

# Trigger finger: An overview of the treatment options

Amber Matthews, PA-C, MPAM; Kristen Smith, PA-C, MPAM;  
Laura Read, PA-C; Joyce Nicholas, PhD; Eric Schmidt, PhD

## ABSTRACT

Stenosing flexor tenosynovitis, more commonly known as *trigger finger*, is one of the most common causes of hand pain and dysfunction. Clinicians must be able to identify the disorder, know the broad range of treatment options, and counsel patients on the treatment best suited for their condition. Awareness of the economic burden each option entails is central to optimizing treatment outcomes and patient satisfaction.

**Keywords:** trigger finger, stenosing flexor tenosynovitis, A1 pulley, audible snap, flexion contracture, flexor tendon nodule

## Learning objectives

- Describe the typical presentation of a patient with trigger finger.
- List the commonly used treatments to manage symptoms of trigger finger.
- Describe the economic effect of the various treatment options with regards to therapeutic decision-making.

A 53-year-old woman presents to her primary care provider with a 1-week history of pain and tenderness at the base of her right ring finger that has worsened in the past 2 days. She describes the pain as a cramping sensation that radiates from her ring finger to her palm and occurs with flexion and extension of the digit. When the symptoms started 1 week ago, she only experienced a painless clicking when bending her fingers. But over the past 2 days, her finger has locked in the bent position, forcing her to use her other hand to straighten it. The patient says that her symptoms seem to be worse in the morning and get progressively better throughout the day. She denies any recent trauma to the affected finger and has never encountered similar symptoms in the past. She took 400 mg of ibuprofen twice a day for the past 2 days with no relief of symptoms.

The patient's fourth digit appears nonerythematous with no swelling or warmth. She exhibits tenderness to palpation just proximal to the metacarpophalangeal flexion crease of the fourth digit. A tender nodule also is present in this area. The patient is able to make a tight fist with



At the time this article was written, **Amber Matthews** and **Kristen Smith** were students in the PA program at the University of Lynchburg in Lynchburg, Va. Ms. Matthews now practices pediatrics at Blue Ridge Medical Center in Arrington, Va. Ms. Smith now practices critical care at Central Lynchburg General Hospital. **Laura Read** is director of didactic education in the PA program at the University of Lynchburg. **Joyce Nicholas** is director of evaluation, assessment, and compliance in the PA program at the University of Lynchburg. **Eric Schmidt** is an assistant professor at the University of Lynchburg. The authors have disclosed no potential conflicts of interest, financial or otherwise.

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### Key points

- Trigger finger is a common cause of hand pain and dysfunction with a bimodal distribution in patients under age 8 years and those ages 40 to 60 years.
- No universally accepted tool exists for classifying or treating trigger finger.
- Surgery is typically indicated for patients who continue to experience pain and locking after treatment with conservative measures and corticosteroid injections.
- Trigger finger is more common in patients with diabetes and related disorders such as carpal tunnel syndrome and limited joint mobility.

her right hand but the ring finger remains in the flexed position when she is asked to extend her fingers. An audible snap is appreciated when the finger is passively extended using the contralateral hand.

### ABOUT TRIGGER FINGER

The patient has a classic presentation of stenosing flexor tenosynovitis, commonly known as trigger finger. This condition is one of the most common causes of hand pain in adults, affecting women six times more frequently than men. It is most common in patients ages 40 to 60 years, and often is found in the dominant hand, especially the fourth digit.<sup>1</sup> Lifetime prevalence of trigger finger is 2% to 3% in the general population, and up to 10% in patients with diabetes.<sup>2</sup> In children, the condition is most common in those under age 8 years, affects boys and girls equally, and is more common in the thumb.<sup>3</sup>

Trigger finger is thought to be idiopathic, although there is a correlation with repetitive use of the affected hand as well as history of diabetes, particularly type 1 diabetes.<sup>2,4</sup> Although no studies indicate the specificity or sensitivity of trigger finger as a diagnostic predictor of diabetes, multiple trigger digits are more common in patients with diabetes. Consider screening patients for diabetes if they have no known history of diabetes and multiple trigger digits.<sup>4</sup>

