Congenital trigger thumb
First Described by Notta in 1850
Definition

• Trigger finger is a condition in which there is a discrepancy between the size of the flexor tendon and its canal (sheet)
• Typically localised at the first pulley of the digits

This leads to:
  - SNAPPING/TRIGGER PHENOMENON or
  - CONTRACTURE in flexion or extension and/or
  - PAIN
Incidence of congenital trigger thumb

- Unknown (Rodgers and Waters 1994)
- 1:50-1:2000 (Berger 1997 reviewing literature)
MALE vs FEMALE

• Nearly the same (Ger 1991, Dinham 1974, Slakey 1996...
Right-left-Bilateral

- 1/3 of the cases are bilateral (Ger 1991, Dinham 1974, Slakey 1996, Nemoto 1996, Buchmann 1999…)
- 1/8 of the cases are bilateral (Moon 2001)
Differential diagnosis

- Spastic contractures (cerebral palsy)
- Clasped-thumb deformity
- Arthrogriposis
- EPL lesion, EPL absent
- Congenital Dupuytren
- Brachial plexus lesion
CONGENITAL?
Omission of a routine examination of the thumb in the neonate (Ger, Kupcha and Ger 1991)

Clenched-fist posture of newborn infants may delay detection of the deformity at birth (McCarroll 1985)
Congenital Thesis

1) Dinham and Megitt 1974: 19 cases with deformity noted at birth
2) Ger and Kupcha 1991: 11 cases with diagnosis at birth
Congenital Predisposition with a early presentation / delayed diagnosis

1) James 1960 bilateral presentation at 24 and 26 months, no history of trauma
2) Weber 1979: father and son, no story of trauma
3) van Genechten 1982: 6 members of the same family, in the case report no traumas
4) Thomas and Dodds 1999: bilateral trigger thumb in two identical twins (diagnosis at 4.y.o)
5) Vyas and Sarwahi 1999: mother and son case report
Inheritance?

• Shim, 2000: Autosomal dominant inheritance with reduced penetrance
Not congenital but acquired condition

• Rodgers and Waters (USA) 1994: 1046 consecutive newborns screened, no trigger thumb finger found

• Slakey and Hennrikus (USA) 1996: 4719 newborns prospectively screened: no trigger thumb found

• Moon 2001 (Korea): 7700 consecutive newborns: no trigger thumb or digit found

• Kikuchi and Ogino 2006: 1116 consecutive newborns, no trigger thumb or digit found. 2 newborns developed TT after 1 year.
Trigger?
A proper triggering is very rarely noted

Berger 1997:
- 21 thumbs
  - 16 flexion contracture
  - 7 limitation of movement (snapping?)
  - 3 extension contractures

The typical finding is a flexion contracture (all the references)

Better name?: ‘acquired thumb flexion contracture in children’ (Slakey and Hennrikus, 1996)
Thumb?
• Nemoto 1994: 3 fingers and 40 thumbs over 43 digits (7%)
• Hudson 1998: 8 fingers and 60 thumbs over 68 digits presented (11%)
• Moon 2001: 8 fingers and 35 thumbs over 45 digits (18%)
Etiology and Patophysiology
• Sheet thickening or too tight (Hueston 1972, van der Born 2000)
• Tendon nodule (Notta 1850, Fahey and Bollinger 1954)
• Sesamoids bigger than normal and too narrow (Grobb 1951, van Genechten 1982) restricting the tendon canal
Microscopical studies

- Fahey and Bollinger (no number of cases) observed collagenous degeneration and synovial proliferative changes in the tendon.
- Sprecher 1949 (2 cases): appearance was consistent with traumatic inflammation (lymphocytes and monocytes)

- White and Jensen 1953 (2 cases): tendon sheet with hyperplastic fibrous tissue.
- Hudson 1934 (1 case): fibrosis and dense connective tissue consistent with a congenital anomaly of development (of the sheet).
Microscopical studies

- Buchman 1999:
  11 cases examined under the electronic microscope:
  
  normal fibroblasts
  symmetric collagen fibers without any inflammatory or degenerative processes
Other causes of trigger thumb in infants

- Fibrous histiocyтомa attached to the profundus tendon (Iqbal, 1982).

- A foreign body granuloma with fibrous reaction within the flexor tendon sheath (Freund and Weigl, 1984).

- Soft tissue chondroma occurring within the superficialis tendon (Stockley and Norris, 1990).

