrogenic nerve damage in percutaneous surgery [6]. In recent years, the negative effect on rehabilitation of adhesions which have formed postoperatively has been better demonstrated, thereby strengthening the view that trigger finger treatment should be planned according to the clinical stage and unnecessary surgery should be avoided [7]. In this study, the patients were separated into 4 groups according to the treatment applied and an evaluation was made of the efficacy of these treatment options on different grades.

Material and Method

A retrospective evaluation was made of 543 patients diagnosed with trigger finger affecting the 1st finger A1 pulley between February 2011 and January 2015. Patient data were obtained from hospital records and the patient clinical records. The patients were 301 females and 242 males. The Quinnell grading system was used to grade the trigger fingers (Figure 1). Accordingly, 122 patients were evaluated as Grade 1, 173 patients were Grade 2, 144 were Grade 3, and 104 were Grade 4. Patients at Grade 1 and any patients with diabetes were excluded from the study. Thus the evaluations were made on a total of 402 patients, 231 females and 171 males. Three groups were formed in accordance with the Quinnell grading system as Grade 2, Grade 3, and Grade 4. All patients were treated with oral non-steroid anti-inflammatory drugs (NSAID) of 50mg diclofenac potassium x 2/day (100mg/day) (Dicloflam, Santa Farma, Istanbul) for a total of 6 weeks for the analgesic and anti-inflammatory effects.

Grade 0	Mild crepitus in the non-triggering finger
Grade 1	No triggering, but uneven finger movements
Grade 2	Triggering is actively correctable
Grade 3	Usually correctable by the other hand
Grade 4	The digit is locked

Figure 1. Quinnell classification of trigger finger

In each grade, the patients were then divided into 4 different subgroups treated with:

only NSAID, local corticosteroid injection to the A1 pulley (Diprospan, Schering Plough, Istanbul: single dose Betamethasone diproprionate 6.43mg+Betamethasone sodium phosphate 2.63mg), percutaneous A1 pulley loosening under local anaesthesia, and mini open A1 pulley loosening under local anaesthesia.

In all the grades, patients who refused surgical treatment or the application of local corticosteroid injection were included in the NSAID protocol. For each patient, a record was made before and after treatment of the DASH values (Disabilities of the Arm, Shoulder and Hand), work module, complication rates, time of return to work, and recurrence rates.

Results

In the Grade 2 group, a statistically significant improvement was determined in the postoperative DASH evaluations of all the treatment options compared to the preoperative values ($p<0.005$). In the comparison of the postoperative DASH values of the sub groups of Grade 2, a statistically significant improvement was determined in the local corticosteroid, percutaneous release, and open release groups compared to the NSAID group ($p<0.05$). The results obtained in the local corticosteroid, percutaneous release, and open release groups were seen to be similar ($p>0.05$) (Figure 2). In the interpretation of the clinical results for Grade 2, it can be said that although an improvement was obtained with the administration of NSAID, this was not as effective as local corticosteroid, percutaneous release, and open release. Patient dissatisfaction was determined at the rate of 76% in the NSAID group. Recurrence was determined in 1.46% of the local corticosteroid patients, in 2.2% of the percutaneous release group, and in 2.6% of the open release group.

In the Grade 3 patients, in the comparison of the clinical results, the pre-treatment and post-treatment DASH values were seen

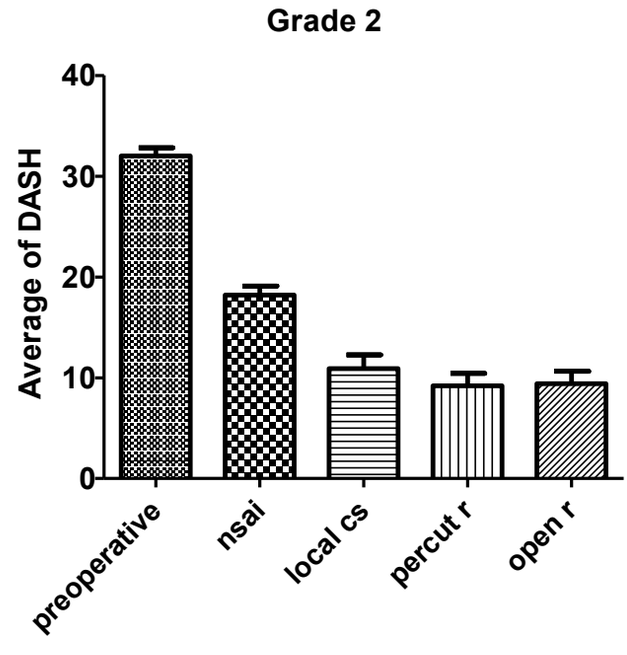


Figure 2. Evaluation of the treatment types of Grade 2 patients

to be similar in the patients who received NSAID only (p>0.05). This suggests that NSAID is not an effective treatment for Grade 3 trigger finger (Figure 3). Clinically similar results were obtained from the local corticosteroid, percutaneous release, and open release techniques and no statistically significant difference was determined in the DASH values (p>0.05). At the final follow-up examination, patient dissatisfaction was determined at the rate of 88% in the NSAID group. Recurrence was determined in 4.4% of the local corticosteroid patients, in 2.2% of the percutaneous release group, and in 2.7% of the open release group.

