Diagnosis and Treatment of Trigger Finger in Brazil – A Cross-Sectional Study

Diagnóstico e tratamento do dedo de gatilho no Brasil - Estudo transversal

Paulo Henrique Jeronimo da Silva¹  Vinicius Ynoe de Moraes¹  Nicolau Granado Segre¹
Edson Sasahara Sato¹  Flávio Faloppa¹  João Carlos Belloti¹

¹ Orthopedics and Traumatology Department, Escola Paulista de Medicina, Universidade Federal de São Paulo, São Paulo, Brazil

Abstract

Objective  The present paper aims to evaluate the therapeutic planning for trigger finger by Brazilian orthopedists.

Methods  This is a cross-sectional study with a population composed of participants from the 2018 Brazilian Congress on Orthopedics and Traumatology (CBOT-2018, in the Portuguese acronym), who answered a questionnaire about the conduct adopted for trigger finger diagnosis and treatment.

Results  A total of 243 participants were analyzed, with an average age of 37.46 years old; most participants were male (88%), with at least 1 year of experience (55.6%) and from Southeast Brazil (68.3%). Questionnaire analysis revealed a consensus on the following issues: diagnosis based on physical examination alone (73.3%), use of the Quinnell classification modified by Green (58.4%), initial nonsurgical treatment (91.4%), infiltration of steroids combined with an anesthetic agent (61.7%), nonsurgical treatment time ranging from 1 to 3 months (52.3%), surgical treatment using the open approach (84.4%), mainly the transverse open approach (51%), triggering recurrence as the main nonsurgical complication (58%), and open surgery success in >90% of the cases (63%), with healing intercurrences (54%) as the main complication. There was no consensus on the remaining variables. Orthopedists with different practicing times disagree on treatment duration (p = 0.013) and on the complication rate of open surgery (p = 0.010).

Conclusions  Brazilian orthopedists prefer to diagnose trigger finger with physical examination alone, to classify it according to the Quinnell method modified by Green,
Introduction

Trigger finger (stenosing flexor tenosynovitis) was a term first proposed by Notta in 1850. This condition is a common cause of hand pain, which can result in limited finger, edema, discomfort, and disability, with a “triggering” sensation.

Trigger finger is characterized by blocked sliding movements of the flexor tendon during finger flexion and extension. These pathological changes lead to a discrepancy between the relative size of the flexor tendon and its tendon sheath, resulting in an inability to flex or extend the finger comfortably. The annual incidence of trigger finger in the general population is of 28 per 100,000 people. Among adults, women at the 5th and 6th decades of life are the most affected by trigger finger. In addition, trigger finger epidemiology is associated with other conditions, including rheumatoid arthritis, gout, carpal tunnel syndrome, De Quervain disease, and diabetes mellitus. The classic “click” and locking presentation of a trigger finger is typically sufficient for its diagnosis. However, certain cases require a differential diagnosis from other conditions, such as tendon sheath infection, calcific peritendinitis or periarthritis. Ultrasonography or magnetic resonance imaging (MRI) can aid in the differential diagnosis of these cases.

Currently, there are several treatment options available for trigger finger, including noninvasive and surgical procedures. Infiltrations are often recommended as the first line of treatment, using several drugs, including steroids and hyaluronic acid, with similar outcomes. Despite the good outcomes from the steroid treatment, many patients with trigger finger still require surgical therapy. Sato et al. compared steroid injections with percutaneous and open surgical techniques for pulley release to treat trigger finger. Patients treated with steroids presented a cure rate of 86% after 2 injections, whereas all surgical patients were cured.
Even though trigger finger is epidemiologically relevant in orthopedics and traumatology, there is no standardized, uniform clinical conduct to classify, diagnose and treat this condition. Thus, the present study aimed to evaluate diagnosis and treatment methods for trigger finger adopted by Brazilian orthopedists.

**Materials and Methods**

**Study Type**

Cross-sectional, analytical, observational study carried out in the Department of Orthopedics and Traumatology, Hospital São Paulo, Universidade Federal de São Paulo (UNIFESP, in the Portuguese acronym), São Paulo, Brazil, from August 2018 to August 2019. The present study was approved by the Research Ethics Committee under the number CAAE 11957619000005505. It was carried out during the 2018 Brazilian Congress of Orthopedics and Traumatology (CBOT-2018, in the Portuguese acronym). Brazilian orthopedists and residents from orthopedics and traumatology programs, both males and females, present at CBOT-2018, who agreed to answer the questionnaire and signed the informed consent form (ICF) were included in the study. Participants from other nationalities, nonparticipating physicians, and subjects with incomplete information were not included.

