REVIEW ARTICLE

Collagenase clostridium histolyticum for Dupuytren's disease: a comprehensive systematic review and comparative analysis against percutaneous needle aponeurotomy and limited fasciectomy

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ABSTRACT

This systematic review compared the efficacy of collagenase clostridium histolyticum (CCH) against percutaneous needle aponeurotomy (PNA) and limited fasciectomy (LF) for Dupuytren's contracture. Searches were conducted in PubMed, Embase, and Web of Science databases to March 2024. Randomised controlled trials (RCTs) were included. Primary outcomes included successful contracture correction as defined by included studies. Secondary outcomes included recurrence rates, patient-reported outcomes, and adverse events. A total of 11 studies (969 patients) were included. Meta-analysis showed no difference in efficacy between CCH and PNA (Relative Risk [RR]: 1.01, 95% Confidence Interval [CI]: 0.93–1.09). Recurrence rates were also similar (RR: 1.18, 95% CI: 0.95–1.48). Data suggested higher recurrence risk with CCH versus LF (RR: 6.84, 95% CI: 1.59–29.48). In some studies, CCH was associated with higher rates of haematoma, local pain, and oedema. CCH demonstrates comparable efficacy to PNA; however, it may have a higher risk of local complications and recurrence compared to LF. Treatment decisions should be made on a case-by-case basis.

Introduction

Dupuytren's disease (DD) is a progressive fibroproliferative disorder involving the palmar fascia of the hand [1]. Characterised by thickening and shortening of the fascia, the condition leads to the gradual development of fixed flexion contractures of the fingers, predominantly affecting the ring and little fingers [2]. This pathological condition, first detailed by Baron Guillaume Dupuytren in 1831, poses significant functional impairment and reduces the quality of life in affected individuals, making effective treatment a crucial area of research in hand surgery [3].

The aetiology of DD is complex and multifactorial, involving genetic predisposition, environmental factors, and microvascular injuries [4,5]. With an ageing population, the incidence of DD is expected to rise, underscoring the need for effective management strategies that can be tailored to the severity of the disease and the specific needs of the patient.

Treatment modalities for DD have evolved significantly over the years, transitioning from invasive techniques to more conservative approaches as understanding of the disease's pathophysiology advanced [6–9]. The primary aim of treatment is to restore hand function by releasing the fibrotic cords causing contracture. Operative and non-operative treatments are available, with the choice of procedure depending on the stage of the disease, the patient's functional status, and their personal preferences. While open fasciectomy has previously been considered the gold standard, its associated morbidity and prolonged recovery times have prompted the development and adoption of alternative approaches. Limited fasciectomy (LF), a less extensive version of the traditional open fasciectomy, involves the surgical removal of the diseased fascia while attempting to preserve more of the surrounding healthy tissue [10,11]. This approach aims to balance the need for thorough disease removal with reduced morbidity and faster recovery compared to more radical surgical techniques. However, the invasive nature of surgery, prolonged recovery, and the potential for significant complications such as nerve damage and infection warrant the utilisation of alternative treatment options for many patients.

One treatment, collagenase clostridium histolyticum (CCH) injection has emerged as a notable non-surgical option. CCH is an enzyme derived from Clostridium histolyticum bacteria that specifically targets and breaks down type I and III collagen, the primary components of Dupuytren's cords [12–14]. The treatment involves injecting CCH directly into the cord, followed by manipulation of the affected finger after 24–72 hours to rupture the weakened cord. This method has shown promise in reducing contracture with a simple, in-office procedure that allows rapid recovery and minimal downtime [15].

Another non-surgical technique, percutaneous needle aponeurotomy (PNA), uses a needle to puncture and weaken the cord tissue, allowing the fingers to be manipulated back into extension [8,9,16]. This technique, which can be performed under local anaesthesia, has gained popularity due to its low complication rate and quick recovery time. However, concerns about its long-term efficacy and recurrence rates have led to ongoing debates about its place in the treatment algorithm.

Given the variations in treatment efficacy, safety, and patient-centric outcomes, a review comparing these treatments is warranted. This systematic review aims to compare CCH against the other two primary treatment modalities – PNA and LF – and evaluate the

comparative effectiveness, safety, and patient-reported outcomes among these treatments.

