

## TRIGGER DIGITS

**Definition:** This problem generally is caused by a size mismatch between the flexor tendon and the first annular (A-1) pulley.

### Abstract

Primary stenosing tenosynovitis is usually idiopathic and occurs more frequently in middle-aged women than in men, but can be seen even in infancy.

Secondary stenosing tenosynovitis of the digits can occur in patients with rheumatoid arthritis, diabetes mellitus, gout, and other disease entities that cause connective tissue disorders.

85% of triggering fingers and thumbs can be treated successfully with corticosteroid injections and nonsteroidal anti-inflammatory drugs.

Surgical release is generally indicated when nonoperative treatment fails. Percutaneous or open release of A1 pulley is required.

### Clinical features

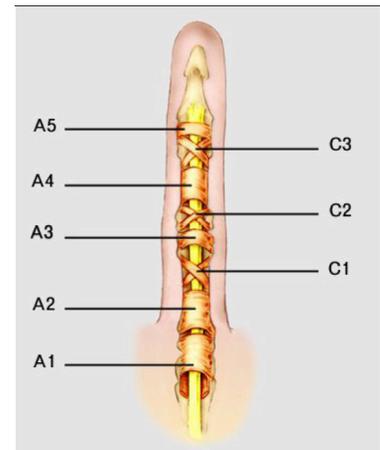
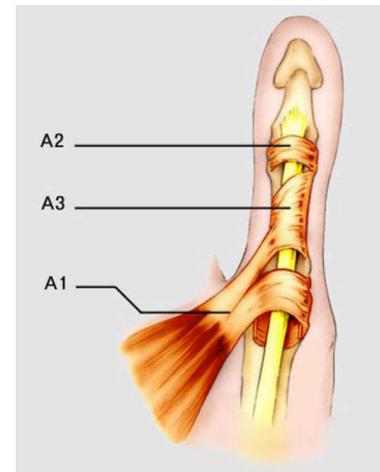
Trigger fingers and thumbs are characterized by the inability to flex or extend the digit smoothly.

The ring finger is most often involved, followed by the thumb and the long, index, and small fingers, in that order [The most commonly affected digits were the ring (42%) and middle (26%) fingers].

More than one trigger digit can be present on the same hand.

Most patients describe triggering as a painful snapping, which often makes them reluctant to make a full fist.

Triggering may lock in flexion sometimes.



## **Pathology**

2 types : nodular and diffuse.

This classification is based on the findings on palpation of the swelling of the tendon sheath. If the swelling is contained so that there is a definite nodule that moves back and forth under the examiner's finger as the digit triggers, the inflammation is considered nodular. If the swelling is instead more diffuse and less defined, the condition is considered diffuse. Nodular trigger digits will respond much more favorably to corticosteroid injection.

The duration of symptoms is an important factor in the treatment outcome. If the condition has been present for more than 6 months, it will be less likely to respond to nonoperative management.

## **Pathophysiology**

The proximal ends of the A1 pulleys are fulcrums. Considerable angulation of the flexor tendons occurs at the proximal edge of the A1 pulley during forceful flexion of the digits.

Stenosing tenosynovitis is a pathologic disproportion between the volume of the retinacular sheath and its contents. This disproportion inhibits gliding as the tendon moves through the A1 pulley. Inflammation manifests itself as a spindle-shaped thickening in a localized area of the flexor tendon. In nodular stenosing tenosynovitis, this occurs just distal to the A1 pulley, where tendon friction deforms the tendon and causes a nodule to form. In diffuse stenosing tenosynovitis, the inflammation will not be as localized and may well extend beyond the A1 pulley. With secondary inflammation, such as that due to rheumatoid arthritis, treating the underlying disease can sometimes restore the normal relationship between the retinacular sheath and its contents.

The normal A1 pulley has two layers: a vascular outer layer and a collagenous inner layer that extends to the gliding surface, where most of the friction between the tendon and the pulley occurs. The gliding layer has been shown to contain a biphasic population of spindle-shaped fibroblasts and ovoid cells. Here A1 pulleys, the gliding layer hypertrophies, the ovoid cells increase in number & have the appearance of chondrocytes.

