

SURGICAL TREATMENT AND REHABILITATION OF TRIGGER THUMB AND FINGER

Anna Deskur,^{1, A, D, E} Zbigniew Deskur^{2, B, C}

¹Pomeranian Medical University

²Department of Physical Education and Health Promotion, University of Szczecin

^AStudy Design; ^BData Collection; ^CStatistical Analysis; ^DManuscript Preparation

Address for correspondence:

Zbigniew Deskur

Department of Physical Education and Health Promotion, University of Szczecin

Al. Piastów 40b/6, 71–065 Szczecin, Poland

Email: zdeskur@onet.pl

Abstract The aim of the study was to evaluate the results of surgical treatment and rehabilitation of patients with trigger thumb and finger. In 40 patients, comprising 30 women and 10 men aged 26 to 64, a total of 42 cases of trigger thumb and finger. In the preoperative period, the severity of changes were studied according to the classification developed by Newport et al. Five patients were classified in the first stage, 28 in the second, 6 in the third, and 1 in the fourth. The mean duration of symptoms was five months. The indication for surgery was a lack of improvement following conservative treatment. All of the patients were treated surgically using the open method by cutting the flexor tendon sheath in part A1. The rehabilitation treatment included exercises to improve the range of mobility of the thumb and fingers and to stretch, relax, and strengthen muscles. Neuromobilisation and automobilisation exercises were conducted. After 5 months, swelling, pain and restricted mobility of the thumb and fingers subsided in all patients. There were no 'jumping' symptoms. Apart from a slight transitory inflammatory reaction in 2 patients there were no complications. In patients with trigger finger, open surgery and competent rehabilitation therapy enables the achievement of very good results, with a low complication rate.

Key words trigger thumb and finger, surgical treatment and rehabilitation of trigger thumb and finger

Introduction

Trigger thumb and finger (Latin: tendovaginitis stenosans) is also known as stenosing tenosynovitis of the flexor tendon and its sheath. A characteristic symptom of this disease is an audible crack and frequently perceptible pain in the affected thumb or finger when being bent and straightened. The reason for this is the 'jumping' of a thickened flexor constricted by a fibrous sheath in part A1. The initial 'jumping' can develop into complete blockage at the entrance of the tendon sheath. The disorder often occurs in women around 50 years of age and mostly affects the thumb. The cause of such changes may be frequent repeated, minor injuries and overload of the flexor tendons. Cases of trigger thumb and fingers are common in individuals participating in sport climbing, and tennis, or playing

various instruments involving the fingers. The condition also affects carpenters and people laundering items by hand (Cakmak, Wolf, Bruckner, Hahn, Unglaub, 2012; Lange-Riess, Schuh, Honle, Schuh, 2009).

In the initial phase of the disease, where there are no symptoms of the tendon conservative treatment, involving local and general use of anti-inflammatory drugs is recommended. If there is no improvement following conservative treatment, open or percutaneous surgery is conducted. Surgical treatment achieves better results than conservative treatment, with fewer relapses. Some argue that there is no difference between the results of percutaneous and open surgical treatment (Wang et al., 2013). In trigger thumb syndrome cutting of the annular ligament is done with a thick injection needle. Surgical treatment using the open method produces a 97–99% cure; relapses occur in 2–3% of cases and complications in 2% of patients; however, the percutaneous method results more often in restricted mobility of the fingers, soreness or infection (Finsen, Hagen, 2003; Lange-Riess, Schuh, Honle, Schuh, 2009; Turowski, 1997; Will et al., 2010). Following the surgery, rehabilitation is recommended as soon as possible. Patients are warned against performing excessive gripping movements and lifting heavy objects (Deskur, Deskur, Zawadzki, 2014).

Material and methods

In the years 2006–2013, 40 patients were treated, comprising 30 women and 10 men, aged 26 to 64, with 42 cases of trigger thumb and finger (Table 1).

Table 1. Number of men and women treated with trigger thumb and fingers

| The age of patients in years | Number of patients | | | | Together | |
|---------------------------------|--------------------|------|-----|------|----------|-------|
| | women | | men | | | |
| | n | % | n | % | n | % |
| 21–30 | – | – | 1 | 2.5 | 1 | 2.5 |
| 31–40 | 4 | 10.0 | 1 | 2.5 | 5 | 12.5 |
| 41–50 | 9 | 22.5 | 4 | 10.0 | 13 | 32.5 |
| 51–60 | 17 | 42.5 | 3 | 7.5 | 20 | 50.0 |
| 61–70 | 1 | 2.5 | – | – | 1 | 2.5 |
| Together | 31 | 77.5 | 9 | 22.5 | 40 | 100.0 |

Treatment and testing was carried out at the SP Regional Hospital in Nowogard by the authors. The severity of clinical changes in the thumb and fingers was rated according to the classification of Newport et al. (Cakmak, Wolf, Bruckner, Hahn, Unglaub, 2012) – Table 2.