Methods

Study identification

This systematic review adhered to the Preferred Reporting in Systematic Review and Meta-Analysis (PRISMA) guidelines (Supplementary Figure 1), and was listed on the International Prospective Register of Systematic Reviews (PROSPERO) [17]. A comprehensive search was conducted to identify relevant studies comparing the use of CCH against PNA and LF for treating DD. PubMed, Embase, and Web of Science databases were searched from their inception until March 2024. The following search terms were used: ('Dupuytren*' OR 'Dupuytren's contracture' OR 'Dupuytren's disease' OR 'palmar fibromatosis') AND ('collagenase Clostridium histolyticum' OR 'CCH' OR 'Xiaflex' OR 'Xiapex') AND ('percutaneous needle fasciotomy' OR 'percutaneous needle aponeurotomy' OR 'PNF' OR 'PNA' OR 'needle fasciotomy' OR 'needle aponeurotomy' OR 'limited fasciectomy' OR 'partial fasciectomy' OR 'fasciectomy'). The search was not limited by language to minimise the risk of language bias. The reference lists of all included studies and relevant reviews were screened for any additional studies.

Study inclusion

Inclusion criteria were as follows: studies of human participants, study design was limited to prospective randomised control trials (RCTs), the included outcomes were either the rate of intervention success (as indicated by the study) or the relevant scores on secondary outcome scoring systems utilised (e.g. Quick Disabilities of the Arm, Shoulder, and Hand Score (Q-DASH) [18] or Unité Rhumatologique des Affections de la Main Score (URAM) [19]. Only studies that provided sufficient data to calculate relative risks (RR), or mean differences with 95% confidence intervals (CI) were eligible for consideration of meta-analysis.

Exclusion criteria included: non-randomised cohort studies, case control studies, case reports, reviews, conference presentations, cross-sectional studies, editorials, letters to the editor, lack of relevant outcomes reported.

Data extraction

Titles and abstracts of all identified articles in the search were reviewed by two independent reviewers (JC/RR), and any discrepancies were resolved through discussion and consensus or the involvement of a third reviewer where necessary. Data were extracted into data extraction tables. These data points included the first author, publication year, country of the study, age, sample size, definition of primary outcome success, number of patients successfully achieving the primary outcome, follow up time, and the secondary outcomes utilised. The latest outcome data were recorded when outcomes were reported at multiple time points in the study.

Risk of bias assessment

The risk of bias for the included studies was evaluated using the Cochrane Risk of Bias (ROB) tool, designed explicitly for RCTs [20]. This tool is extensively utilised to assess the potential for bias within randomised trials and includes seven key domains prone to bias: random sequence generation, allocation concealment, blinding of participants

and personnel, blinding of outcome assessors, completeness of outcome data, selective reporting, and other bias. The assessment was conducted independently by two reviewers (JC/RR). Discrepancies between reviewers were resolved through discussion, and, if necessary, a third reviewer was consulted to reach a consensus. In relation to the blinding of participants and personnel, it is often impractical to blind study participants in such trials; therefore, studies were typically assigned a high risk of bias in this category.

Statistical analysis

A meta-analysis was performed to determine the overall relative effect size for comparing the efficacy of CCH with PNA and LF. The outcome measure of a reduction of joint contracture to <5° was chosen as the primary comparator between studies given that this was the most commonly reported outcome measure among included studies and deemed an outcome measure that is reproducible with a low chance of bias. Furthermore, meta-analyses of the risk of recurrence between treatment modalities at the end of reported follow up times were conducted. Additional meta-analyses evaluated the relative effectiveness of these treatment modalities using the Q-DASH and URAM scoring systems employed across the studies. Heterogeneity among studies was quantified using the I^2 statistic, and pooled risk ratios along with 95% CI were calculated employing random-effects models. An I^2 statistic greater than 50% was interpreted as indicating high heterogeneity. All statistical analyses were carried out using the Review Manager software version 5.4 [21].

Results

Literature search

From the initial search, a total of 593 studies were identified. After the removal of duplicate records, 522 unique studies were available for further evaluation. These studies underwent an initial screening based on their titles and abstracts. As a result, 65 studies were deemed relevant and were selected for a detailed full-text review. Furthermore, 8 additional studies were screened from citations of relevant articles. Following this, 11 publications ultimately met the criteria for inclusion in the study (Supplementary Figure 1).

