

Interest of Open Surgical Treatment in Trigger Fingers Resistant to Corticosteroid Injections (About 20 Cases)

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Abstract

Background: The aim of this study is to draw up the epidemiological profile of our patients, to estimate our results of the open resection of A-1 pulley and to show the interest of the surgical treatment in trigger fingers which are resistant to corticosteroid injections.

Methods: It is a retrospective study made through the analysis of 20 exploitable files among several cases of trigger fingers, between January 2003 and October 2015. We included in our study patients aged of more than 18 years old, having symptoms dating of 6 months at least, and who have already benefited from at least one corticosteroid injection.

Results: All our patients benefited initially from one or two injections. The use of surgery was indicated in the persistence of symptoms. The criteria of evaluation included the size of the skin incision, the pain, the residual symptoms, the satisfaction and the complications. The opening of the pulley A1 was done in all the patient cases, coupled with the premature active and passive mobilization, this was successful in all cases with satisfying Quick DASH score achieved after 3 months and 6 months postoperatively.

Conclusion: The resection of A-1 pulley gives good results with an unimportant rate of complications and the surgical indication seems to be accepted when the symptoms persist after medical treatment by corticosteroid injection.

Keywords: Trigger Finger; Open Release; A1 pulley; Corticosteroid

Introduction

The trigger finger is a stenosing digital tenosynovitis, most often involving a "catching" of the flexor tendon (s) in its sheath, usually at the A1 pulley [1,2].

It is relatively common in middle-aged women around the fifth decade but it can sometimes touch children [2-4]. This pathology which predominates at the level of the thumb is mostly idiopathic [1]. It is often associated with pain and functional discomfort. The therapeutic modalities are different according to the teams but a large percentage of the trigger fingers are treated successfully

by one or two injections of corticosteroids [2]. Surgical release is usually indicated when medical treatments have failed; thus, the opening of pulley A1 can be performed either open-paceably or percutaneously or by endoscopic treatment [1,3,4].

The aim of this study is to establish the epidemiological profile of our patients and to evaluate and compare our results of open resection of the A1 pulley through a review of the literature.

Patients and Methods

We report a monocentric retrospective series made through the analysis of 20 usable records among several trigger finger cases admitted between January 2003 and October 2015.

We have analyzed the records by using an operating card. We included in our study patients aged 18 years and over, having symptoms old of 6 months at least, and having already received at least one corticosteroid injection.

Data collected was processed using Microsoft Office Excel software, and then validated for analysis by Epi info software (version 7).

Results

There were 16 women and 4 men, with an average age of 51.5 years (ranging from 18 to 85 years). The right side was affected in 12 cases (60%); whereas, the left side was affected in 8 cases (40%).

8 patients, that is 40 % of the cases had a professional activity at the time of surgery: 2 primary school teachers, 2 students, 1 patient exercising manual labor requiring precision (seamstress), a patient of manual labor requiring strength (construction worker) and 2 drivers (truck, taxi). 12 patients, that is 60 % were unemployed (10 were housewives and 2 retired).

The finger affected by the symptoms was thumb in 13 cases, middle finger in 2 cases, ring finger in 4 cases and the 4th finger in one case. The dominant hand was involved in 12 cases, and all patients were right-handed. The symptoms appeared averagely 2 years (1 to 4 years) before surgery. Four patients had pathological conditions which predisposed them to the occurrence of a trigger finger (Diabetes, hypertension, rheumatoid arthritis).

All the patients underwent surgery because of a typical symptomatology: 5 fingers had simple clings to movements, 11 fingers were blocked in flexion, which 8 of them were actively corrected and 3 others were passively corrected, 4 fingers were blocked in flexion with no possibility of correcting the deformation. The blockages were accompanied by pains for 12 fingers.

A quick DASH (disability of the arm shoulder hand) questionnaire was used to assess the impact of pathology on daily activities (Table 1).