Other disorders of the upper extremities that are more common in patients with diabetes include carpal tunnel syndrome, adhesive capsulitis of the shoulder, limited joint mobility, and Dupuytren contracture.<sup>5</sup> These conditions seem to be related to poor glycemic control.<sup>6</sup> The role of diabetes in predisposing patients to these upper extremity conditions is thought to be an indicator of microvascular complications of the disease.<sup>5</sup>

When patients flex a finger, the flexor tendon passes through a series of sheaths called annular and cruciform pulleys (Figure 1). These sheaths encapsulate the tendon, preventing it from separating from the bone when the finger is flexed, and letting the tendon glide smoothly back and forth during flexion and extension.<sup>1</sup> Trauma such as repetitive use or compression forces can cause tendon

hypertrophy and sheath narrowing that prevent the tendon from sliding smoothly in the sheath and result in a catching or locking sensation.<sup>3</sup> Because the greatest degree of force occurs at the first annular (A1) sheath overlying the proximal interphalangeal joint, this sheath is the one most commonly affected in patients with trigger finger.<sup>1</sup> Chuang and colleagues examined cadaver digits and found that when the finger flexes, the flexor tendon diameter increases as the tendon moves proximally through the sheaths. This would explain why tendon hypertrophy makes trigger fingers progressively difficult to extend.<sup>7</sup>

In children, however, most research indicates that trigger thumb is caused by a developmental size mismatch in the diameter of the flexor pollicis longus (FPL) tendon and its annular sheath.<sup>8</sup> Why this anomaly occurs remains unclear. Through a study of serial ultrasounds, Verma and colleagues reinforced the idea that pediatric trigger thumb is a developmental condition. All 56 trigger thumbs demonstrated focal enlargement of the FPL without evidence of inflammation or trauma.<sup>9</sup> This is in contrast to the pathophysiology of trigger finger in adults. Alternatively, trigger finger in a child is 10 times less likely to be seen than trigger thumb.<sup>8</sup> Studies propose that a trigger digit other than the thumb in a child may suggest an underlying pathology, such as an inflammation or infection.<sup>8</sup>

### DIAGNOSIS

**Role of ultrasound** The diagnosis of trigger finger is made clinically based on the patient's presenting symptoms and physical examination. However, ultrasound is increasingly being used to aid in diagnosis. Using ultrasound to measure the thickening of the affected sheath compared with unaffected sheaths on the same hand has been shown to be as accurate as direct measurements during surgery.<sup>10</sup> The degree of thickening seen on ultrasound is correlated with symptom severity.<sup>11</sup>

**Grading** Although no universal grading system exists for trigger finger, several similar models have been proposed.<sup>12</sup> None of these models have been accepted as the gold standard but they can be used to assess severity and assist in selecting the appropriate referral and treatment options.

**FIGURE 1.** Lateral depiction of the fourth digit

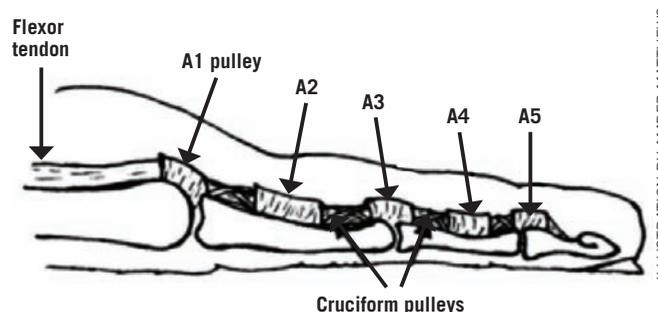


ILLUSTRATION BY AMBER MATTHEWS

The grading system in **Table 1**, developed by Quinnell and modified by Green, has been used in many trigger finger studies.<sup>12</sup>

**Differential diagnosis** Conditions that can lead to locking, pain, loss of motion, and swelling of the metacarpophalangeal joints include a fracture or dislocation. In many instances, clinicians misjudge the flexor tendon nodule for a bony mass.<sup>8</sup> With a quick history and physical examination, a fracture can be easily ruled out, especially if the patient has no history of trauma.