Study characteristics

The included studies were published between 2016 and 2024. At the end of follow up, sample sizes ranged from 21 to 187 participants, totalling 969 patients across all included studies (Table 1). All studies were conducted in Nordic countries such as Sweden, Denmark, or Finland – except two studies, one by Abe et al. in 2020 which originated from Japan and one by Thoma et al. in 2023 originating from Canada. All studies evaluated the comparative efficacy of CCH with either PNA and/or LF. Ten studies compared CCH with PNA and two compared CCH with LF. Follow-up periods varied from 12 months to 5 years. Outcome measures were varied in the manner in which success was reported; yet, most included studies evaluated the number of patients that reached a reduction of joint contracture to <5°. Several secondary patient reported outcome measures were also assessed among the included studies, including Q-DASH and URAM scores most commonly.

Risk of bias

Study quality was assessed using Cochrane Risk of Bias 2 Tool (Supplementary Figures 2 & 3). Randomisation and adherence bias

Table 1. Summary of studies comparing collagenase clostridium histolyticum to percutaneous needle aponeurotomy.

Author	Year	Country	CCH (n)	PNA (n)	Joints treated	Definition of success	Achieved successful outcome, n (%)	Secondary outcomes	Follow up*	Definition of recurrence	Recurrence rate
Scherman (A)** [22]	2016	Sweden	39	42	MCP + PIP	Reduction in total passive extension deficit (TPED)	Median reduction: CCH = 70% PNA = 70%	Q-DASH Score URAM Score	12 months	Recurrence of ≥20° of joint contracture	CCH = 4 (10%) PNA = 5 (12%)
Stromberg (A) [23]	2016	Sweden	67	71	MCP	Reduction of MCP contracture to <5°	CCH = 60 (90%) PNA = 64 (90%)	URAM Score VAS	12 months	Recurrence of ≥20° of joint contracture	CCH = 1 (1%) PNA = 1 (1%)
Skov [24]	2017	Denmark	24	19	PIP	Reduction of MCP contracture to <5°	CCH = 0 (0%) PNA = 1 (5%)	DASH Score	24 months	Recurrence of ≥20° of joint contracture	CCH = 20 (83%) PNA = 13 (68%)
Stromberg (B) [25]	2017	Sweden	20	19	MCP	Reduction of MCP contracture to <5°	CCH = 19 (95%) NF = 18 (95%)	VAS	12 months	Recurrence of ≥20° of joint contracture	CCH = 0 (0%) NF = 1 (5%)
Scherman (B)** [26]	2018	Sweden	36	40	MCP + PIP	Reduction in total passive extension deficit (TPED)	Median reduction: CCH = 51% PNA = 75%	Q-DASH Score URAM Score	36 months	Recurrence of ≥30° of joint contracture	CCH = 12 (33%) PNA = 17 (43%)
Stromberg (C)** [27]	2018	Sweden	76	76	MCP + PIP	Reduction of joint contracture to <5°	CCH = 58 (76%) PNA = 60 (79%)	Q-DASH Score URAM Score VAS	24 months	Recurrence of ≥20° of joint contracture	CCH = 10 (13%) PNA = 9 (12%)
Abe** [28]	2020	Japan	31	31	MCP + PIP	Reduction of joint contracture to <5°	CCH = 31 (100%)† PNA = 31 (100%)†	Q-DASH Score URAM Score	36 months	Recurrence of ≥20° of joint contracture	CCH = 8 (26%) PNA = 9 (29%)
Bystrom [29]	2022	Sweden	45	57	MCP	Reduction of joint contracture to <5°	CCH = 23 (51%)‡ PNA = 27 (47%)‡	Q-DASH Score URAM Score	60 months	Recurrence of ≥20° of joint contracture	CCH = 36 (56%) PNA = 30 (45%)
Jorgensen [30]	2022	Denmark	32	36	MCP	Reduction in total passive extension deficit (TPED)	Median reduction: CCH = 67% PNA = 79%	Q-DASH Score	36 months	Recurrence of ≥30° of joint contracture OR reintervention	CCH = 17 (47%) PNA = 6 (19%)
Raisanen** [31]	2024	Finland	92	95	MCP + PIP	Reduction of joint contracture to <5°	CCH = 32 (34%) PNA = 23 (24%)	Q-DASH Score VAS EQ-5D EQ-5D-3L Score	24 months	Reintervention	CCH = 9 (10%) PNA = 10 (10%)