Score	Percentage
score from 21 to 40	20%
score from 41 to 60	70%
score more than 61	10%

Table 1: The quick DASH preop.

In our series, the opening of pulley A1 was carried out in all the patients, coupled with the early active and passive mobilization; this was successful in all cases (100% of cases).

A transverse or oblique pathway was used when incising the pulley in all cases at the level of the distal palmar fold (Figure 1) and the size of the incision is on average 12 mm (extremes ranging from 10 to 18 mm).



Figure 1: Photo illustrating the cutaneous approach.

After dissection, the proximal pulley and the flexor tendons were exposed. On the thumb, the marking of the collateral pedicles was carried out first-line before the pulley and the flexor tendon were exposed.

We performed two types of gestures on the pulley A1: - A section of the pulley A1 was made 2 times (2 inches) approximately at 1 cm of the fibrous flexor tendon, the

sheath being respected. A partial excision of the pulley A1 20 times (Figure 2).

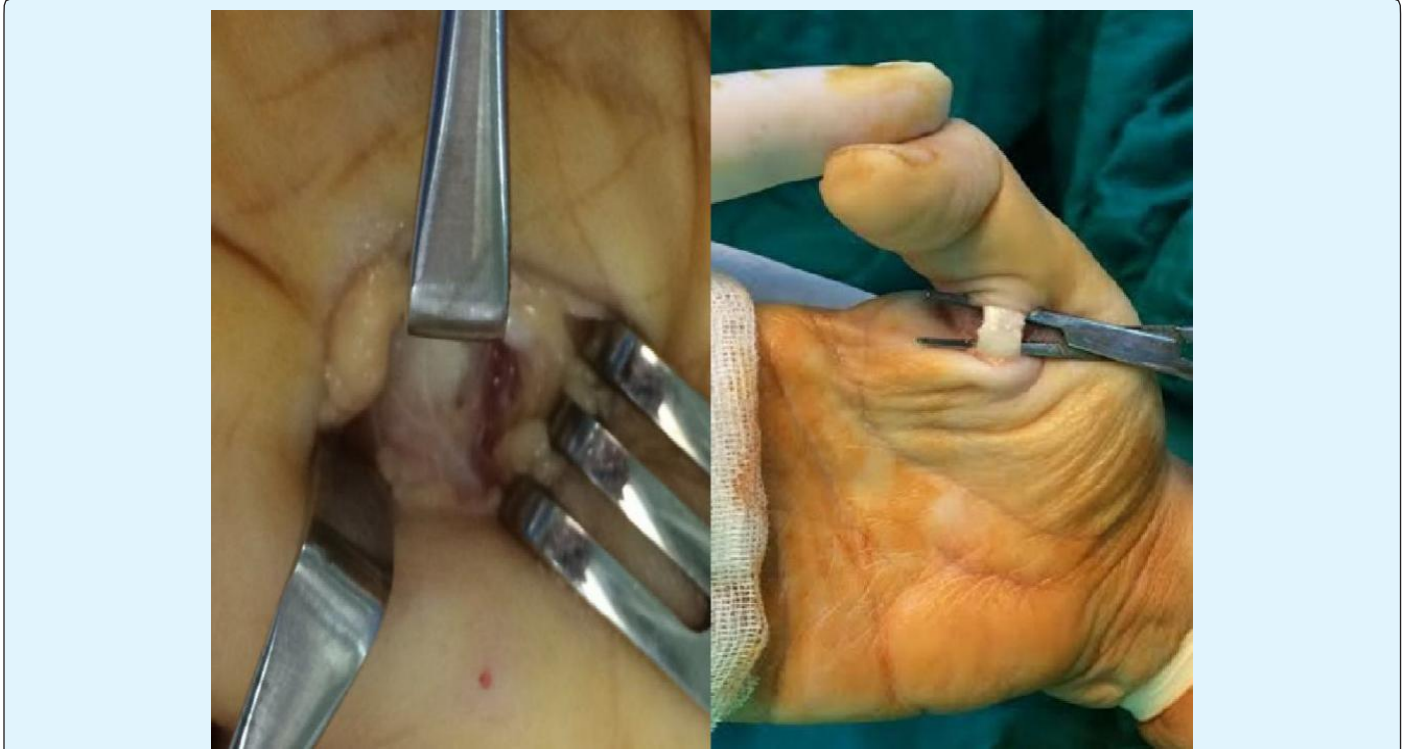


Figure 2: Photo showing a release-excision of the pulley.

