

Pediatric Trigger Digits

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Learning Objectives

- Discuss etiology, clinical picture, and diagnosis of congenital trigger thumbs.
- Discuss etiology, clinical picture, and diagnosis of congenital trigger fingers.
- List treatment options and outcomes of congenital trigger thumbs.
- List treatment options and outcomes of congenital trigger fingers.
- Highlight the similarities and differences in pathology presentation and treatment between congenital trigger thumbs and fingers.

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Pediatric trigger thumb presents not at birth but early in childhood. Most evidence suggests that it is caused by a developmental size mismatch between the flexor pollicis longus tendon and its sheath. Patients generally present with the thumb interphalangeal joint locked in flexion. Surgical reviews report near universally excellent outcomes after open release of the A1 pulley. However, recent reports indicate that there may be a role for nonsurgical treatment for families that are willing to wait several years for possible spontaneous resolution of the deformity. Triggering in digits other than the thumb in children is generally associated with an underlying diagnosis including anatomic abnormalities of the tendons, and metabolic, inflammatory, and infectious etiologies. Although some have advocated nonsurgical treatment, surgery is often necessary to address the underlying anatomic etiology. More extensive surgery beyond simple A1 pulley release is often required, including release of the A3 pulley and resection of a slip

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Key words Congenital trigger, pediatric trigger, trigger finger, trigger thumb.

TRIGGER THUMB IS ONE OF THE MOST common pediatric hand conditions and responds universally to simple surgical release. However, trigger fingers are more complex, often owing to systemic conditions or anatomical abnormalities, and require correspondingly more complex treatment. This review details the current understanding of these conditions, including treatment options, expected outcomes, and common complications. Additions to the literature on this topic in the past 3 years are highlighted.

CLINICAL PICTURE

Trigger thumb

Trigger thumb generally presents in children aged 1 to 4 years, with an incidence between 1 and 3 in 1,000.^{1,2} It can be bilateral, although both sides generally do not begin triggering at the same time. Because several large series of newborns failed to identify trigger thumbs, this is thought to be acquired rather than congenital. Reports of siblings and twins with trigger thumbs are common and some patients report a positive family history, which suggests a possible genetic predisposition.^{3–7} A recent study of all children presenting with trigger thumbs to a single hospital noted an ethnic makeup of 56% Hispanic, 18% white, 18% other, and 7% black. The authors noted that this was a statistically significant difference from the general makeup of the clinic: proportionally fewer black children and more Hispanic children presented with trigger thumbs.⁸

The etiology of trigger thumb in children remains a matter of debate. There is an anatomical mismatch such that the diameter of the tendon sheath is less than the diameter of the flexor pollicis longus (FPL) tendon, but the exact pathophysiology is still unknown. Khoshhal et al⁹ examined specimens from the A1 pulley of children who had undergone trigger thumb release and found both myofibroblasts and cyto-contractile proteins (vimentin and α -smooth muscle actin). The authors suggested from these findings that trigger thumbs result from a developmental fibrous tissue proliferation at the A1 pulley.

Trigger finger

Trigger digits other than the thumb present at about the same age as trigger thumbs, but 10 times less frequently.¹⁰ There are no reports of trigger digits being present at birth, which suggests that like trigger

thumbs, this is an acquired and not a congenital condition. Also in contrast to trigger thumbs, trigger fingers more often present with classic triggering symptoms rather than fixed or locked flexion posture. The middle finger is most commonly affected and patients may present with multiple and/or bilateral trigger fingers.^{10,11}

DIAGNOSIS

Trigger thumb

Unlike other trigger digits, the pediatric trigger thumb most commonly presents as a thumb that is locked in flexion at the interphalangeal (IP) joint (Fig. 1). There is a palpable nodule at the volar aspect of the metacarpophalangeal joint flexion crease, known as Notta's nodule. The condition is generally painless for locked thumbs although patients and parents may report discomfort when the thumb is forcibly extended. Although this name has become associated primarily with pediatric trigger thumb, it was first described in Notta's¹² original case series of adult trigger digits. A recent ultrasound study of children with trigger thumbs demonstrated no abnormalities of the FPL tendon or the A1 pulley, simply a size mismatch between the cross-sectional area of the tendon compared with that of the pulley. Interestingly, the authors noted that 2 patients with unilateral triggering had an enlarged FPL tendon on the initially unaffected side later began triggering, which suggested that ultrasound was a potential early diagnostic tool.¹³ Plain radiographs are generally not indicated when the history and clinical examination are consistent with a trigger thumb.

The differential diagnosis of trigger thumb includes congenital clasped thumb and thumb-in-palm deformity resulting from cerebral palsy or arthrogryposis. Trigger thumbs can also be mistaken for a fracture or dislocation of the thumb whereas Notta's nodule can be mistaken for a bony mass. Generally, children with cerebral palsy or arthrogryposis will be identified by other abnormalities beyond the thumb on physical examination. In addition, the thumb-in-palm deformity is characterized by adduction of the thumb into the palm, with either combined metacarpophalangeal (MCP) and IP flexion or MCP flexion with IP hyperextension. Similarly, the congenital clasped thumb consists of thumb adduction along with combined MCP and IP flexion.

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