

Conservative Management of Camptodactyly: A Literature Review and Treatment Guidelines

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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.

Methods:

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.

Results:

There is a sparsity of research regarding conservative 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<br>Prospective group= 35                   |
| Yannascoli and Goldfarb (2018)             | Clinical Guidelines                                                     | Nil. Guidelines justified with literature and clinical experience. |

| 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                                                                                                                       | Night-time for 12 – 20 weeks. |
|                                         |                              | Older patients: Dynamic splint fitted to x-lite glove with dorsal support blocking MCP in 65 degrees flexion.                                                              |                               |
| Lethbridge and Wollin (2014)            | PIPJ contracture >20 degrees | 1. Dynamic splint *                                                                                                                                                        | 24 hours                      |
|                                         |                              | 1. Dynamic splint* in the day. Static volar extension splint at night.                                                                                                     | 24 hours                      |
|                                         |                              | 1. Static Volar extension splint*                                                                                                                                          | 15-18 hours/ overnight        |
| Yannascoli and Goldfarb (2018)          | Not stated                   | < 6 years old = forearm-based splint to maintain in place                                                                                                                  | Not stated                    |
|                                         |                              | Night-time static extension splint. MCP, IP joints in extension.                                                                                                           |                               |
|                                         |                              | < 8 years old = forearm-based splint to maintain in place.<br>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                           |

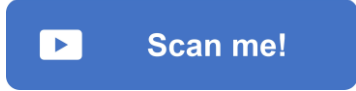
Conclusions

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:

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| 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