Table 2. Classification of trigger digits according to Newport et al.

| Stage | Characteristics |
|-------|--|
| 1 | Pain and tenderness on the level of the A1 pulley, no palpable nodule or triggering |
| 2 | Tenderness, swelling or tendon nodularity with occasional triggering or catching during active movements |
| 3 | Manifestations of stage 2 with frequent triggering or catching, additionally locking of the digit |
| 4 | Digit is flexed in the proximal interphalangeal joint |

Limitation of mobility of the thumb and fingers was examined using the Buck- Gramcko classification (Cakmak, Wolf, Bruckner, Hahn, Unglaub, 2012).

Table 3. Classification of severity of limitation of motion finger according to Buck-Gramcko

| Grade | Finger-palm distance | Severity of limitation |
|-------|----------------------|------------------------|
| 0 | 0 | No limitation |
| 1 | >0-2.5 | Light |
| 2 | >2.5-4 | Moderate |
| 3 | >4-6 and fixed digit | Severe |
| 4 | Whole hand | |

The range of motion of the thumb was examined using goniometer (Table 4).

Table 4. Classification of severity of limitation of motion thumb according to Buck-Gramcko

| Thumb (IP-joint) | Range of motion | Severity of limitation |
|------------------|-----------------|------------------------|
| 0 | >70 | No limitation |
| 1 | 50-70 | Light |
| 2 | 30-45 | Moderate |
| 3 | <29 | Severe |

The extent of swelling in the fingers was studied by following the appropriate scale (Table 5).

Table 5. Extent of swelling of thumb and fingers

| Swelling | Severity of swelling |
|----------|---|
| 0 | No swelling |
| 1 | Light, without limitation of motion |
| 2 | Moderate, with limitation of motion |
| 3 | Severe, with limitation of motion of the whole hand |

Pain in the thumb and fingers was assessed using the VAS scale (Table 6).

Table 6. Grade of pain thumb and finger

| VAS | Grade of pain |
|------|---------------|
| 0 | No pain |
| 1-3 | Light |
| 4-6 | Moderate |
| 7-10 | Intense |

All patients were treated with open surgery. A transverse incision of approximately 1 cm was made on the palmar side of the hand circumferentially from the distal palmar flexion crease. On the thumb, an incision was made in the metacarpophalangeal area. The vascular-nervous bunch was moved aside. Following the introduction of the

probe to the entrance of the channel sheath, the thumb was incised with a knife in the initial portion of the A1 sheath. The free passage of the thickened tendon was tested. If needed, tenolysis was performed to remove adhesions (Choudhur, Tay, 2013; Froimson, 1999). On the fourth day following surgery, exercises were cautiously introduced to improve full flexion and to straighten the fingers as well as stretch, relax and strengthen muscles. Neuromobilisation and automobilisation exercises were conducted. The soft tissue surrounding the scar was mobilised. Patients were taught how to prevent overloads of the fingers (Deskur, Deskur, Zawadzki, 2014; Kuźdżał, 2009).

Results

Forty-two cases of trigger thumb and fingers in 40 patients, treated with surgery and rehabilitation were studied. The changes affected 24 fingers on right hands and 18 on left hands. The finger most frequently affected by changes was I (21 cases), followed by IV (10) and III (9) – Table 7.

Table 7. Number of men and women treated with trigger thumb and fingers

| Thumb and fingers | Numer of hands | | | | Together | |
|-------------------|----------------|------|------|------|----------|-------|
| | right | | left | | | |
| | n | % | n | % | n | % |
| I | 12 | 28.6 | 9 | 21.4 | 21 | 50.0 |
| II | – | – | – | – | – | – |
| III | 5 | 11.9 | 4 | 9.5 | 9 | 21.4 |
| IV | 5 | 11.9 | 5 | 11.9 | 10 | 23.8 |
| V | 2 | 4.8 | – | – | 2 | 4.8 |
| Together | 24 | 57.1 | 18 | 42.9 | 42 | 100.0 |

The mean duration of symptoms was 5 months. Prior to surgery, the severity of changes in lesions thumbs and fingers was assessed according to the classification of Newport et al. (Cakmak, Wolf, Bruckner, Hahn, Unglaub, 2012). Most patients were characterized by the second level of severity (Table 8).

