Conservative Management of Camptodactyly: A Literature Review and Treatment Guidelines

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Methods:

Objectives:

A new paediatric hand therapy service was set up in University Hospital Southampton in 2022. Camptodactyly was one of the most common conditions referred into the service for conservative management. Camptodactyly is a non-traumatic flexion deformity of the proximal interphalangeal (PIP) joint in one or multiple digits (Hogarth and Abzug, 2021). It is estimated to affect 1% of the population (Rayan and Upton, 2014) and commonly presents in infancy, affecting males and females equally or during a rapid period of growth in adolescence, when it is more prominent in females (Comer and Ladd, 2015). Splinting, stretching and exercises are the most common conservative interventions (Wang et al, 2020), however it is unclear which, if any, therapeutic approach is most effective. The purpose of this project was to complete a comprehensive literature review of conservative management of camptodactyly and create a local treatment guideline based on the best available evidence.

A thorough literature search was completed using AMED, CINAHL, MEDLINE, COCHRANE library and EMBASE databases. The key search terms were "Camptodactyly", "Systematic Review", "Randomized Control Trial", "Literature Review" and "Guidelines", as well as their derivatives and Boolean operators. Case studies, conference abstracts, non-English literature and studies which only focused on surgical management of camptodactyly were excluded. The results of the search were imported into a word document and duplicates were removed. Titles were screened for eligibility and eight potentially eligible articles were read in their entirety, of which four were included (See table). A thorough critical appraisal of the evidence was completed and a local treatment guideline was created based on the best available evidence and discussion with the wider hand therapy and surgery team.

There is a sparsity of research regarding conversative management of camptodactyly. This void is particularly surprising as there is a consensus that conservative treatment should be the first line intervention for camptodactyly (Foucher et al, 2006; Lethbridge and Wollin, 2014; Yannascoli and

Goldfarb, 2018; Wang et al, 2020). Both systematic reviews rated their included studies as of weak methodological quality using different scales. Most studies made explicit and specific treatment recommendations regarding splinting and passive stretching for conservative management of camptodactyly which all differed from one another, despite largely citing the same small body evidence. Only one study (Rhee et al, 2010) looked at stretching as the sole intervention and demonstrated a significant improvement in flexion deformity but was time intensive and only included children under three. The evidence largely supports the effectiveness of splinting and stretching

but the optimal regime has not been established.

Studies Included in the Critical Appraisal					
Systematic Reviews					
Authors:	No of Studies included:	Type of Studies included			
Lethbridge and Wollin (2014)	5	5 retrospective cohort studies			
Wang et al (2020)	16	7 case series, 9 retrospective cohort studies			
Guidelines/Cohort Studies					
Authors:	Type of Study	No of patients			
Foucher et al (2006)	Treatment algorithm justified through Retrospective VS prospective data	Retrospective group= 33 Prospective group= 35			
Yannascoli and Goldfarb (2018)	Clinical Guidelines	Nil. Guidelines justified with literature and clinical experience.			

Conclusions

Most of the available evidence regarding splinting and stretching for camptodactyly is of weak methodological quality. Treatment varies hugely amongst the literature. Clarification regarding the optimal splinting regime and type of splint has yet to be established. The efficacy of stretching and optimal stretching regime has not been determined. A local guideline was created based on the best current available evidence and is used in consideration with the specific individualised needs of the patient with regular monitoring to optimise outcomes.

References:



Scan me!

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Variations in Splinting Recommendations						
Author	Indication for splinting	Splint type	Regime			
Foucher et al (2006)	"Stiff" joint	< 3-years-old: Static splint with forearm attachment Older patients: Dynamic splint fitted to x- lite glove with dorsal support blocking MCP in 65 degrees flexion.	Night-time for 12 – 20 weeks.			
Lethbridge and Wollin	PIPJ	1. Dynamic splint *	24 hours			
(2014)	contracture >20 degrees	 Dynamic splint* in the day. Static volar extension splint at night. 	24 hours			
		1. Static Volar extension splint*< 6 years old = forearm-based splint to maintain in place	15-18 hours/ overnight			
Yannascoli and Goldfarb (2018)	joints in extension. < 8 years old = forearn maintain in place.		Not stated			
		Dynamic Splint to be used during the day "in addition and age dependent", if PIP contracture is <45 degrees.				
Wang et al (2020)	N/A	N/A	N/A			

Results:

Variations in Stretching Recommendations					
Authors	Indications for stretching	Type of Stretch	Frequency		
Foucher et al (2006)	N/A	N/A	N/A		
Lethbridge and Wollin (2014)	<20-degree PIP contracture	Stretching approach not specified	Frequency not specified		
Yannascoli and Goldfarb (2018)	All patients	Isolated PIP stretch	5-minute stretch x 4 times a day		
Wang et al (2020)	N/A	N/A	N/A		

University Hospital Southampton Guidelines for Conservative Management of Camptodactyly

Initial Assessment

- Confirm Diagnosis of camptodactyly.
- Classify using Benson et al (1994)
- Measure and document passive and active ROM using a goniometer. PIP ROOM should be measured with wrist and MCPs;
 - 1) In neutral.
 - 2) In extension to assess FDS tightness.
- 3) in flexion to assess any extensor insufficiencies.
- Discuss treatment options with caregivers and child (where appropriate) and select a treatment regime which best suits the needs of the patient and their caregivers.
- Provide education regarding diagnosis, treatment options and monitoring for any adverse complications such as skin breakdown or increasing flexion contracture.
- Provide information Sheet.



Stretching Regime

- Consider a PIP stretching regime as the sole intervention for young children (<2 years old) who have a flexion contracture of <20 degrees.
- Vigilant, regular monitoring required to check for any change in flexion deformity.
- Stretching regime:
- An isolated PIP joint stretch should be advised.
- Additional PIP extension stretches with wrist and MCP in extension or flexion can be added as clinically indicated.
- Stretches should be incorporated into an established routine e.g. around nappy changes or meal times.
- Stretching can be used in conjunction with a splinting regime.

Splinting Regime

- Splint all patients with a flexion contracture of >20 degrees.
 - Static Volar extension splint, with a forearm extension for those <3 years old or when clinically indicated.
- Splint should be worn at night-time for a minimum of 9 hours.
- A dynamic capener splint can be considered in adolescents for daytime use in addition to nighttime splinting.
- Regular monitoring to adjust the splint to accommodate gains in ROM or for growth spurts.
- Refer for surgical opinion if PIP contracture >60 degrees and patient concerned re functional or aesthetic appearance. Consider referral if rapid progression of flexion contracture (<30 degrees within one year).

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