**Questionnaire Application**

Participants were given a questionnaire with 15 questions regarding their demographics and the conduct adopted for trigger finger diagnosis and treatment (►Appendix 1).

**Statistical Analysis**

Sample size was calculated at 230 participants considering a 5% sampling error and a 95% confidence level. Proportional homogeneity was analyzed using the chi-squared test or the Fisher exact test. The three groups of respondents were compared using analysis of variance (ANOVA). The results were analyzed with SPSS Statistics for Windows Version 16.0 (SPSS Inc., Chicago, IL USA) and GraphPad Prism 5.0 (GraphPad Software, San Diego, CA, USA) with significance set at $p < 0.05$.

**Results**

The study population was composed of 243 participants. Most participants were male (88%; $n = 212$), with at least 1 year of experience in their specialties (55.6%; $n = 145$). The majority of the participants were orthopedics residents (37.4%; $n = 91$) with subspecialization in trauma (19.8%; $n = 48$). The mean age of the participants was 37.46 years old. Most of them were from Southeast Brazil (68.3%; $n = 155$) (►Table 1).

**Table 1 Demographics of the respondents**

| Variables               | N   | %   |
|-------------------------|-----|-----|
| **Gender**              |     |     |
| Female                  | 29  | 12.0|
| Male                    | 212 | 88.0|
| Unknown                 | 2   |     |
| **Brazilian region**    |     |     |
| Southeast               | 155 | 63.8|
| Northeast               | 28  | 11.5|
| South                   | 28  | 11.5|
| Central-West            | 18  | 7.4 |
| North                   | 14  | 5.8 |
| **Practicing time**     |     |     |
| Resident                | 98  | 40.3|
| Up to 1 year            | 10  | 4.1 |
| 1-5 years               | 35  | 14.4|
| 5-10 years              | 26  | 10.7|
| > 10 years              | 74  | 30.5|
| **Specialty**           |     |     |
| Orthopedics Residence   | 91  | 37.4|
| Trauma                  | 48  | 19.8|
| Knee                    | 24  | 9.9 |
| Hand                    | 17  | 7   |
| Hand Surgery Residence  | 12  | 4.9 |
| Shoulder/Elbow          | 11  | 4.5 |
| Spine                   | 10  | 4.1 |
| Pediatrics              | 8   | 3.3 |
| Foot/Ankle              | 7   | 2.9 |
| External Fixation       | 5   | 2.1 |
| Hip                     | 5   | 2.1 |
| Bone Tumor              | 4   | 1.6 |
| Sports Trauma           | 1   | 0.4 |
| **Mean age (years old)**|     |     |
| 37.46 ± 11.01           | Minimum | Maximum |
| 24.00                   | 79.00 |

Trigger finger was diagnosed by 73.3% ($n = 178$) of the respondents by locking observation during physical examination, and by 25.5% ($n = 62$) of the respondents based on physical examination and ultrasonography findings. For trigger finger classification, 58.0% ($n = 142$) of the respondents used the Green system, whereas 19.0% ($n = 46$) of them adopted the Quinell method. Regarding initial treatment options, most orthopedists selected nonsurgical methods, mainly physical therapy (46.5%; $n = 113$), followed by infiltration at the A1 pulley (31.7%; $n = 77$). Steroids and anesthetic agent combinations were the preferred treatment (61.70%; $n = 150$), and these infiltrations were mostly administered once (34.1%; $n = 83$) or twice (34.9%; $n = 97$). Treatment duration ranged from 1 to 3 months for most respondents (52.30%; $n = 127$). Among surgical treatment options, the open transverse approach (51.0%; $n = 124$) was the preferred procedure. The anesthesia protocol most reported by the respondents was sedation with local anesthetic administration (38.7%; $n = 94$) (►Figure 1).

Regarding success and complications from different treatment options, 46.6% ($n = 112$) of the respondents reported a...
success rate ranging from 30 to 60% for nonsurgical treatment; triggering recurrence was the most frequently reported complication (58.0%; n = 140). Percutaneous surgery had a success rate ranging from 60 to 90% for 43.0% (n = 104) of the respondents, and its most common complication was triggering recurrence (48.0%; n = 117). In contrast, open surgery had a success rate > 90.0% for 63.0% (n = 154) of the respondents, with healing intercurrences (54.0%; n = 130) as the most frequently reported complication (∆Figure 2).

To determine whether the clinical practicing time influenced the answers of the participants, the sample was divided into 3 groups: orthopedics residents (n = 98), clinical practice time ≤ 5 years (n = 45) and clinical practice time > 5 years (n = 100). All groups presented a higher frequency of male professionals, and the resident group (21.4%; n = 21) had the highest proportion of female participants compared with the remaining groups, with p < 0.001. As expected, residents had a lower mean age compared with the other groups, with p < 0.001. There was no statistically significant difference for the regional distribution of the participants (∆Table 2).