CCH: Collagenase Clostridium Histolyticum; PNA: Percutaneous Needle Aponeurotomy; MCP: Metacarpophalangeal joint; PIP: Proximal interphalangeal joint; Q-DASH: Quick Disabilities of the Arm, Shoulder, and Hand Score; URAM: Unité Rhu-matologique des Affections de la Main Score; VAS: Visual Analogue Score; EQ-5D: European Quality of Life 5 Dimensions Score; EQ-5D-3L: European Quality of Life 5 Dimensions 3 Level Version Index Score; TPED: Total Passive Extension Deficit; NR: Not Reported.

*Longest follow up time period reported in the included studies is reported here.

**Results presented reflect changes to the MCPJ.

†Results reported at 30 days of follow up.

‡A number of patients were excluded from final analysis due to re-treatment.

Scherman 2018 is a study of the same patients as Scherman 2016 with longer follow up.

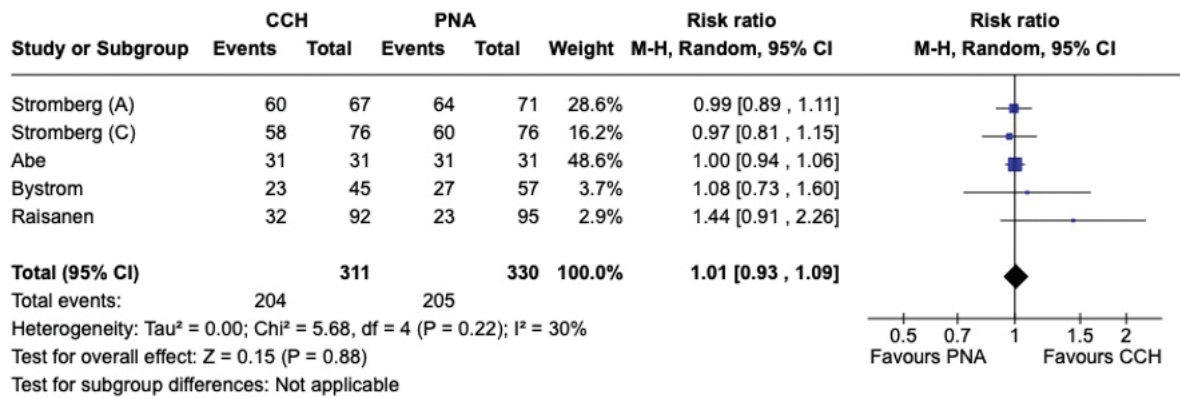Stromberg 2017 enrolled a sub-population of patients from Stromberg 2016.

Figure 1. Forest plot displaying meta-analysis of studies comparing collagenase clostridium histolyticum (CCH) with percutaneous needle aponeurotomy (PNA) using a reduction in joint contracture to <5° as a marker of success.

was minimal across the examined studies. All papers used validated methods, either computer generated or manual, to randomise patients to their intervention. Furthermore, given the surgical nature of the interventions, adherence generally was not an issue. Some patients were required to wear night splints; however, across the board, authors report good adherence to this. Attrition bias was also low except in the Thoma et al. 2023 study where 36% of the initial study population (22) were lost to follow up. The largest source of bias within all papers was in blinding of outcome assessors. While some papers attempted to blind investigators to the intervention, other papers either did not attempt this, or made mention of the potential for patients to reveal their intervention to the investigators. Given the nature of the interventions, it was not possible to blind patients to the treatment they had received in the included studies. Thus, all studies scored high risk for this risk of bias.

CCH versus PNA

Ten studies reported the success of CCH treatment compared with PNA (Table 1). Of these, five studies were eligible for quantitative meta-analysis given that they used comparable outcome measures and patient populations. Pooled meta-analysis showed no significant difference in success rates at the end of follow up between CCH and PNA (RR: 1.01, 95% CI: 0.93 to 1.09) (Figure 1). Heterogeneity among the studies was low (I^2 = 30%). Similarly, no significant difference in rates of recurrence were observed between the two treatment modalities (RR: 1.18, 95% CI: 0.95 to 1.48, I^2 = 0%) (Figure 2). URAM

scores were also comparable between the two groups (standardised mean difference [SMD]: 0.12, 95% CI: −0.35 to 0.59, I^2 = 74%) (Supplementary Table 1, Figure 3). Lastly, Q-DASH scores were also not significantly different between the two groups among included studies in quantitative analysis (SMD: 0.08, 95% CI: −0.13 to 0.29, I^2 = 0%) (Supplementary Table 1, Figure 4).