- Granulating tissue post trauma (Chia 1996).
Diagnosis

• Peak of diagnosis between 12 and 36 months from birth
• Symmetric hands
• Usually no other malformations
• Nodule at the base of the thumb (MCP joint) volarly. Could be tender.
• Usually flexed fixed position
• Discomfort by trying to move the finger (“move the finger make the patient cry…”)
• Triggering very rare
• flex the metacarpophalangeal joint. By doing so, if there is no joint pathology and if the problem is merely congenital trigger thumb, it would be possible to extend the interphalangeal joint. During this maneuver, the nodule in the flexor pollicis longus will also vanish, as in surgery of A1 pulley release. (Yenidunya 1999)
Classification

- Watanabe 2001 (Sugimoto 1989)

<table>
<thead>
<tr>
<th>Stage</th>
<th>Condition</th>
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<tbody>
<tr>
<td>0</td>
<td>Normal</td>
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| 1     | Locking in flexion or extension  
       | Active movement with a triggering |
| 2     | Locking in flexion or extension  
       | Passive movement with a triggering |
| 3     | Locking in flexion or extension  |
Instrumental Diagnosis

• Head of Prox Ph volar deformity in long term follow up in congenital trigger thumb (Watanabe 2001)

• Acutely X ray are negative:
  – Wass 1994 (single case report of an A&E case)
  – Buchman 1999 on 11 cases
Treatment (?)
Spontaneous recovery

- 12% if patient is older than 6 months when diagnosis is done (Dinam and Megitt 1974: 13 thumbs had a recovery over 107 after 6 months of observation)

- 30% of recovery if real congenital (Dinam and Megitt 1974: 8 thumbs had a recovery over 26 after 12 months of observation)

- Mulpruek and Prichasuk 1998: 10 cases of spontaneous recovery over 42 patients. Previous story of trauma

- Dunsmuir and Sherlock 2000: 26 patients recovered over 53 (49%) after 12 months of observation

- Moon 2001: 12 over 35 trigger thumb had spontaneous recovery (waiting time up to 1 year, mean time 5 months)

All trigger fingers (6) of this serie recovered spontaneously
But

- Zadek 1942;
- Sprecher 1949;
- White and Jenson 1953
- Fahey and Bollinger 1954
- Ger et al 1991: two groups, observation for 6 and 44 months each: no recovery observed but sample is smaller: 11 patients with diagnosis before 6 m.o., 9 patients with diagnosis after 6 m.o.

All of them refuse this claim
Conservative treatment

• Mark and Buechel 1996: 30% of recovery with splint in extension if patient is younger of 6 months. (a.n.a.)

• Nemoto et al 1996: 43 digits treated with splint (mean age of patients 2 y.o.):
  – 40 thumb:
    • 26 recovery after 10 months (60%)
    • 7 improved (?)
    • 2 for surgery
    • 10 drop out from the study
Conservative treatment

- Watanabe 2001: 24 thumbs over 56 (41%) resolved after 12-90 months (mean 62 months).
  
  !18/24 with limited hyperextension!! 3 cases with P1 head deformity.
But

- Treatment with a splint is impractical and unsuccessful in young children as is steroid injection (McCarroll 1985; Tachdjian 1990)
- Herdem 2003: no recovery with splint
- Personal experience of Dr Scheker and Dr Tsai: they do not believe in conservative treatment
Surgery

• When?
  – Before 4 y.o for risk of residual contracture (Dinam and Megitt 1974: on 105 cases operated, 3 cases with residual contracture that were older than 4)
  – No flexion contracture in 12 patients operated older than 3 years (Mulpruek and Prichasuk 1998)
Surgical technique

• Pulley release, open, 1 week post op splinting in extension (Jahss 1936, Zadek 1942)

• Pulley release and nodule shaving
Alternative technique

- Pulley release, percutaneous (Wang and Ling 2004: 90% success rate in 40 thumbs, no nerve damage)
Move longitudinally and parallel

Needle blade parallel with flexor tendon

Not a pivot maneuver
But…

- van Loveren and van der Biezen 2007: release of A1 pulley is not enough…
  (16 thumbs, 11+ 3 distal pulleys divided other then A1)

Anatomy?
Outcome

Dunsmuir and Sherlock after open technique and pulley release (2000) → 4% of recurrence
F.U: 7.7 months (sample of 176 patients)

Mc Adams (2002): 30 thumbs reviewed after 15 years:
  no recurrence
  (but starting sample is not mentioned)

  23% loss of IPj motion
  17% MPj hyperextension
Pediatric Ganglion Cysts
• Ganglion cysts: Benign mucinous tumors arising from tendon sheets and joints
Ganglion Cysts

- Very common in the adult
- In the infant: the most common soft tissue tumors is the hemangioma
- Most soft tissue tumors in the kids are benign. Only 7-10% are soft tissue sarcomas
- Real incidence very difficult to determine
Ganglion Cysts

- Higher prevalence in females (1.6:1/4:1)
Etiology

• Unclear:
  – Possible herniation of synovial lining of a joint
  – Mucoid degeneration of connective tissue
Under the microscope

- Mucinous cyst filled with ialuronic acid
Clinical findings

- Usually mass that is not tender
- Sometimes very firm
- More often on the volar aspect of the hand or wrist
- DD with fibromas from the tendon sheet
Diagnosis

• Diagnosis is clinical
• Color doppler if there is the possibility of having a differential diagnosis with a pseudoaneurysm
Treatment

• Series that report remission up to 64% of the cases

• Aspiration: well described in the adult. In the infants not clear data are presented + risk of NV bundles damage. Recurrence rate varies if the cysts originates from the tendon sheet or the joints (tendon sheet has Higher recurrence rate)

• Surgical excision: (rate of recurrence published is around the 6%)