There were no differences (p > 0.05) regarding trigger finger diagnosis and classification options according to the practicing time of the participants (∆Table 3). Regarding nonsurgical treatment options and the practicing time of the orthopedist, differences in treatment duration were observed (p = 0.013). A treatment duration ranging from 1 to 3 months was the most commonly reported. However, a greater proportion of respondents with ≤ 5 years of experience (17.8%; n = 8) reported that the treatment lasted < 1 month compared with residents (7.1%; n = 7) and participants with > 5 years of experience (11.0%; n = 11). In addition, more residents stated that the treatment lasted for > 6 months (8.2%; n = 8) compared with participants with ≤ 5 years (0.0%; n = 0) or > 5 years (3.0%; n = 3) of experience.

Regarding surgical treatments according to the practicing time of the participants, there was a difference in open surgery in complications (p = 0.010) (∆Table 4). Surgical wound complications were the most frequently mentioned...
in all three groups. Persistent pain was reported by a higher number of residents (32.6%; n = 32) compared with professionals with ≤ 5 years (22.2%; n = 10) or > 5 years (21.0%; n = 21) of experience. In addition, triggering recurrence was more observed by orthopedists with > 5 years (16.0%; n = 16) of experience compared with residents (8.2%; n = 8) and professionals with ≤ 5 years (4.4%; n = 2) of clinical practice.

**Discussion**

The total sample consisted of 243 participants, with an average age of 37.46 years old. Most participants completed residence and had > 10 years of clinical practice. This number of respondents was higher compared to other Brazilian studies evaluating orthopedists.17–19 Okamura et al.18 evaluated trends in carpal tunnel syndrome planning, diagnosis and treatment by Brazilian surgeons and reported that 40% of orthopedists had been practicing for > 10 years.

Trigger finger was diagnosed due to locking observation during physical examination by 73.3% (n = 178) of the respondents; for 25.5% (n = 62) of the respondents, the diagnosis was based on physical examination and ultrasonography findings. These figures are consistent with the literature. Trigger finger is known for its classic presentation of snap and locking at the physical examination, which is typically sufficient for its diagnosis.10 As such, radiographs are not required for trigger finger diagnosis.20

Several classification systems have been proposed for trigger finger.1 In our study, the most used classifications are those by Green et al.21 and Quinnell et al.15 with no differences according to the practicing time of the orthopedist. These results agree with a systematic review from Fiorini et al.22
showing that most studies on trigger finger use the Quinnell classification for disease characterization.3,22 The initial treatment for trigger finger is conservative, including nonsteroidal anti-inflammatory drugs, immobilization, physical therapy and infiltrations.11,22,23 Physical therapy is a conservative treatment for trigger finger, but some authors question its success.24,25 Still, Salim et al.24 compared the efficacy of physical therapy and steroid injection in the treatment of mild trigger finger. At 3 months, the success rate of steroid injections and physical therapy was of 97.4% and 68.6%, respectively. However, after 6 months of treatment, only patients treated with steroids experience pain and recurrence.

The opinion of the respondents on infiltration is consistent with studies recommending steroid injections as the first line of treatment.11,22 The preference for steroid and anesthetic agent combinations for treatment was reported by 61.70% of respondents, especially in 1 or 2 applications. This conduct is consistent with the studies carried out by Clark et al.26 and Rhoades et al.27 showing that a single-dose treatment can result in a success rate ranging from 72 to 82%. In addition, Marks et al.28 reported an increased success rate of 91% after a second injection compared with the 84% success rate achieved with the first injection.

The divergence of the conduct of the respondents regarding nonsurgical treatment duration with their practicing time reflects the several approaches reported in the literature. The preferred treatment duration ranged from 1 to 3 months, and differed according to the practicing time of the orthopedist, with \( p = 0.013 \). A treatment duration of \(< 1 \) month was mostly reported by respondents with a practicing time \( \geq 5 \) years, whereas residents stated that treatment should last for at least 6 months. Some clinical studies in trigger finger adopt a 2- to 3-month follow-up,28,29 which is similar to our findings. In contrast, other studies reported treatment for \( > 6 \) months.3,30

Nonsurgical treatment had a success rate ranging from 30 to 60% for 46% of the respondents, and triggering recurrence was the most commonly reported complication. This success rate is inconsistent with a study from Sato et al.,2 who reported a cure rate of 57% of patients undergoing steroid injection, which increased to 86% with the second infiltration. Despite the good outcomes from steroids, this technique has important limitations, such as the recurrence rate of up to 48%; in addition, this data agrees with the conduct of the respondents.3,22