CCH versus LF

Only two studies reported results comparing CCH to LF (Table 2). Unfortunately, no comparable outcome measure was reported between the two studies to allow for quantitative analysis of the two studies. One study by Thoma et al. in 2023 showed no significant difference scores on the Michigan Hand Questionnaire (MHQ) as their primary outcome [32,33]. Furthermore, they found no difference in URAM scores between the two cohorts (Supplementary Table 2). Another study by Raisanen et al. in 2024 displayed comparable success rates between CCH and LF; however, they reported a statistically significant increased risk of recurrence/reintervention for CCH when compared with LF (Table 2) [31]. A meta-analysis of the risk of recurrence of CCH versus LF was performed which displayed a greater risk of recurrence with CCH compared with LF (RR: 6.84, 95% CI: 1.59 to 29.48, I^2 = 0%) (Figure 5).

Complications

Complications were regularly reported among the included studies (Supplementary Table 3). Studies were significantly heterogenous in
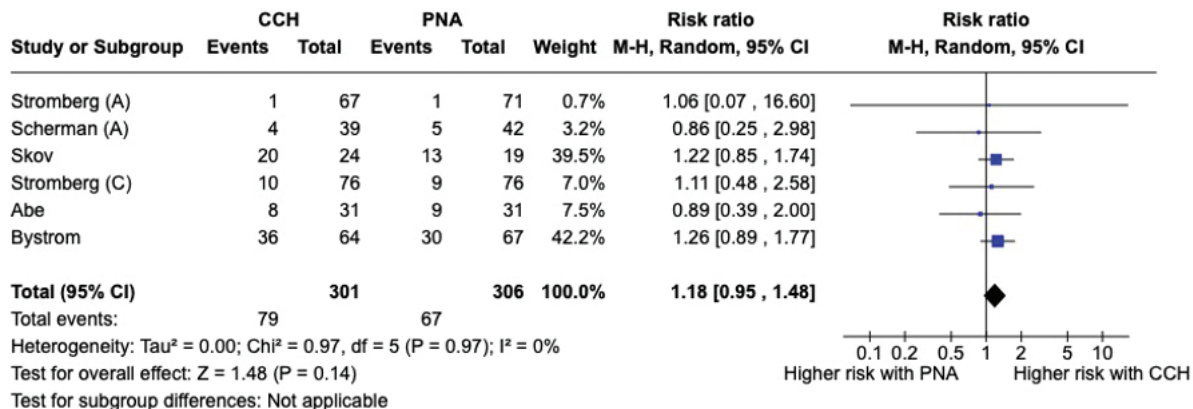

Figure 2. Forest plot displaying meta-analysis of studies comparing risk of recurrence of collagenase clostridium histolyticum (CCH) versus percutaneous needle aponeurotomy (PNA).
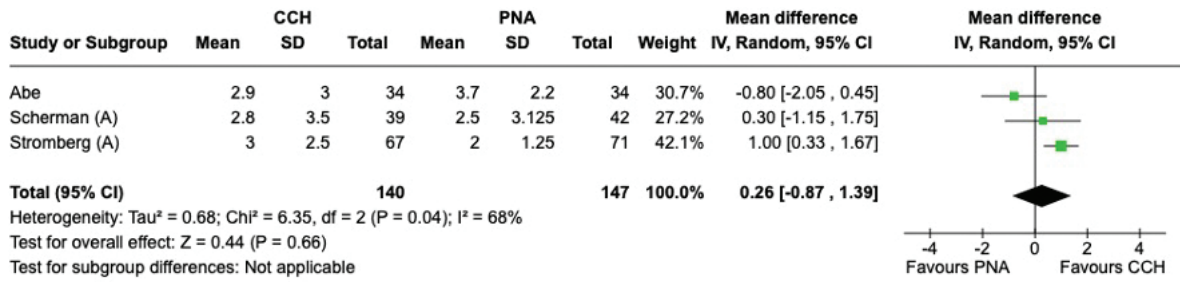
Study or Subgroup	CCH Mean	SD	Total	PNA Mean	SD	Total	Weight	Mean difference IV, Random, 95% CI
Abe	2.9	3	34	3.7	2.2	34	30.7%	-0.80 [-2.05 , 0.45]
Scherman (A)	2.8	3.5	39	2.5	3.125	42	27.2%	0.30 [-1.15 , 1.75]
Stromberg (A)	3	2.5	67	2	1.25	71	42.1%	1.00 [0.33 , 1.67]
Total (95% CI)			**140**			**147**	**100.0%**	**0.26 [-0.87 , 1.39]**