Preoperatively, a synovial ganglion (ganglion cyst) was found against T1 at the level of the thumb, and when A1 and A0 were released at the third finger, a tenosynovitis was found. In one case a regularization of the flexor tendon was performed in the pre-rupture phase.

A bending test is performed in immediate peroperative situation, with active and / or passive hyperflexion: tendon gliding or traction.

In one case the tendon is found in pre-rupture and has been sutured (stitched), and then the skin has been closed only.

No immobilization was used in postoperative follow-up. Therefore, the patients were asked to actively mobilize their fingers as soon as anesthesia was lifted or removed.

Concerning the functional clinical results, they were evaluated at 2 weeks (after removal of the stitches/threads), at 1 month, at 3 months and at 6 months. At

mean follow-up of 24 months, the blocking was eliminated without recurrence for all patients, and no further treatment was performed. Besides, no residual pain was observed. Range of motion was measured in comparison with that of the same finger on the healthy contra-lateral hand. However, range of motion was normal. A patient with metacarpophalangeal osteoarthritis prior to follow-up surgery had persistent stiffness due to inadequate rehabilitation and physical therapy.

Unfortunately, one patient presented cutaneous disunion due to the negligence when using the dressing and also due to his unbalanced diabetic ground and one patient retained a retracting bridle. No patient had a metacarpophalangeal joint flexion deformity (flessum) during the revision, and no patient had a distal sensory deficit.

All patients resumed their regular activities after the 15th postoperative day with all patients reporting to their previous professions.

A quick DASH score was satisfactory at 3 months (Table 2) and at 6 months postoperatively (Figure 3).

Finally, a subjective "survey on patient satisfaction" was carried out on patients' impression on outcomes: are you "very satisfied", "satisfied", "averagely satisfied" or "not satisfied" with the treatment of your trigger finger? All patients were satisfied with the outcome of treatment.

Score	Percentage
score at 11(*)	80%
score from 12 to 20	15%
score from 21 to 40	5%

Table 2: Evolution of the quick DASH at 3 months.
(*) Value of the best Quick DASH score

