Surgical release of trigger fingers: Experience of a district general hospital in Brunei Darussalam

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ABSTRACT

Introduction: Trigger finger is a common finger aliment. It is caused by inflammation and subsequent narrowing of the first annular (A1) pulley producing a difference in diameters of a flexor tendon and its retinacular sheath. This causes pain, clicking, catching, and loss of motion of the affected finger. **Materials and Methods:** A retrospective study of 53 cases of trigger fingers of 41 patients who were managed surgically. Analysis of the gender, predominance of hand, age, symptoms and signs, surgical outcomes and complications were carried out. **Results:** The mean age of the patients was 51.8 (28-79) years. There were 18 (43.9%) male and 23 (56.1%) female patients. The middle finger was the most commonly affected (37.7%, n= 20), followed by the ring finger (24.5 %, n=13), thumb (24.5%, n=13) and index finger (13.2%, n=7). Symptoms resolved completely with full range of motion of joints after the surgical release without complications like tendon injuries and neuroma. Two patients complained of pain at the operative site after three months of surgery which was successfully managed with analgesics. **Conclusion:** Surgical intervention by the release of A1 pulley is an ideal option for the management of trigger fingers with minimal complications.

Keywords: Trigger finger, trigger digit, surgical management, A1 pulley

INTRODUCTION

Stenosing tenosynovitis, or trigger finger, is an entity seen commonly by Orthopaedic surgeons. This problem is due to a discrepancy between the flexor's circumference and that of its pulley system at the metacarpophalangeal level. [1-3] Phalangeal flexion, when associated with grip strength, causes a strong tendon angulation pull in correspondence to the distal pulley margin and the most important alterations fall on the pulley, in which one can see an enormous hypertrophy that has been described by Bunnel as "a white ring scar thickening". [4] Microscopic examinations demonstrate a cystic type of degenerative formation and the accompanying fibers with lymphocyte infiltration and plasmatic cellular formation. [5]

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Although simple and with low morbidi-

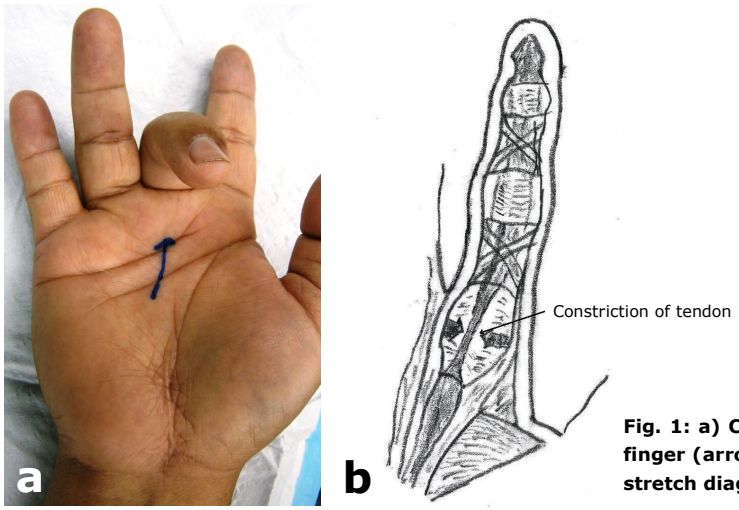

Fig. 1: a) Clinical picture of locked trigger of middle finger (arrow) in a 60-year-old female lady and b) a stretch diagram of trigger finger.

ty, treatment of trigger finger has a high rate of failure and repeated injections may be required. [6, 7] Some also claimed that conservative treatment did not work. [8, 9] There are also reports of managing trigger finger with percutaneous releasing of first annular (A1) pulley. [10, 11] If the patient tends to assume a flexion posture of the finger, over time, secondary proximal phalanx flexion rigidity sets in. Clinical pictures of trigger finger and stretch diagram are shown in Figures 1a and 1b.

Surgical release of the A1 pulley is indicated when non-operative treatments fail. [12] We report our experience of surgical release of trigger fingers in adult patients in a district general hospital in Brunei Darussalam.

MATERIALS AND METHODS

This is a study done at the Department of Orthopaedics and Trauma Surgery of Suri Seri Begawan Hospital, Kuala Belait, Brunei Darussalam. From February 2011 to January 2012, a total of 53 cases of trigger fingers of 41 patients whose fingers were managed surgically were reviewed retrospectively. All patients underwent a trial of conservative treatment including oral non-steroidal anti-inflammatory drugs (NSAIDs) for one month and a dose of steroid infiltration. Patients aged less than 18 years and who had multiple times of steroid injections were excluded from this study. Also excluded were patients who had trigger finger after sustaining trauma and injuries. The mean follow up time of the patients was 8.7 (range 5 to 15) months after the surgical release.