Heterogeneity: Tau² = 0.68; Chi² = 6.35, df = 2 (P = 0.04); I² = 68%
Test for overall effect: Z = 0.44 (P = 0.66)
Test for subgroup differences: Not applicable

Figure 3. Forest plot displaying meta-analysis comparing Unité Rhu-matologique des Affections de la Main (URAM) scores for collagenase clostridium histolyti-cum (CCH) versus percutaneous needle aponeurotomy (PNA).

the manner in which they reported adverse complications from the various treatments. Twenty different complications and their respective rates among the included studies are displayed in Supplementary Table 3. It was deemed that given the significant heterogeneity and lack of standardised assessment between studies, quantitative meta-analysis of these results was not feasible. Skin rupture was the most commonly reported complication among the included studies. Among each study individually, there was no statistically significant difference in rates of skin rupture between CCH and PNA. Yet, in one study by Stromberg et al. in 2016 the size of the skin rupture was significantly larger in the CCH group compared to the PNA cohort [23]. The authors also reported a higher rate of haematoma with the use of CCH when compared with PNA. Another study by Skov et al. in 2017 found a significantly higher rate of complications in the CCH cohort (mainly pain and local oedema) when compared with their PNA cohort [24]. Additionally, Abe et al. displayed significantly greater rates of complications in their CCH group than in PNA [28]. Overall, a narrative for a greater rate of complications (particularly haematoma, local pain and local oedema) has been associated with the use of CCH when compared with PNA. Comparisons between the rate of complications between CCH and LF were much more limited (Supplementary Table 3)

Discussion

This systematic review and meta-analysis compared the efficacy, recurrence rates, and patient-reported outcomes of CCH against PNA and LF for the treatment of DD. The results suggest that CCH has comparable efficacy to PNA in terms of achieving contracture correction, with no significant differences in success rates or recurrence at follow-up. However, CCH appears to have a higher risk of recurrence compared to LF; although data comparing these two modalities was limited.

Meta-analysis demonstrated no significant difference in success rates between CCH and PNA in achieving contracture correction to

less than 5° at the end of follow up (RR: 1.01, 95% CI: 0.93 to 1.09). This suggests that both minimally invasive techniques are similarly effective in the short-term management of Dupuytren's contractures. This finding aligns with previous studies that have shown both techniques to be effective treatment options for diseased [6,8,9,15,16]. Importantly, there was also no significant difference in recurrence rates between CCH and PNA (RR: 1.18, 95% CI: 0.95 to 1.48). This is a key consideration, as the durability of treatment effect is important for decision making and the long-term management of DD. The similar recurrence rates suggest that neither technique offers a clear advantage in terms of long-term efficacy.

In contrast, the comparison between CCH and LF revealed a significantly higher risk of recurrence with CCH (RR: 6.84, 95% CI: 1.59 to 29.48). This finding must be interpreted cautiously due to the limited number of studies (only two) comparing these modalities directly. Nevertheless, it aligns with the general understanding that more invasive techniques like LF may offer more reliable and long-lasting results, albeit at the cost of increased surgical morbidity.

The analysis of patient-reported outcomes using standardised measures like the Quick Disabilities of the Arm, Shoulder, and Hand (Q-DASH) score and the Unité Rhumatologique des Affections de la Main (URAM) score showed no significant differences between CCH and PNA, suggesting that from the patient's perspective, both treatments result in similar functional improvements and satisfaction levels. The lack of difference in these scores is particularly relevant as it captures the patient's experience of treatment outcomes, which may not always correlate directly with objective measures of contracture correction.