The pathologic changes in children with trigger digits are quite different from those in adults. Triggering generally occurs early in life, and parents note that the thumbs are flexed at the terminal phalanx. There is usually a mass palpable on the palmar aspect of the MCP joint. The thumb can be actively and passively flexed at the MCP joint, but there is a block to full extension at 10 to 20 degrees. Nonoperative modalities have not been successful in infants and children because most present with long-standing trigger digits. The most common findings at surgery are nodules on the FPL without hypertrophy of the A1 pulley.

### **Diagnosis**

Triggering digits are more common in women than in men.<sup>1</sup> The presentation varies widely. Initially, the triggering may not be painful. The patient may feel a mild click in the finger or may report inability to fully flex the finger. As the stenosing tenosynovitis becomes more severe, there is distinct discomfort on the palmar side of the MCP joint, with pain frequently radiating into the forearm. When triggering occurs, it is not uncommon for the patient to perceive the snapping as occurring at the proximal interphalangeal (PIP) joint. Mild triggering is more apt to be present in the early morning and becomes less bothersome as the fingers and hand are used throughout the day. This phenomenon of improvement does not occur if the stenosing tenosynovitis is more severe and locking occurs.

A careful history and a thorough physical examination are important parts of the evaluation. Medical conditions such as rheumatoid arthritis, diabetes, gout, carpal tunnel syndrome, de Quervain's tenosynovitis, Dupuytren's contracture, and hypertension may be associated with the occurrence of triggering.<sup>7</sup> Tumors of the tendons, foreign bodies, and exostoses have also been implicated.

On physical examination, pain at the palmar base of the involved digit associated with crepitus on palpation is indicative of early tenosynovitis. Once deformation of the tendon has occurred, "catching" of the digit will be manifested as the patient tries to extend the fingers from a fist position. More severe stenosing tenosynovitis will lock the finger or thumb in flexion, requiring the patient or examiner to push the finger into extension;

there will be noticeable “give” on unlocking. The patient will not be able to fully extend a finger at the distal interphalangeal (DIP) joint or an involved thumb. At the initial examination, it should be determined whether the swelling is diffuse or nodular.

### **Classification**

Quinnell’s classifications

Grade 1, uneven movement of the digit

Grade 2, clicking without locking

Grade 3, locking of the digit that is either actively or passively correctable

Grade 4, a locked digit.

### **Nonsurgical Treatment.**

1. In some cases: Repetitive trauma to the hands, such as may occur in gardening, sewing, cutting with scissors, cake decorating, and bongo playing, may be the cause of the initial trauma to the fingers. If these activities are modified or avoided, spontaneous resolution of tenosynovitis can occur.

2. In most cases, no causative element can be identified.

NSIDs, use prefabricated splints

**Corticosteroid Injection:** The response has varied from 42% to as high as 92% with as many as three injections. Early nodular trigger digit can be treated with an injection into the tendon sheath x 3 injections and results are good.

Diffuse stenosing tenosynovitis should be treated with only one steroid injection if symptoms have been present for longer than 4 months or persist after the initial injection, surgical release is appropriate without further nonoperative treatment.

### **Surgical Treatment**

Surgical release of the A1 pulley can be done through either a transverse or a longitudinal incision in the palm.

It is important to protect the neurovascular bundles on both the medial and the lateral side. Local anesthesia is preferable because it allows active flexion and extension on the operating table, and the completeness of the release can be confirmed.

Open release of the A1 pulley is the traditional form of surgical treatment. However, percutaneous release has been advocated.

Surgical release of the A1 pulley is done with local anesthesia and tourniquet control. A transverse incision in the distal palmar crease can be used. The neurovascular bundles on either side should be identified and protected. The A1 pulley release is performed, and the patient is asked to flex and extend the digit intraoperatively. If triggering is still occurring, the release should be checked for completeness; further release of the A1 pulley may be warranted. In secondary triggering, a synovectomy is required in addition.

### **Complications**

1. Digital nerve transection
2. A2 pulley injury with subsequent bowstringing of the tendons
3. Bothersome scars, recurrent symptoms, stiffness, and sympathetic dystrophy: 28%.
4. Persistence of triggering due to incomplete release
5. In diabetic patients trigger finger often is less responsive to conservative measures.
6. proximal interphalangeal joint arthrofibrosis that required cast application for pain relief. The major complication rate was 3%

### **References**

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