Surgical treatment of trigger finger can use either an open or percutaneous approach. Among surgical treatment options, the preference of the respondents for open transverse (51.02%) and open oblique (17.70%) procedures was highlighted. This finding is consistent with other studies that indicate open surgical release as the standard technique for trigger finger surgical treatment, with no consensus on the best access route.11,23

Outpatient-based hand surgery has stimulated the use of local anesthesia and sedation to reduce hospitalization costs and time.6,13,31,32 Our results are consistent with this approach. Respondents prefer sedation with local anesthetic agents (38.70%), which are considered a safe, quick, and effective option. However, its administration is painful and \( \sim 10\% \) of the patients prefer another form of anesthesia.31 Thus, additional sedation can render the procedure more comfortable. The use of a local anesthetic agent with a vasoconstrictor drug was rarely stated by respondents (7.8%; \( n = 19 \)), although it is known to be safe in hand surgeries.33 A Brazilian study evaluated the use of local anesthesia with lidocaine and epinephrine in wrist, hand and finger surgery, with no tourniquet, sedation or anesthetist and did not report any epinephrine-related complications.34

Surgical treatment for trigger finger has a reported success rate of up to 97%,3,22 Percutaneous surgery had 60 to 90%
### Table 3: Nonsurgical diagnosis and treatment of trigger finger according to the practicing time of the orthopedist

| Variable                                           | Practicing Time                  |  ≤ 5 years (n = 45) | > 5 years (n = 100) | p-value   |
|----------------------------------------------------|---------------------------------|---------------------|---------------------|-----------|
| **Diagnosis**                                      |                                  |                     |                     |           |
| Physical examination alone (locking)               | Resident (n = 98)                | 68 (69.4%)          | 34 (75.6%)          | 76 (76.0%)| 0.146**   |
| Physical examination and ultrasonography           |                                 | 30 (30.6%)          | 9 (20.0%)           | 23 (23.0%)|           |
| Physical examination and magnetic resonance imaging|                                 | 0 (0%)              | 2 (4.4%)            | 1 (1.0%)  |           |
| **Classification**                                 |                                  |                     |                     |           |
| Green                                              |                                 | 50 (51.0%)          | 28 (62.2%)          | 64 (64.0%)| 0.375*    |
| I do not use a classification system to treat      |                                 | 27 (27.6%)          | 10 (22.2%)          | 18 (18.0%)|           |
| Quinell                                            |                                 | 21 (21.4%)          | 7 (15.6%)           | 18 (18.0%)|           |
| **Initial treatment**                              |                                  |                     |                     |           |
| Physical therapy                                   |                                 | 43 (43.9%)          | 17 (37.8%)          | 53 (53.0%)| 0.672**   |
| A1 Pulley infiltration                             |                                 | 34 (34.7%)          | 17 (37.8%)          | 26 (26.0%)|           |
| Surgical treatment                                 |                                 | 9 (9.2%)            | 5 (11.1%)           | 7 (7.0%)  |           |
| NSAIDs, PO                                         |                                 | 7 (7.1%)            | 2 (4.4%)            | 5 (5.0%)  |           |
| Steroid, IM                                        |                                 | 2 (2.0%)            | 2 (4.4%)            | 5 (5.0%)  |           |
| Immobilization                                     |                                 | 2 (2.0%)            | 1 (2.2%)            | 4 (4.0%)  |           |
| Rest                                               |                                 | 1 (1.0%)            | 1 (2.2%)            | 0 (0%)    |           |
| **Drug used for infiltration**                     |                                  |                     |                     |           |
| Steroid with anesthetic agent                      |                                 | 62 (63.3%)          | 29 (64.4%)          | 59 (59.0%)| 0.626**   |
| I do not perform infiltrations                     |                                 | 21 (21.4%)          | 8 (17.8%)           | 20 (20.0%)|           |
| Steroids                                           |                                 | 15 (15.3%)          | 8 (17.8%)           | 19 (19.0%)|           |
| Hyaluronic acid                                    |                                 | 0 (0%)              | 0 (0%)              | 2 (2.0%)  |           |
| **Number of Infiltrations**                        |                                  |                     |                     |           |
| None                                               |                                 | 19 (19.4%)          | 10 (22.2%)          | 20 (20.0%)| 0.274**   |
| 1                                                  |                                 | 41 (41.8%)          | 10 (22.2%)          | 32 (32.0%)|           |
| 2                                                  |                                 | 34 (34.7%)          | 20 (44.5%)          | 43 (43.0%)|           |
| ≥ 3                                                |                                 | 4 (4.1%)            | 5 (11.1%)           | 5 (5.0%)  |           |
| **Treatment Duration**                             |                                  |                     |                     |           |
| < 1 month                                          |                                 | 7 (7.1%)            | 8 (17.8%)           | 11 (11.0%)| 0.013**   |
| 1-3 months                                         |                                 | 46 (46.9%)          | 29 (64.4%)          | 52 (52.0%)|           |
| 3-6 months                                         |                                 | 37 (37.8%)          | 8 (17.8%)           | 34 (34.0%)|           |
| > 6 months                                         |                                 | 8 (8.2%)            | 0 (0%)              | 3 (3.0%)  |           |
| **Nonsurgical Treatment Complications**            |                                  |                     |                     |           |
| Triggering recurrence                              |                                 | 55 (56.1%)          | 27 (60.0%)          | 58 (58.0%)|           |
| Persistent local pain                              |                                 | 27 (27.6%)          | 8 (17.8%)           | 21 (21.0%)| 0.805**   |
| Limited finger ROM                                 |                                 | 14 (14.3%)          | 9 (20.0%)           | 17 (17.0%)|           |
| Tendon rupture                                     |                                 | 2 (2.0%)            | 1 (2.2%)            | 4 (4.0%)  |           |
| **Nonsurgical Treatment Success Rate**             |                                  |                     |                     |           |
| 0-30%                                              |                                 | 25 (25.5%)          | 9 (20.0%)           | 30 (30.0%)| 0.616**   |
| 30-60%                                             |                                 | 47 (48.0%)          | 22 (48.9%)          | 43 (43.0%)|           |
| 60-90%                                             |                                 | 24 (24.5%)          | 11 (24.4%)          | 21 (21.0%)|           |
| > 90%                                              |                                 | 2 (2.0%)            | 3 (6.7%)            | 6 (6.0%)  |           |