In the Grade 4 patients, in the comparison of the clinical results of the applied treatments, no significant improvement was determined in the post-treatment DASH values of the patients administered with NSAID only compared to the pre-treatment values (p>0.05). This indicates that instead of using NSAID as a curative treatment for Grades 3 and 4, it would be more correct to consider NSAID as an adjuvant to the main treatments. A statistically significant improvement was determined in the postoperative period of all the patient groups applied with local corticosteroid, percutaneous release, and open release compared to the preoperative DASH values (p<0.05).

In the comparison of the local corticosteroid, percutaneous release, and open release applications for Grade 4, similar clinical results were determined in the local corticosteroid and percutaneous release groups (p>0.05). In the open release group, statistically significant better clinical results were obtained than in the other two treatment options (p<0.05) (Figure 4). These results demonstrate that the application of local corticosteroid and percutaneous release significantly improved the clinical results, but open release can be said to be clinically more effective at a statistically significant level compared to the other two techniques. In this group of Grade 4 trigger finger, patient dissatisfaction was determined at the rate of 100% in the NSAID group. Recurrence was determined to be 7.4% of the local corticosteroid patients, in 2.2% of the percutaneous release group, and in 2.4% of the open release group.

When the work modules were evaluated according to the grades

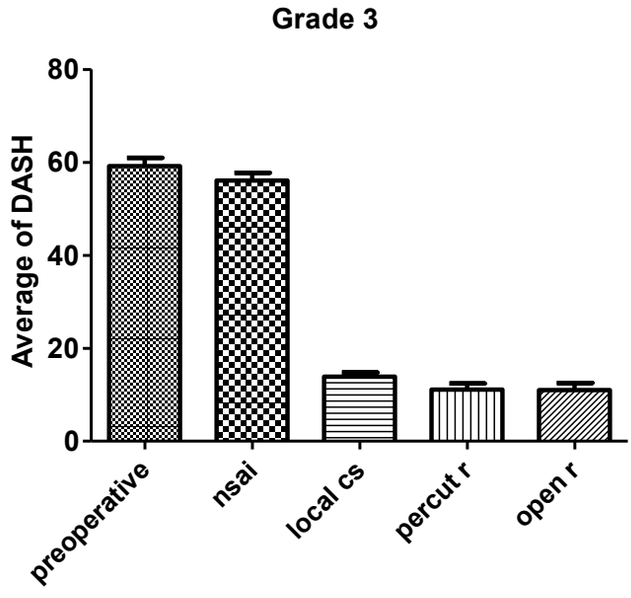


Figure 3. Evaluation of the treatment types of Grade 3 patients

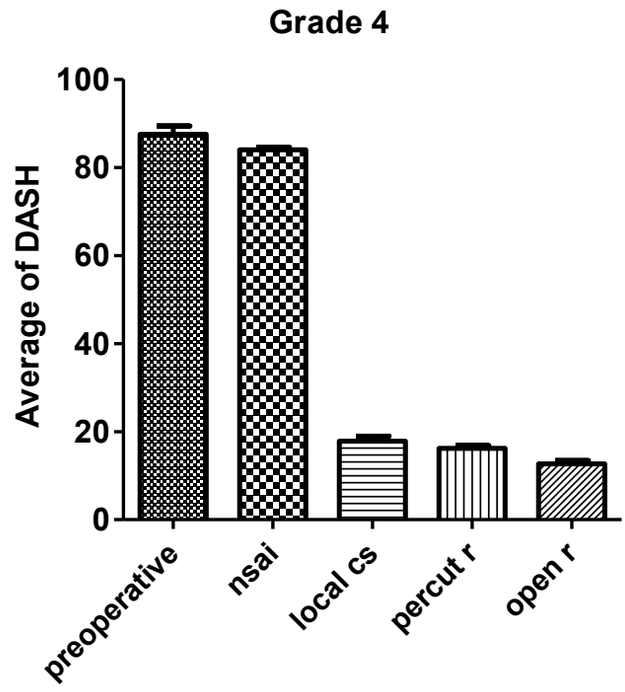


Figure 4. Evaluation of the treatment types of Grade 4 patients

and the treatments applied to the patients, with the exception of the oral NSAID group, a statistically significant improvement was determined in the work module for all grades compared to the preoperative values of the local corticosteroid, percutaneous release, and open release treatments (p<0.05). The values between the groups were similar (p>0.005). In the oral NSAID group, the post-treatment values were similar to the pre-treatment values and there was no significant difference (Table 1).