In adults with pain and a locking sensation of a digit, the differential diagnosis includes Dupuytren contracture, diabetic cheiroarthropathy, metacarpophalangeal joint sprain, calcific peritendinitis, noninfectious tenosynovitis, infectious tenosynovitis, rheumatoid arthritis, osteoarthritis, and crystalline arthropathy (**Table 2**).<sup>13,14</sup>

In children, trigger thumb sometimes can be confused with a far-reaching diagnosis of cerebral palsy or arthrogryposis.<sup>15</sup> The deformities caused by cerebral palsy and arthrogryposis are believed to be caused by inappropriate differentiation of connective tissues in the hand.<sup>8</sup> Although these disorders have a similar presentation to trigger finger, their developmental cause and features are very different. Children with cerebral palsy and arthrogryposis are easily differentiated from those with trigger finger by other abnormalities beyond the digits of the hand.

## TREATMENT

Treatments for trigger finger range from conservative to invasive.

**Noninvasive options** Initial management of mild-to-moderate trigger finger symptoms may consist of a combination of nonsteroidal anti-inflammatory agents (NSAIDs), massage, heat, and/or ice. Splinting the digit in an extended position also can help rest the tendon and let the inflamed sheath heal.<sup>16</sup> Exercises and passive stretches have been attempted in many patients but no research supports a clinically proven or widely accepted exercise model. Passive stretching and splinting are more commonly used in children to avoid surgical management.<sup>8</sup>

**Corticosteroid injections** If conservative management fails, the first-line treatment is corticosteroid injections directly into the inflamed tendon sheath.<sup>17</sup> For many patients, a single injection provides relief for up to 10 years.<sup>18</sup> A second and occasionally third corticosteroid injection may be given 4 to 6 months apart, but typically the case is considered refractory and referred for surgical management after two to three unsuccessful treatment attempts. Adverse reactions to corticosteroid injections are rare but include fat necrosis or pigment changes at the injection site, infection, and tendon rupture.<sup>17</sup>

**Extracorporeal shock wave therapy (ESWT)** A newer alternative to corticosteroid injections, ESWT is as effective in symptom management.<sup>19</sup> This noninvasive therapy has been used for years for various other soft-tissue

**TABLE 1.** Clinical classification of trigger finger

<b>Grade I;</b> Pretriggering	Pain and history of catching, but not demonstrable on physical examination. Tenderness over A1 pulley.
<b>Grade II;</b> Active	Demonstrable catching, but the patient can actively extend the digit.
<b>Grade III;</b> Passive	Demonstrable catching requiring passive extension (Grade IIIA) or inability to actively flex (Grade IIIB).
<b>Grade III;</b> Contracture	Demonstrable catching with a fixed flexion contracture of the proximal interphalangeal joint.

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pathologies such as tennis elbow and plantar fasciitis but is just beginning to be studied in patients with trigger finger. After transducer gel is applied to the patient's skin above the affected tendon, a probe is placed to deliver a shock wave. The mechanism of this therapy is not completely understood but ESWT may cause inflammation and stimulate the body's natural healing processes.<sup>20</sup> ESWT is an option for patients who do not wish to undergo injections or surgery.

**Surgery** Surgical options include open surgical release and percutaneous release of the A1 sheath. Open surgical release traditionally is used as first-line treatment in children, especially those with congenital trigger thumb. Conservative management can be attempted in children but is historically unsuccessful.<sup>8</sup> In adults, surgery is typically reserved for patients with severe trigger finger that has failed conservative management. Although open surgical release has been practiced longer, no significant disparity in failure rate or number of complications exists between it and percutaneous release.<sup>21</sup> Risks of both types of surgery include nerve injury and incomplete release, and neither is widely accepted as superior at this time. Patients may prefer percutaneous release because it is less invasive; surgeons may prefer open surgery because of better visibility of the surgical field.<sup>21</sup>