RESULTS

There were 18 men (43.9%) and 23 women (56.1%) with a mean age of 51.8 years (range 28 to 79).

A total of 44 hands were involved with 54.6% (n=24) of those affected in the dominant hands. The right side was involved in 52.3% (n=23) and the left side in 47.7% (n=21) cases including three patients who had bilateral involvement. Six patients (13.6%) had more than one finger affected. The middle finger was the most commonly affected, followed by the ring finger, thumb and index finger.

Among all the patients, 19 (46.3%)

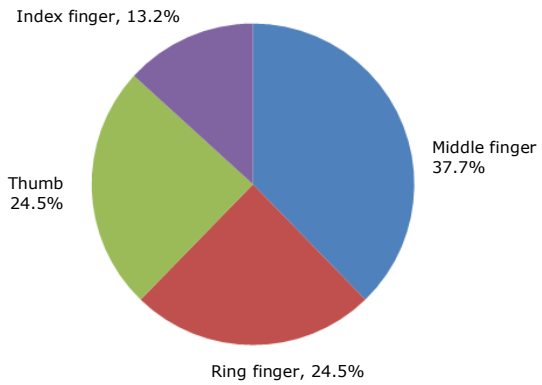

Fig. 2: Breakdown of digit involvement.

had co-morbidities: diabetes mellitus, hypertension and hyperlipidemia. Of these, six patients (14.6%) had diabetes mellitus.

No major intra-operative complications such as tendon or nerve injuries were encountered. Symptoms such as pain and locking of the affected fingers resolved completely with the surgical release. No delayed major complications such as tendon injuries and neuroma were encountered. However, two patients experienced pain at the operative site after three months post surgery but the symptoms resolved completely with NSAIDs.

DISCUSSION

Trigger finger is a common cause of hand pain and disability. Non-operative treatment, including splinting and local steroid injection, is useful for short-term stenosing tenosynovitis. Patients who do not respond to non-operative treatment can usually be treated successfully with surgery. [13] In this study the most commonly involved finger was the middle finger. The dominant hands were affected more than the non-dominant. Three patients had bilateral involvement and six patients had more than one finger affected. Among our patients, 46.3% of our patients had comorbidities such as diabetes mellitus and hypertension.

The recurrence rates for non-operative treatment such as local infiltration with steroid is very high. [14] Open trigger release is the standard technique for orthopaedic surgeon as it gives full visualisation of both the A1 pulley and the neurovascular structures. [8]

Trigger finger can occur in anyone but it is seen more frequently in patients with underlying diabetes mellitus and in women in their fifth to sixth decade of life. [15] In our study, the mean age of patient was 51.8 years and women accounted for 56.1%. The reasons for this age and gender predilection are not entirely clear. [16] The lifetime rise of trigger finger development is estimated to be between 2% and 3%, but increases to up to 10% in patients with diabetes mellitus. [17] In our study, 14.6% of patients had underlying diabetes mellitus and recent studies have shown that the incidence of this disease is not significantly correlated with manual strain, trauma, body mass index (BMI), hand dominance or concomitant diseases like diabetes mellitus, rheumatoid arthritis, renal insufficiency, and hypothyroidism. [18]

The incidence on the dominant hand was 54.5% and bilateral involvement was 6.4%. Other studies have also shown higher incidence in the dominant hand, [18, 19] which is comparable with this study.

In our study, the middle finger was the most commonly affected (37.7%), followed by ring finger, thumb and index finger. Bamroongshawgasame *et al*. [13] also reported

a high incidence on the middle finger followed by the thumb, ring, index and little finger. Moore *et al.* [19] reported the highest incidence of triggering on the ring finger followed by thumb, middle finger and index finger.

The indication for surgical treatment of trigger finger is after failure of conservative treatment to resolve pain and symptoms. [14, 15] The timing of surgery is somewhat controversial with data suggesting surgical consideration after failure of corticosteroid injection. [20] In this study we only operated after giving at least one dose of steroid injection which is similar to recommendations in the literature.