Abbreviations: IM, Intramuscular route; NSAIDs: non-steroidal anti-inflammatory drugs; PO: oral route; ROM, range of motion. Healing complications include adhesions, hematoma, and infection. Fischer test** and chi-squared test*** were used, considering p <0.05 for statistically significant difference.
### Table 4 Surgical treatment for trigger finger according the practicing time of the orthopedist

| Variable                                                   | Practicing Time |        |        |        | p-value |
|------------------------------------------------------------|-----------------|--------|--------|--------|---------|
|                                                            | Resident (n = 98) | ≤ 5 years (n = 45) | > 5 years (n = 100) |        |
| **Anesthesia type**                                        |                 |        |        |        |         |
| Sedation with local anesthesia                            | 35 (35.7%)      | 17 (37.8%) | 42 (42.0%) | 0.953** |
| Limb regional block†                                       | 23 (23.5%)      | 12 (26.7%) | 21 (21.0%) |         |
| Local anesthetic agent with no vasoconstrictor drug       | 21 (21.4%)      | 9 (20.0%)  | 16 (16.0%) |         |
| Brachial plexus regional block                             | 10 (10.2%)      | 4 (8.9%)   | 8 (8.0%)   |         |
| Local anesthetic agent with vasoconstrictor drug          | 7 (7.2%)        | 3 (6.6%)   | 9 (9.0%)   |         |
| General anesthesia with laryngeal mask                     | 2 (2.0%)        | 0 (0%)     | 4 (4.0%)   |         |
| **Surgical Treatment**                                     |                 |        |        |        |         |
| Transversal open approach                                  | 48 (49.0%)      | 24 (53.3%) | 52 (52.0%) |         |
| Oblique open approach                                      | 22 (22.4%)      | 6 (13.3%)  | 15 (15.0%) |         |
| Percutaneous release                                       | 18 (18.4%)      | 7 (15.6%)  | 13 (13.0%) | 0.366*  |
| Longitudinal open approach                                 | 10 (10.2%)      | 8 (17.8%)  | 20 (20.0%) |         |
| **Percutaneous Surgery Complications**                    |                 |        |        |        |         |
| Triggering recurrence                                      | 44 (44.9%)      | 23 (51.1%) | 50 (50.0%) |         |
| Persistent local pain                                      | 20 (20.4%)      | 12 (26.8%) | 17 (17.0%) | 0.806** |
| I do not perform percutaneous surgery                      | 13 (13.2%)      | 5 (11.1%)  | 13 (13.0%) |         |
| Tendon rupture                                             | 8 (8.2%)        | 1 (2.2%)   | 11 (11.0%) |         |
| Operated finger ROM limitation                              | 5 (5.1%)        | 1 (2.2%)   | 2 (2.0%)   |         |
| Nerve injury                                               | 4 (4.1%)        | 1 (2.2%)   | 4 (4.0%)   |         |
| Surgical wound complications                               | 4 (4.1%)        | 2 (4.4%)   | 3 (3.0%)   |         |
| **Open Surgery Complications**                             |                 |        |        |        |         |
| Surgical wound complications                               | 49 (50.0%)      | 26 (57.8%) | 55 (55.0%) | 0.010** |
| Persistent local pain                                      | 32 (32.6%)      | 10 (22.2%) | 21 (21.0%) |         |
| Operated finger ROM limitation                              | 8 (8.2%)        | 7 (15.6%)  | 3 (3.0%)   |         |
| Triggering recurrence                                      | 8 (8.2%)        | 2 (4.4%)   | 16 (16.0%) |         |
| Nerve injury                                               | 1 (1.0%)        | 0 (0%)     | 5 (5.0%)   |         |
| **Percutaneous Surgery Success**                           |                 |        |        |        |         |
| 0-30%                                                      | 8 (8.2%)        | 3 (6.7%)   | 4 (4.0%)   | 0.858*  |
| 30-60%                                                     | 18 (18.4%)      | 9 (20.0%)  | 20 (20.0%) |         |
| 60-90%                                                     | 46 (46.9%)      | 17 (37.8%) | 41 (41.0%) |         |
| > 90%                                                      | 14 (14.3%)      | 10 (22.2%) | 20 (20.0%) |         |
| I do not perform percutaneous surgery                      | 12 (12.2%)      | 6 (13.3%)  | 15 (15.0%) |         |
| **Open Surgery Success**                                   |                 |        |        |        |         |
| 0-30%                                                      | 0 (0%)          | 0 (0%)    | 1 (1%)    | 0.513*  |
| 30-60%                                                     | 4 (4.1%)        | 2 (4.4%)  | 1 (1.0%)  |         |
| 60-90%                                                     | 34 (34.7%)      | 12 (26.7%) | 35 (35.0%) |         |
| > 90%                                                      | 60 (61.2%)      | 31 (68.9%) | 63 (63.0%) |         |