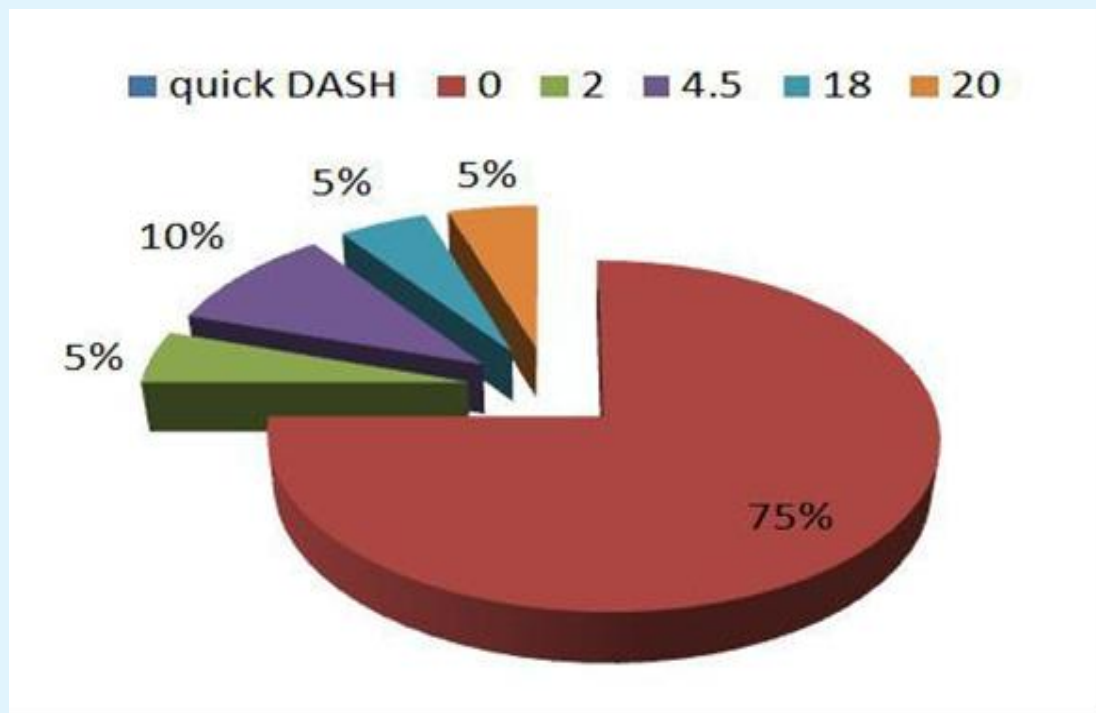


Figure 3: Evolution of the quick DASH at 6 months.

NB: A quick DASH score of 0 means that there are no repercussions on everyday life, and a score of 100 corresponds to maximum discomfort.

Discussion

The trigger finger is a pathology, which is often idiopathic, characterized by a locking of the flexor apparatus at the metacarpophalangeal level facing the pulley A1. Its frequency is estimated at 2.6% of the population. It is also the consequence of an inadequacy between the volume of the flexor tendons and that of the digital canal, mainly in its proximal part [2]. For some patients, the primum movens would be the thickening of the pulley A1 secondary to the repeated micro-trauma, with a deep fibrocartilaginous metaplasia of this pulley that is in chronic phase if we consider it from a histological point of view [5-7].

For other patients, it's the chronic tendinopathy of the flexors that leads to a secondary hypertrophy of this pulley.

The pulley A1 is the first structure that is maintaining the flexor tendons situated under the carpal tunnel and, thus, the first one to undergo the stresses and frictions of these tendons at the level of the fingers. In addition to the predominant micro traumatic involvement, we find sometimes secondary trigger fingers such as: wounds of the flexors with abnormal healing, anatomical variant of the lumbrical muscles [6,9], and general diseases which cause hypertrophy of the sheaths or tendons (polyarthritis, gout, Amyloid deposits,

mucopolysaccharidoses, etc.) [4]. The patient may initially complain of pain when mobilizing his finger, or suffer from discomfort due to a sensation of trigger and / or a decrease in the complete mobility of the finger. The trigger may become painful, and can be localized by the patient and palpated by the practitioner (doctor). Its form is initially a small mobile nodule felt during the mobilization of the finger: in the palm, in metacarpophalangeal (MP) or interphalangeal joints (IP) [2]. In the most severe cases, the finger may remain locked in flexion or extension [2]. The diagnosis of the trigger finger is obvious and easy to pose by a simple clinical examination [2]. Complementary examinations are usually unnecessary.

The main therapeutic methods used to heal the trigger finger are immobilization, corticosteroid injection and / or surgery. Concerning the modalities of surgical treatment, they are very varied [4,8], according to the approach, and surgical technique and despite this diversity, they allow to obtain regularly good and lasting results [2].

Therefore, the modalities of surgical treatment are very varied:

- According to the approach that may be longitudinal for Stefanich and Peimer [9] or transversal for Hodgkinson et al. [10], or punctiform with the percutaneous technique of Lyu [11];
- According to the technique of release that may be a simple opening for Bonnici and Spencer [12], or a resection for Thorpe [13], or plastic enlargement for Kapandji [11,14]. Endoscopic surgery allows an endoscopic section of the pulley A1 by the introduction of an endoscope. This technique requires short postoperative rehabilitation and it is still poorly accessible financially [16].