Symptoms resolved completely with surgical release without complications like tendon injuries, nerve injury, bowstringing, continued triggering. Paul *et al*. [21] reported the high success rate of trigger finger release under local anaesthesia in the long term follow up (average time of follow up was 14.3 years in his study). Lim *et al*. [22] reported a 1% complication rate and these included superficial wound, extension lag and postoperative residual stiffness in his large series. Sreedharan *et al*. [23] reported one case of neuroma formation after nerve injury in trigger release surgery. The result of operative treatment for trigger fingers obtained was excellent with full range of motion of fingers joints, no residual triggering and no nerve injury. This result is comparable with the literature. [20-23]

The main limitation of our study is that the follow up period was not as long as those reported in the literature and the results were retrospectively analysed. Ideally the analysis should have been done prospectively with a much longer follow-up period.

In conclusion, surgical release of trigger finger is a short, safe and effective procedure when performed after failure of conservative treatment and steroid infiltration. This procedure has a few complications with a high success rate.

REFERRENCES

1: Freiberg A, Mulholland RS, Levine R. Non-operative treatment of trigger fingers and thumbs. J Hand Surg Am. 1989; 14:553-8.

2: Kolind-Sorensen V. Treatment of trigger fingers. Acta Orthop Scand. 1970; 41:428-32.

3: Wood MB, Dobyns JH. Sports related extra-articular wrist syndromes. Clin Orthop Relat Resear. 1986; 202:93-102.

4: Bunnell S. Injuries of the hand. Surgery of the hand. Bunnell S (Ed) JB Lippincott Co, Philadelphia. 1944. pg 496-9.

5: Fahey JJ, Vollinger JA. Trigger-finger in adults and children. J Bone Joint Surg Am 1954; 36:1200 –18.

6: Quinnell RC. Conservative management of trigger finger. Practitioner. 1980; 224:187-90.

7: Newport ML, Lane LB, Stuchin SA. Treatment of trigger finger by steroid injection. J Hand Surg Am. 1990; 15:748-50.

8: Ger E, Kupcha P, Ger D. The management of trigger thumb in children. J Hand Surg Am. 1991; 16:944-7.

9: Skov O, Bach A, Hammer A. Trigger thumbs in children: a follow-up study of 37 children below 15 years of age. J Hand Surg Br. 1990; 15:466-7.

10: Ha KI, Park MJ, Ha. Percutaneous release of trigger digits: A technique and results using specially designed knife. J Bone Joint Surg Br. 2001; 83:75-7.

11: Cebesoy O, Karakurum G, Kose KC, Baltaci ET, Isik M. Percutaneous release of the trigger thumb: is it safe, cheap and effective? Intern Orthop. 2007; 31:345-9.

12: Lange-Riess D, Schuh R, Hönle W, Schuh A. Long-term results of surgical release of trigger

finger and trigger thumb in adults. Arch Orthop Trauma Surg. 2009; 129:1617-9.

13: Bamroongshawgasame T. A comparison of open and percutaneous pulley release in triggerdigits. J Med Assoc Thai. 2010; 93:199-204.

14: Rozental TD, Zurakowski D, Blazar PE. Trigger finger: prognostic indicators of recurrence following corticosteroid injection. J Bone Joint Surg Am. 2008; 90:1665-72.

15: Makkouk AH, Oetgen ME, Swigart CR, Dodds SD. Trigger finger: etiology, evaluation, and treatment. Curr Rev Musculoskelet Med. 2008; 1:92-6.

16: Stahl S, Kanter Y, Kamielli E. Outcome of trig–ger finger treatment in diabetes. J Diabetes Complicat. 1977; 11:287-90.

17: Strom L. Trigger finger in diabetes. J Med Soc NJ. 1977; 74:951-4.

18: Cakmak F, Wolf MB, Bruckner T, Hahn P, Unglaub F. Follow-up investigation of open trigger digit release. Arch Orthop Trauma Surg. 2012; 132:685-31.

19: Moore JS. Flexor tendon entrapment of the digits (trigger finger and trigger thumb). J Occup Environ Med. 2000; 42:526-45.

20: Benson LS, Ptaszek AJ. Injection versus surgery in the treatment of trigger finger. J Hand Surg Am. 1997; **22:**138-44.

21: Paul AS, Davies DR, Haines JF. Surgical treatment of adult trigger finger under local anaesthetic: the method of choice? J R Coll Surg Edinb. 1992; 37:341-2.

22: Lim MH, Lim KK, Rasheed MZ, Narayanan S, Beng-Hoi Tan A. Outcome of open trigger digit release. J Hand Surg Eur. 2007; 32:457-9.

23: Sreedharan S, Teoh LC, Chew WY. Neuroma of the radial digital nerve of the middle finger following trigger release. Hand Surg. 2011; 16:95-7.