Table 8. Number of patients with varying degrees of severity changes hands trigger thumb and fingers according to the classification of Newport before surgery

| Degrees | Number of patients | |
|----------|--------------------|-------|
| | n | % |
| 1 | 5 | 12.5 |
| 2 | 28 | 70.0 |
| 3 | 6 | 15.0 |
| 4 | 1 | 2.5 |
| Together | 40 | 100.0 |

Following surgery, and during rehabilitation, a study of persisting symptoms, such as swelling, pain and limitation of movement of the thumb and fingers, was carried out. After 1 month, 15 patients were symptom-free. In the third month of the study, pain subsided; after 5 months, swelling and limitation of movement disappeared (Table 9). All patients were very satisfied with the results of the treatment.

Table 9. The number of thumb and fingers with persisting symptoms after the surgery

| Degrees | The number of thumb and fingers that with persisting symptoms in the coming months scrutineering | | | |
|---------------------------|--|----|---|---|
| | 1 | 2 | 3 | 5 |
| Swollen | 25 | 12 | 1 | 0 |
| Pain of thumb and fingers | 4 | 2 | 0 | |
| Restriction of mobility | 7 | 3 | 1 | 0 |
| Pain regional scars | 6 | 1 | 0 | |

Discussion

In this study, cases of trigger thumb and fingers were more common in women aged 51 to 60 and involved the thumb and fingers III and IV, which is consistent with other reports (Cakmak, Wolf, Bruckner, Hahn, Unglaub, 2012; Choudhury, Tay, 2013; Lange-Riess, Schuh, Honle, Schuh, 2009; Moriya, Uchiyama, Kawaji, 2005). Surgical treatment of trigger thumb and finger is indicated by lack of improved results following conservative treatment. Incision of the initial part of the flexor tendon sheath can be done using either the open or percutaneous method. While the presently recommended treatment is percutaneous, many authors see no significant difference between the results of the two methods (Wang, Zhao, Liang, 2013). The open surgery method enables better control of the tendon and the opportunity to carry out additional procedures where necessary. In our study, swelling, pain and restricted mobility of the thumb and fingers subsided after 5 months in all patients. There were no signs of 'jumping'. Apart from slight transient inflammatory reaction in 2 patients there were no complications. In recent years, not many results of open-method surgical treatment of trigger thumb and fingers have been published. I will cite some of these here. Papież, Trybus, Stepańczak, Łoboda, Pokrowiecki, Gądek (2013) studied 50 patients undergoing surgery and recorded that after 3 months most patients achieved total restoration of motion in their thumbs and fingers, full dexterity, and hand grip strength, as well as the abolition of pain. Further improvement was shown after a year had passed. The majority (84%) of patients were very satisfied with the treatment. Choudhury and Tay (2013) found that 25 months following surgery 216 thumbs and fingers had achieved average mobility 84% according to TAM. One patient experienced minor wound dehiscence. Patients undergoing tenolysis also experienced worse results. Cakmak, Wolf, Bruckner, Hahn, Unglaub (2012) reported that 6 months following operations on 117 thumbs and fingers all symptoms had disappeared. One patient experienced dysaesthesia and 2 experienced inflammation of the wound. Lim, Lim, Rasheed, Narayanan, Beng-Hoi (2007) reported that 483 patients had achieved good results 6 months after surgical treatment, with minor complications in 1% of patients. There was no recurrence 'jumping'. Moriya, Uchiyama, Kawaji (2005) studied 110 fingers and reported that 3 weeks after surgery 64% of the fingers were characterized by limited mobility in the PIP joint and patients felt pain while flexing and extending the fingers. None had trigger fingers.

Conclusions

1. Cases of trigger thumb and finger are most common in women aged 51 to 60 and involve the thumb and fingers III and IV.
2. Lack of improvement following conservative treatment of trigger thumb and finger is an indication for surgery.

3. Open surgery of the thumb and fingers and competent rehabilitation treatment enables a significant and rapid improvement in the efficiency of the hand, with a relatively low rate of complications.

4. In the treatment of trigger thumb and finger, the best results can be achieved in patients treated by a team of specialists.

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