PAEDIATRIC TRIGGER THUMB

A rapid review exploring the evidence for non-operative management of paediatric trigger thumb

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BACKGROUND

- Paediatric trigger thumb (PTT) is a worldwide condition affecting 3 in every 1000 children
- Its aetiology is unclear with differing beliefs of a genetic predisposition with a familial history of trigger thumb or an imbalance between the FPL and the first annular pulley
- Children can present with either a locked in flexion IPJ or a dynamic triggering and up to 25% of patients experience bi-lateral trigger thumbs
- Classification of the different trigger grades has helped clarify treatment approaches; however, the optimal treatment remains controversial
- Literature suggests non-operative management involves observation, passive stretching or splinting, with variable time to achieve resolution and can restrict the IPJ range of movement in the long term
- The purpose of this project was to complete a literature review of non-operative management of PTT to create a local guideline to optimise patient treatment and pathway

METHODS

- A rapid literature review of Embase, CINAHL, Medline and Pubmed databases was completed
- Search terms included; conservative management, splinting, paediatrics and trigger thumb
- Accessible articles, studies able to be converted into English and those published since 2006 were included. Systematic reviews and meta-analyses were excluded due to word count restrictions
- 50 papers were screened by a single reviewer
- 10 papers included (see table) and the the Joanna Briggs Institute critical appraisal tool was applied

FINDINGS

- Farr and Taurok (2021), Dittmer et al (2020), Chalise et al (2013) and Jin et al (2020) classified stage of disease
- PTT splinting success ranged from 38.7%-92% by Farr and Taurok (2021), Yano et al (2020), Koh et al (2012), Lee et al (2006) and Jin et al (2011)
- Daily passive stretching success varied from 26.9%-80% over an average of 6-63 months by Kim et al (2022), Dittmer et al (2020), Chalise et al (2013), Marek et al (2011)
- There was heterogeneity between the papers for splint design, but not material
- None of the studies examined adherence to treatment or patient/parent demographics
- High risk of bias in papers examining stretching due lack of rigour in reporting outcomes
- High risk of population bias in Lee et al (2006) as only included reducible thumbs
- Jin et al (2020) splinted PTT in either MCP instability or hypermobility groups, reducing generalisability
- Marek et al (2011) and MacConnell et al (2023) surveyed treating clinicians, their findings align with this rapid review

Studies included in the critical appraisal

Authors	Research Design	Characteristics
Kim et al (2022)	Retrospective case-control study	407 children (6mo-12yr)
Farr and Taurok (2021)	Pilot study	13 children (0.1-3.8yr)
Dittmer et al (2020)	Retrospective case-series study	149 children (2-3yr)
Yano et al (2020)	Retrospective case-control study	112 children (1mo-9yr)
Jin et al (2020)	Retrospective cohort series	152 children (2.8yr-6.6yr)
Chalise et al (2013)	Case-control study	45 patients (3mo-7yr)
Koh et al (2012)	Retrospective case-control study	64 patients (3mo-8yr)
Lee et al (2006)	Retrospective case-control study	55 children (2mo-4yr)
Marek et al (2011)	Survey & questionnaire	173 children (0-6.5yr)
MacConnell et al (2023)	Cross-sectional survey	981 participants (NA)

Study	Splint Design	Regime
Koh et al (2012)	Hand based coil splint	Nightly for 3/12
Yano et al (2020)	Hand based coil splint	Nightly until resolution of trigger (reviewed at 3-6mo). Offered surgery if no improvement
Lee et al (2006)	Forearm based static splint	24/7 for 6-12/52, then nightly until resolution
Farr and Taurok (2021)	Forearm based static splint incl all digits	Nightly for 3/12 minimum
Jin et al (2020)	Post-operative cast in both groups for 1/52, then a hand based static splint in MCP instability group only	24/7 for 5/52 for the MCP instability group

CONCLUSION

The evidence regarding non-operative management for PTT demonstrates treatment variations and is of weak methodological quality. A lack of disease classification and disparities regarding optimal splint design and regime and stretching regime is required. Further research into the barriers to non-operative management to inform and establish local evidence-based treatment guidelines is recommended.

NEXT STEPS

1. Implement a classification system for PTT in local department to guide treatment choice
2. Review non-operative patients after 6/12 and consider social circumstance/ compliance to date of child to direct pathway further
3. Concurrently develop a questionnaire to gather data on age, neurodiversity, additional needs and social demographics and adherence to therapy for PTT with 3/12 reviews
4. Present to the surgical team and establish new pathway for PTT management within the hand unit
5. Implement treatment protocol for PTT

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Farr, S. and Taurok, D. (2021) 'Splinting for the treatment of pediatric trigger thumbs: A pilot study', *Wiener Medizinische Wochenschrift*, 172(13–14), pp. 294–295. Doi:10.1007/s10354-021-00860-8.

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Watanabe, H. et al. (2001) 'Conservative treatment for trigger thumb in children', Archives of Orthopaedic and Trauma Surgery, 121(7), pp. 388–390. Doi:10.1007/s004020000249.

Yano, K. *et al.* (2020) 'Clinical results of splinting versus observation for pediatric trigger thumb', *Journal of Pediatric Orthopaedics B*, 30(4), pp. 346–350. Doi:10.1097/bpb.0000000000000790.

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