When looking at complications, this review revealed a trend towards a higher rate of certain adverse events with CCH compared to PNA, particularly haematoma, local pain, and local oedema. However, the heterogeneity in reporting complications across studies made it challenging to perform adequate quantitative comparative meta-analyses of these outcomes. The higher rate of certain complications with CCH may be attributed to its mechanism of action, which involves enzymatic degradation of collagen, potentially
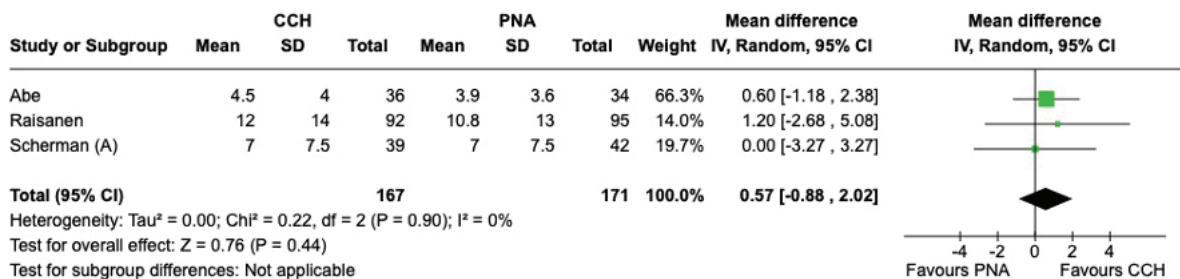
Study or Subgroup	CCH Mean	SD	Total	PNA Mean	SD	Total	Weight	Mean difference IV, Random, 95% CI
Abe	4.5	4	36	3.9	3.6	34	66.3%	0.60 [-1.18 , 2.38]
Raisanen	12	14	92	10.8	13	95	14.0%	1.20 [-2.68 , 5.08]
Scherman (A)	7	7.5	39	7	7.5	42	19.7%	0.00 [-3.27 , 3.27]
Total (95% CI)			**167**			**171**	**100.0%**	**0.57 [-0.88 , 2.02]**

Heterogeneity: Tau² = 0.00; Chi² = 0.22, df = 2 (P = 0.90); I² = 0%
Test for overall effect: Z = 0.76 (P = 0.44)
Test for subgroup differences: Not applicable

Figure 4. Forest plot displaying meta-analysis comparing Quick Disabilities of the Arm, Shoulder, and Hand Score (Q-DASH) scores for collagenase clostridium histolyticum (CCH) versus percutaneous needle aponeurotomy (PNA).
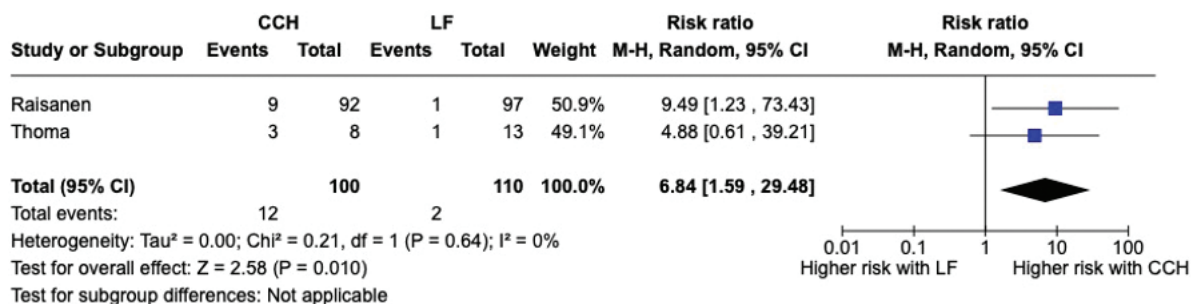
Figure 5. Forest plot displaying meta-analysis of studies comparing risk of recurrence of collagenase clostridium histolyticum (CCH) versus percutaneous needle aponeurotomy (PNA).

leading to more local tissue reactions compared to the mechanical action of PNA. Skin ruptures were commonly reported for both CCH and PNA, with no consistent significant difference between the two treatments. This complication, while generally minor, is an important consideration for patient counselling and post-procedure care. The similar rates of skin rupture may suggest that this risk is inherent to the process of cord disruption, regardless of whether it is achieved enzymatically or mechanically. Some studies reported higher rates of local pain, oedema and haematoma with CCH, which may impact short-term recovery and patient comfort. However, these effects were generally transient and did not appear to significantly affect long-term outcomes or patient satisfaction.