Abbreviation: ROM, Range of motion.
Surgical wound complications include adhesions, hematoma, and infection; regional limb block refers to an intravenous Bier block. Fischer test** and chi-squared test*** were used, considering p < 0.05 for statistically significant difference.
of success for 43.0% of respondents, and its most common complication was triggering recurrence. In contrast, open surgery had a success rate >90% for 63% of respondents. Regarding percutaneous surgery, the findings are not consistent with the literature, which shows that open and percutaneous procedures had similar efficacy, >90%.3

Surgical wound intercurrences were the most reported complications of open surgery; however, there was a difference according to clinical practicing time, with \( p = 0.010 \). Persistent pain was more observed by residents, while trigger recurrence was more reported by professionals with >5 years of clinical practice. Outcomes from open release of the A1 pulley are usually excellent,11 with high success rates and minimal recurrence. Despite this, there are reports of complications, such as painful scars, infection, nerve damage and recurrence.3,35

**Conclusion**

When performing the therapeutic plan for trigger finger, Brazilian orthopedists establish the diagnosis with physical examination alone, use the Quinell classification modified by Green, and initially institute a nonsurgical treatment for 1 to 3 months, consisting of infiltrations with steroids and local anesthetic agents; in case of failure, they opt for surgical treatment using an open transverse approach, which is successful in >90% of patients. The main nonsurgical complications were triggering recurrences, and the main surgical complications were healing intercurrences.

**Conflict of Interests**

The authors have no conflict of interests to declare.