The open-pole release of the A1 pulley has been used for over 100 years in the treatment of trigger fingers. Under a tourniquet, we make a complete opening of pulley A1 about 1.5 cm by using a short transversal

incision upstream of the pulley A1, without opening the second pulley, that is to say close to the palmar flexion fold, and this, after having located and separated on each side the vasculo-nervous pedicle [10].

This simple opening of the pulley A1 does not cause any misalignment, but if the pulley A2 is also severed, the flexors will take a bowstringing form and cause an ulnar deviation of the finger, especially for the index finger [1].

The partial resection of pulley A1 is a method which consists of excising a rectangular fragment in the longitudinal direction of about 1 cm near the palmar flexion fold of the pulley A1 of the flexor tendon. It is a quick, non-painful move that is usually radical and definitive [2,6].

The plastic enlargement of the metacarpophalangeal pulleys is a very delicate technique, which involves an oblique opening of the pulley A1, followed by a sliding between the two banks, and then we proceed to a closing of the pulley by a few Prolene 4-0 points (sutures, stitches) [2,7,11].

According to the literature: in the Marks series [10], a success rate of 91% is observed for patients treated with steroid injections. However, in the series of Lin et al [17], 84.9% of success is observed in percutaneous needle therapy and 94% of success is obtained in the use of a new percutaneous tenolysis technique in the Werthel, et al. series [18]. On the other hand, in the series of HA, et al. [19], a success rate of 93% was obtained by the use of percutaneous technique by tenotomy. Concerning the series of Hodgkinson, et al. [10], a success rate of 95% of treated cases was achieved by the surgical opening of the pulley, and in the series of Migaud, et al. [15], the plastic enlargement was successful in 93% of cases. But in the series of Bonnici and Spencer [12], a rate of 100% is observed when the resection of the pulley is done. Unlike other series, the technique of partial resection of the pulley A1 gives excellent results since the success rate is also 100% in our patients' cases (Table 3).

Authors	Cases	Technique	Hit rate (%)
Chin-jung lin [19]	126	Percutaneous (needle therapy)	84.9
Ha ki [5]	185	Percutaneous (tenotomy)	93.5
Wen-chih liu [20]	203	Percutaneous alone	99.1
Wen-chih liu [20]	229	Percutaneous + Injections	97.5
Hodgkinson [10]	101	Opening of the pulley	95

Migaud [15]	15	Plastic enlargement	93
Bonnici [12]	75	Resection of the pulley	100
Our serie	20	Resection of the pulley	100

This explains that despite the success rate of corticosteroid injection, the percutaneous technique and plastic enlargement in some patients' cases, surgical resection of the pulley remains the best treatment for a lower risk of recurrence or rupture of the tendon [2]. The surgical release of trigger fingers exposes them to a number of complications, although rare, such as: infection, nerve damage, «bowstringing effect" of flexor tendons, recurrence, scar pain, stiff fingers [2,4].

We notice that the most important complication rate in the literature was published by Thorpe [13] (7%). However, more recent studies have reported a higher success rate [3] and a very low morbidity rate (1%). In our series, we did not observe any major complications, which is not the case for the other experiments.

Conclusion

The trigger finger is a relatively common, benign, easily treated pathology, which symptoms are unfortunately ignored by a large number of physicians, and that often leads to a delayed diagnosis for the patient and consequently a delay in a proper treatment.

Even if we have achieved good results for all our patients, we must take into account the efficiency and the mildness of the injections which do not require any pre-therapeutic assessment and which can be done on an out-of-hospital care (outpatient clinic, ambulatory care).

The surgical indication seems acceptable when symptoms persist after a medical treatment by steroid injection.

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