Statistical Analysis

The statistical analyses of the study were applied using SPSS v.22.0 software. The descriptive statistics of categorical variables were stated as number (n) and percentage (%). In the 2x2 cross-check tables, the Pearson's Chi-square test was used for categorical variables and the Fisher's Exact Chi-square test was used for values that were expected to be <5.

The conformity to normal distribution of the measured variables of both categories was assessed with the Shapiro-Wilk test. In the comparison of data not showing normal distribution, the non-parametric Mann Whitney U-test was used. For data with normal distribution, the t-test was used and the test statistic was selected according to the variance homogeneity examined with the Levene test.

In the comparison of variables with a ratio measurement level of more than two categories, first the normality hypothesis was examined with the Shapiro-Wilk test. If all the categories of the variables had normal distribution at the same time, the non-parametric Kruskal Wallis test was used for those parameters, and if the categories of the variables did not have normal distribution, ANOVA was applied. However, if the result obtained from ANOVA did not have variance homogeneity according to the results of the Levene test, the Kruskal Wallis test was applied in place of ANOVA. Unless otherwise specified, a value of p<0.05 was considered statistically significant.

Table 1. Preoperative and postoperative DASH and Work Modules

	Preop DASH and WM	Postop DASH and Work Module (WM)			
		Oral NSAID	LOCAL CORTICOSTEROİD	PERCUTANEOUS RELEASE	OPEN RELEASE
Grade-2	DASH:31.8 4.8 WM: 25 5.3	DASH:18.2 4.6 WM: 18.8 6.3	DASH:11.4 8.2 WM:6.3 6.3	DASH:9.1 7.2 WM:6.3 6.3	DASH:9.2 6.3 WM:6.3 6.3
Grade-3	DASH:59.1 7.8 WM:50 6.2	DASH:56.8 8.2 WM: 43.8 6.2	DASH:13.6 4.2 WM:6.3 6.3	DASH:11.4 6.2 WM:6.3 6.3	DASH:11.4 8.2 WB:6.3 6.3
Grade-4	DASH:88.6 9.3 WM:81.3 5.4	DASH:84.1 2.3 WM: 75 6.3	DASH:18.2 6.3 WM:12.5 6.3	DASH:15.9 2.3 WB:6.3 6.3	DASH:13.6 3.2 WB:6.3 6.3

Discussion

In the classification of trigger finger, functional performance and kinematics are significantly affected in different grades and this shows correlation with histopathological finding [8, 9]. These data suggest that in cases of trigger finger determined in different grades, the choice of the conservative and surgical treatments applied could affect clinical and functional results and the rates of recurrence. There is evidence that different results are obtained at each grade with different treatment options such as oral NSAID, local corticosteroid injection, percutaneous release, and mini open surgical release. In the literature, while results have been reported of comparative studies related to different invasive treatment protocols in patients at an advanced grade, to the best of our knowledge, there has been no previous study which has compared the treatment results of the whole spectrum from conservative to invasive surgery in patients at the same grade. In this study, by presenting the results of different treatment protocols applied to patients at the same grade, it has been attempted to define a basic algorithm of which treatment would be most appropriate at which grade in the treatment of trigger finger.

In patients diagnosed with Grade 2-4 trigger finger, and treated with local corticosteroid injection, percutaneous release, or open surgical release without any differentiation based on grade, it has been reported that surgical techniques are superior to conservative corticosteroid injection with respect to clinical satisfaction and recurrence rates [10-11].

Many previous studies have compared the application of percutaneous release and open surgical treatment options. It has been reported that percutaneous release carries a greater risk of postoperative complications, particularly related to iatrogenic digital nerve damage [12].

In many large series studies, the use of NSAID as a treatment option for trigger finger has not been evaluated [13, 14]. In the current study, patients who did not accept the recommended invasive and semi-invasive treatments were treated conservatively with oral NSAID, but it was determined from the patient records that dissatisfaction was reported by 76% of Grade 2 patients, by 88% of Grade 3 patients, and by 100% of the Grade 4 patients. This indicates that NSAID treatment was not effective in Grade 2, 3, and 4 patients and treatment with NSAID should be considered as a non-curative symptomatic application with the aim of reducing pain and inflammation.