**References**

1. Yang TH, Chen HC, Liu YC, et al. Clinical and pathological correlates of severity classifications in trigger fingers based on computer-aided image analysis. Biomed Eng Online 2014;13(01):100
2. Clapham PJ, Chung KC. A historical perspective of the Notta’s node in trigger fingers. J Hand Surg Am 2009;34(08):1518–1522
3. Sato ES, Gomes Dos Santos JB, Belloti JC, Albertoni WM, Faloppa F. Treatment of trigger finger: randomized clinical trial comparing the methods of corticosteroid injection, percutaneous release and open surgery. Rheumatology (Oxford) 2012;51(01):93–99
4. Saldana MJ. Trigger digits: diagnosis and treatment. J Am Acad Orthop Surg 2001;9(09):246–252
5. Marij Z, Auranzegb Q, Rizwan HR, Haroon R, Pervaiz MH. Outpatient Percutaneous Release of Trigger Finger: A Cost Effective and Safe Procedure. Malays Orthop J 2017;11(01):52–56
6. de Freitas Novais Junior RA, Bacelar Costa JR, de Morais Carmo JM. Use of adrenaline with lidocaine in hand surgery. Rev Bras Ortop 2014;49(05):452–460
7. Freiberg A, Mulholand RS, Levine R. Nonoperative treatment of trigger fingers and thumbs. J Hand Surg Am 1989;14(03):553–558
8. Giordano M, Giordano V, Giordano J. Tratamento do dedo em galatilho pela injecao local de corticoesteroides. Rev Bras Ortop 1997;32(12):971–974
9. Kameyama M, Meguro S, Funae O, Atsumi Y, Ikegami H. The presence of limited joint mobility is significantly associated with multiple digit involvement by stenosing flexor tenosynovitis in diabetics. J Rheumatol 2009;36(08):1686–1690
10. Makkouk AH, Oetgen ME, Swigart CR, Dodds SD. Trigger finger: etiology, evaluation, and treatment. Curr Rev Musculoskelet Med 2008;1(02):92–96
11. Wang J, Zhao JC, Liang CC. Percutaneous release, open surgery, or corticosteroid injection, which is the best treatment method for trigger digits? Clin Orthop Relat Res 2013;471(06):1879–1886
12. Sato ES, dos Santos JB, Belloti JC, Albertoni WM, Faloppa F. Percutaneous release of trigger fingers. Hand Clin 2014;30(01):39–45
13. Mehlmann FM, Ferraro LH, Sousa PC, Cunha GP, Bergamaschi EC, Takeda A. Bloqueios seletivos guiados por ultrassom para cirurgias de dedo em galatilho para manutenção da flexão/extensão dos dedos – Série de casos. Braz J Anesthesiol 2019;69(01):104–108
14. Liu DH, Tsai MW, Lin SH, et al. Ultrasound-Guided Hylauronic Acid Injections for Trigger Finger: A Double-Blinded, Randomized Controlled Trial. Arch Phys Med Rehabil 2015;96(12):2120–2127
15. Quinell RC. Conservative management of trigger finger. Practitioner 1980;224(1340):187–190
16. Eastwood DM, Gupta KJ, Johnson DP. Percutaneous release of the trigger finger: an office procedure. J Hand Surg Am 1992;17(01):114–117
17. Alves PL, Ueta FTS, Ueta RHS, et al. Perfil do cirurgiao de coluna brasileiro. Coluna/Columina 2013;12(03):218–223
18. Okamur A, Guidetti BC, Caseili R, Borracini JA, Moraes VY, Belloti JC. How Do Board-Certified Hand Surgeons Manage Carpal Tunnel Syndrome? a National Survey. Acta Ortop Bras 2018;26(01):48–53
19. Matsumoto MK, Fernandes M, de Moraes VY, Raduan J, Okamura A, Belloti JC. Treatment of Finger Tip Injuries By Specialists in Hand Surgery in Brazil. Acta Ortop Bras 2018;26(05):294–299
20. Katzman BM, Steinberg DR, Bozentka DJ, Cain E, Caligiuri DAG, Geller J. Utility of obtaining radiographs in patients with trigger finger. Am J Orthop 1999;28(12):703–705
21. Wolfe SW. Tenosynovitis. In: Green DP, Hotchkiss RN, Pederson WC, Wolfe SW, eds. Green's Operative Hand Surgery. Philadelphia: Elsevier; 2005:2137–2158
22. Fiorini HJ, Tamaoki MJ, Lenza M, Gomes dos Santos JB, Faloppa F, Belloti JC. Surgery for trigger finger (Review) Summary of Findings for the main Comparison. Cochrane Database Syst Rev 2018;(02):1–9
23. Marks MR, Gunther SE. Efficacy of cortisone injection in treatment of trigger fingers and thumbs. J Hand Surg Am 1989;14(04):722–727
24. Salim N, Abdullah S, Sapuan J, Haliah NHM. Outcome of corticosteroid injection versus physiotherapy in the treatment of mild trigger fingers. J Hand Surg Eur Vol 2012;37(01):27–34
25. Yildirim P, Gultekin A, Yildirim A, Karahan AY, Tok F. Extracorporeal shock wave therapy versus corticosteroid injection in the treatment of trigger finger: a randomized controlled study. J Hand Surg Eur Vol 2016;41(09):977–983
26. Clark DD, Ricker JV, MacCollum MS. The efficacy of local steroid injection in the treatment of stenosing tenovaginitis. Plast Reconstr Surg 1973;51(02):179–180
27. Rhoades CE, Gelberman RH, Manjarris JF. Stenosing tenosynovitis of the fingers and thumb. Results of a prospective trial of steroid injection and splinting. Clin Orthop Relat Res 1984(190):236–238
28. Diers K, Hoffmann R, Meek MF. Open versus percutaneous release of the A1-pulley for stenosing tendovaginitis: a prospective randomized trial. Tech Hand Up Extrem Surg 2008;12(03):183–187
29. Nikolaou VS, Mahalais MA, Kasetta MK, Sourlas I, Babis GC. Comparative clinical study of ultrasound-guided A1 pulley release vs open surgical intervention in the treatment of trigger finger. World J Orthop 2017;8(02):163–169
30. Zyluk A, Jagielski G. Percutaneous A1 pulley release vs steroid injection for trigger digit: the results of a prospective, randomized trial. J Hand Surg Eur Vol 2011;36(01):53–56
31. Koegst WHH, Wollfe O, Thoele K, Sauerbier M. [The “Wide Awake Approach” in hand surgery: a comfortable anaesthesia method without a tourniquet]. Handchir Mikrochir Plast Chir 2011;43(03):175–180
32. Cohen TJ. Tratamento percutaneo do dedo am galatilho. Rev Bras Ortop 1996;31(08):690–692
Annex 1 QUESTIONNAIRE OFF DIAGNOSIS AND TREATMENT OF TRIGGER FINGER