The findings of this review have several important clinical implications. Firstly, the comparable efficacy and recurrence rates between CCH and PNA suggest that both treatments can be considered viable options for the management of Dupuytren's contractures in appropriate patient populations. The choice between these two modalities may therefore depend on other factors such as physician expertise, patient preference, cost considerations, and specific patient characteristics. The potential for higher recurrence rates with CCH compared to LF highlights the need for careful patient selection. Patients with more severe or recurrent disease may benefit more from LF, while those with milder disease or those prioritising quicker recovery might be better suited for CCH or PNA. The similar patient-reported outcomes between CCH and PNA are reassuring, indicating that both treatments lead to meaningful improvements in hand function and quality of life from the patient's perspective. This underscores the value of these less invasive approaches in the management of DD.

This review has several limitations that should be considered. The heterogeneity in outcome measures and follow-up periods across studies made it challenging to combine all available data in meta-analyses. The limited number of studies directly comparing CCH to LF restricts our ability to draw firm conclusions about their relative efficacy and safety. In addition, the follow-up periods in most included studies were relatively short, which may not capture the full picture of long-term recurrence rates and outcomes. DD is a chronic, progressive condition, and longer-term studies are needed to fully understand the durability of treatment effects. Future research should focus on standardising outcome measures and complication reporting to facilitate more robust comparisons between treatment modalities. Long-term follow-up studies are crucial to better understand the recurrence patterns and need for retreatment with different approaches. Additionally, studies examining cost-effectiveness and patient satisfaction over time would provide valuable information for clinical decision-making.

Conclusion

This systematic review and meta-analysis suggest that CCH is comparable to PNA in terms of efficacy, recurrence rates, and patient-reported outcomes for the treatment of Dupuytren's contractures. While CCH may have a higher risk of recurrence compared to LF, more studies are needed to confirm this finding. The choice of treatment should be individualised based on disease severity, patient preferences, and the balance between efficacy, rates of recurrence and potential complications. As our understanding of DD and its management continues to evolve, ongoing research will be crucial to refine treatment algorithms and improve long-term outcomes for patients with this condition.

Statement of human and animal rights

This article does not contain any studies with human or animal subjects.

Conflicting interests

The author(s) declare no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

Contributorship

Literature review and data collection: J.C., R.R. Writing initial draft: J.C. Critical review and critique: All authors. Data analysis: J.C., R.R., I.S. Conceptualisation: All authors. Supervision: W.M.R. All authors reviewed and edited the manuscript and approved the final version of the manuscript.

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Table 2. Summary of studies comparing collagenase clostridium histolyticum to limited fasciectomy.

Author	Year	Country	CCH (n)	LF (n)	Joints treated	Primary outcome	Achieved primary outcome, n (%)	Secondary outcomes	Follow up*	Definition of recurrence	Recurrence rate
Thoma [33]	2023	Canada	8	13	MCP + PIP + DIP	MHQ Score	No difference in MHQ scores between the two groups	HUI-3 Score URAM Score SDSS Score ROM of Digits	12 months	Reintervention	CCH = 3 (23%) LF = 1 (12.5%)
Raisanen [31]	2024	Finland	92	97	MCP + PIP	Reduction of joint contracture to <5°	CCH = 32 (34%) LF = 40 (41%)	Q-DASH Score VAS EQ-5D EQ-5D-3L Score	24 months	Reintervention	CCH = 9 (10%)** LF = 1 (1%)**

CCH: Collagenase Clostridium Histolyticum; LF: Limited Fasciectomy; MCP: Metacarpophalangeal joint; PIP: Proximal interphalangeal joint; DIP: Distal interphalangeal joint; MHQ: Michigan Hand Questionnaire; URAM: Unité Rhu-matologique des Affections de la Main Score; HUI-3: The Health Utility Index-3; SDSS: Southampton Dupuytren Scoring Scheme.

*Longest follow up time period reported in the included studies is reported here.

**Statistically significant difference.

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