The application of local corticosteroid injection to Grade 2 patients has been made in many studies and good results have been reported [15-16]. In the current study, satisfactory results were obtained with the application of single dose corticosteroid in 41 (88%) of 46 patients, results supported by similar studies in the literature [17-18]. Good results at a similar rate were obtained in patients at the grade treated with mini open surgery and percutaneous release. Single dose corticosteroid injection could be considered as the first treatment option as it is less invasive and expensive. In 5 patients who did not benefit from the steroid injection in the current study, percutaneous release was then applied. No diagnosis of spontaneous tendon rupture was encountered in any case in the current study population.

Although there are publications reporting very good results in open and percutaneous surgical treatment of trigger finger, there are also studies that have reported infection, scar formation, and delayed return to work in open surgery and incomplete release and iatrogenic digital nerve injury in percutaneous treatment [4, 5, 6].

In a study, Diab applied percutaneous release to 43 patients diagnosed with Grades 2 and 3 trigger finger. While complete release was obtained in 40 patients, incomplete release was reported in 3 patients. No vascular nerve complications or flexor tendon damage that would cause functional loss were encountered [19]. In the current study, following percutaneous release in patients with Grade 3 trigger finger, unwanted side effects were observed of temporary joint stiffness in 3 of 41 patients and temporary hyperalgesia in 4. No digital nerve injury was observed in any case. Of the 41 patients, 38 were pleased with the result. Following the application of mini open surgery to 43 patients with Grade 3 trigger finger, temporary joint stiffness was observed in 8 cases, bowstring in the flexor tendon in 2, and temporary digital nerve damage in 1. In the Grade 3 steroid application group, 16 (24.7%) of the 38 patients were not satisfied with the result. Based on the results of this study, percutaneous release can be considered to be a preferable treatment option for patients with Grade 3 trigger finger as this technique had higher rates of patient satisfaction, it is less invasive than mini open surgical release, and fewer postoperative complications were seen.

In a study by Lepegue et al. of 60 patients, corticosteroid injection was applied to 10 patients with persistent symptoms after percutaneous A1 pulley release. Of these patients, 7 benefitted from the injection and symptoms were reported to have continued in only 3 patients [20]. In the same study, percutaneous A1 pulley release was performed on 10 cadavers before the application was performed on patients and it was observed that none of the A1 pulleys was completely released. From this study it can be considered that when including symptoms that could be eliminated following percutaneous release, in patients where there is partial persistence of symptoms, the application of corticosteroid injection could completely eliminate symptoms. In the current study, when patients did not sufficiently benefit from percutaneous release and recurrence developed, rather than steroid injection, A1 pulley release was applied with a mini open incision. In the study by Lepegue et al., as 70% success was achieved with the application of corticosteroid to patients who had not seen benefit from percutaneous release and

for whom recurrence had occurred, this suggests that the less invasive method of corticosteroid injection could be considered as an alternative before mini open surgery.

In a study by Shinomiya et al., the efficacy of steroid injection was compared in cases of trigger finger with and without contracture and it was shown that the efficacy of the steroid injection was significantly low in advanced stage patients with contracture [13]. In the current study, the results of steroid injection to Grade 4 cases were not satisfactory. The application of percutaneous release and mini open surgical release in Grade 4 patients was determined to be more effective than the application of corticosteroid injection (Figure 4). In a comparison of surgical techniques, more satisfactory clinical results were seen to have been achieved with the mini open release technique. However, a noticeable disadvantage of this technique is a delayed return to work.

In the light of the data obtained in this study, it was seen that as the grade increased in the pathology of trigger finger, more satisfactory results were provided by more invasive treatment options to eliminate the negative effects on functional performance and kinematics. While local corticosteroid injection provided sufficient and satisfactory clinical results in Grade 2 cases, it was observed that in Grade 4, the most satisfactory results were obtained from the application of the mini open release technique. These results strengthen the view that it is necessary to use different treatment options according to grade in the treatment of trigger finger.

Conclusion

In Grade 2 or higher pathology of trigger finger, oral NSAIDs show no curative effect in the treatment of trigger finger. Although satisfactory results were obtained with local corticosteroid injection at all grades, as the grade increases, the efficacy is reduced and recurrence rates may increase. At all grades, percutaneous release and mini open release were similar in respect to the clinical results and were seen to be the most effective treatment options. For Grade 3 patients, percutaneous release can be preferred as the treatment option because of low complication rates.

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