NAME: ____________________________ ____________________________

AGE: ________ years

What is your speciality?
( ) Resident Orthopedics ( ) Resident hand surgery
( ) ORTHOPEDICIST / SPECIALTY: __________

How long have you been in your specialty?
a) I am a resident
b) up to 1 year
c) 1-5 years
d) 5-10 years
e) more than 10 years

1) What is the region in which you work?
   a) south
   b) southeast
   c) north
   d) northeast
   e) Midwest

2) How do you diagnose a trigger finger?
   a) Physical examination only (crash)
   b) Physical examination and ultrasound
   c) Physical examination and MRI
   d) Other (specify) ______________

3) What classification do you use to plan the treatment of the trigger finger?
   a) Quinel
   b) Green
   c) other (specify) ______________
   d) do not use classification
to treat

4) What is your preference for initial trigger finger treatment (only 1 option)?
   a) physiotherapy
   b) immobilization
   c) VO NSAIDs
   d) rest
   e) IM corticoid
   f) infiltration of the A1 pulley
   g) surgical treatment

5) When infiltration is indicated, which substance do you prefer (only 1 option)?
   a) Corticoid
   b) Corticoid + anesthetic
   c) Anesthetic
   d) Hyaluronic acid

6) How many infiltrations do you perform on the trigger finger before considering treatment failure?
   a) none (do not infiltrate)
   b) 1
   c) 2
   d) 3 or more

7) How long do you treat the trigger finger until you indicate surgical treatment?
   a) <1 month
   b) 1-3 months
   c) 3-6 months
   d) >6 months

8) In the indication of surgical treatment, which type of anesthesia is your preference?
   a) General anesthesia with laryngeal mask
   b) Sedation + local anesthetic
   c) Local anesthetic without vasoconstrictor
   d) Local anesthetic with vasoconstrictor
   e) Regional limb block () venous bier () brachial plexus block

9) In the indication of surgical treatment, what is your preference?
   a) percutaneous release
   b) transverse open path
   c) oblique open road
   d) longitudinal open path

10) What is your main complication in non-surgical treatment?
   a) relapse of the triggering
   b) persistent local pain
   c) complications of the surgical incision (adhesion, hematoma, infection)
   d) ADM limitation of the operated finger
   e) nerve damage
   f) tendon rupture
   g) I don’t do percutaneous surgery

11) What is your main complication in percutaneous surgery?
   a) relapse of the triggering
   b) persistent local pain
   c) complications of the surgical incision (adhesion, hematoma, infection)
   d) ADM limitation of the operated finger

12) What is your main complication in open surgery?
   a) relapse of the triggering
   b) persistent local pain
   c) complications of the surgical incision (adhesion, hematoma, infection)
   d) ADM limitation of the operated finger
13) In your experience, what is the percentage of success with non-surgical treatment?
   a) 0-30%
   b) 30-60%
   c) 60-90%
   d) >90%
   e) I don't do percutaneous surgery

14) In your experience, what is the percentage of success with percutaneous surgical treatment?
   a) 0-30%
   b) 30-60%
   c) 60-90%
   d) >90%

15) In your experience, what is the percentage of success with open surgical treatment?
   a) 0-30%
   b) 30-60%
   c) 60-90%
   d) >90%