Endoscopic release techniques, which improve visualization for surgeons and reduce scarring and healing time for patients, have been attempted.<sup>22</sup> Endoscopy also reduces the risk of nerve or tendon injury. However, this approach requires surgeons to master a new technique and facilities to obtain more sophisticated, costly instruments.<sup>22</sup>

**TABLE 2.** Differential diagnosis for trigger finger<sup>13, 14</sup>

<b>Dupuytren contracture</b>	A painless nodular lesion in the palmar fascia that progresses over time to form a fibrous cord extending from palm to digit.
<b>Diabetic cheiroarthropathy</b>	Limited ability to fully extend the metacarpophalangeal joints and interphalangeal joint.
<b>Metacarpophalangeal joint sprain</b>	Suspect this if the patient has a history of trauma and absence of triggering.
<b>Calcific peritendinitis</b>	Characterized by significant pain and erythema so severe it may stimulate infection. Fluffy calcification on radiograph.
<b>Noninfectious tenosynovitis</b>	Characterized by swelling and pain along the long axis of affected tendon or joints of finger.
<b>Infectious tenosynovitis</b>	Characterized by severe pain, erythema, and swelling along the long axis of affected tendon or joints of finger, particularly following a puncture or bite wound.
<b>Rheumatoid arthritis</b>	Characterized by joint pain, tenderness, swelling, or stiffness lasting 6 weeks or longer. Typically polyarticular, affecting small joints symmetrically and bilaterally. Boutonniere and Swan-neck deformities of the distal interphalangeal joint and proximal interphalangeal joint joints may be present. Metacarpophalangeal joints may exhibit ulnar deviation. Also can affect organs and body systems as well.
<b>Osteoarthritis</b>	Characterized by swelling, tenderness, and erythema particularly first thing in the morning, and after resting or extended activity. Gradual symptom onset typically involving multiple joints. Heberden nodes on the distal interphalangeal joint joint and Bouchard nodes on the proximal interphalangeal joint joint may be present. Bone spurs may be evident on radiograph.
<b>Crystalline arthropathy</b>	Characterized by episodes or attacks that last for days to weeks. Joint may be hot, erythematous, swollen, stiff, and exquisitely tender. Fever can accompany an acute attack. Joint aspiration reveals negative birefringence (gout) or positive birefringence (pseudogout).

## COSTS OF TREATMENT

Trigger finger is a common issue with a variety of acceptable treatments. Clinicians should include the cost of each option when discussing treatment with patients. A patient's comorbidities play a role in which treatment option is most cost effective. Luther and colleagues compared four different treatment strategies for trigger finger in patients with diabetes: one corticosteroid injection followed by surgical release, two corticosteroid injections followed by surgical release, immediate surgical release in an OR, and immediate surgical release in a clinic.<sup>23</sup> They found that immediate surgical release in the clinic was the least costly treatment for patients with diabetes.<sup>23</sup> Corticosteroid injections are less efficacious in patients with diabetes, who often need surgery even after injections. In addition, corticosteroid injections can increase blood glucose levels in patients with diabetes.

A cost analysis study by Kerrigan and colleagues found that the most cost-effective treatment for trigger finger in the general population is a corticosteroid injection followed by a second injection for failures or recurrence, followed by definitive surgery, if needed.<sup>24</sup> For one or two corticosteroid injections to be the most cost-effective strategy in patients with diabetes, injection failure rates would need to be less than 36% and 34%, respectively.<sup>23</sup>

## CONCLUSION

Trigger finger is one of the most common diagnoses of hand pain in adults. Nearly all patients complain of some level of discomfort and locking of a digit that is worse in the morning or after repetitive use of their hands throughout the day. Studies suggest that the best and most cost-effective treatment is immediate surgical release in the clinic (for patients with diabetes) and one to two corticosteroid injections, followed by definitive surgery, if needed (for patients without diabetes).<sup>23,24</sup> Although this is not the standard of care, cost and patient comorbidities should be included in therapeutic decision-making when treating patients with trigger finger. **JAAPA**

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