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ORIGINAL STUDY

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Treatment practice for Dupuytren disease in Belgium before 2020: results from an online survey

Maarten Van Nuffel, Caroline Meulyzer, Charlotte Vrancken, Eric Van den Kerckhove, Luc De Smet, Ilse Degreef

From the University Hospitals Leuven, Belgium

The treatment of Dupuytren disease (DD) continues to evolve. New insights in risk factors for recurrence and new treatment modalities have changed the management strategies for DD over the past decades. However, several differences may remain between these insights and their clinical application. The current tendencies in management of Dupuytren disease, were investigated in a web-based survey. The survey was sent to all members of the Belgian Hand Group, the professional organisation of hand surgeons in Belgium. The participants indicated their preferred treatment for clinical cases and answered questions on the use and timing of splinting, physiotherapy, medication and adapting the management depending on fibrosis diathesis. These findings were compared to recommendations found in the literature. Forty out of 135 surveyed members of the Belgian Hand Group completed the survey and 7 responded incompletely, yielding a response rate of 35% for most questions. This is comparable to similar studies. There appeared to be still room for debate on surgical techniques for difficult cases. CCH use increased since reimbursement became available in Belgium, mainly due to satisfying clinical results for patient and surgeon. The survey demonstrated a wide variety in pre- and postoperative splinting protocols, but consensus existed with the literature on postoperative night-time application of orthoses for 7 to 12 weeks.

Keywords: Dupuytren disease; online survey; splinting; scar management; collagenase.

INTRODUCTION

Despite being a condition that has been known for centuries, the treatment of Dupuytren disease (DD) continues to evolve. Over the past decades, the understanding of risk factors predicting recurrence risk after surgical treatment has led to concept of Dupuytren diathesis, later broadened to "fibrosis diathesis" *(1)*. Patients with a high fibrosis diathesis have an inherent higher risk for suboptimal result and early recurrence, meaning they might benefit

- Maarten Van Nuffel[1], MD,
- Caroline Meulyzer[1,2], MSc,
- Charlotte Vrancken[3], MD,
- Eric Van den Kerckhove[2,4], PhD,
- Luc De Smet[1], MD, PhD,
- Ilse Degreef[1], MD, PhD.

[1]KU Leuven-University of Leuven, Department of Medical Sciences, University Hospitals Leuven, Department of Orthopaedic Surgery, Hand Unit, Leuven, Belgium

[2]KU Leuven-University of Leuven, Department of Rehabilitation Sciences, University Hospitals Leuven, Department of Physical Medicine and Rehabilitation, Leuven, Belgium.

[3]PArel, General Practioners Network, Borgloon, Belgium.

[4]Department of Plastic, Reconstructive and Hand Surgery, Maastricht University Medical Center, Maastricht, The Netherlands.

Correspondence : Dr. Maarten Van Nuffel, Hand unit, University Hospitals Leuven, Herestraat 49, 3000 Leuven, Belgium.
Email : maarten.vannuffel@kuleuven.be

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from additional measures *(2,3)*. On the other hand, the commercial availability of injectable collagenase enzymes from clostridium histolyticum (Collagenase Clostridium Histolyticum, CCH) provided a radically different non-surgical treatment option *(4,5)*. This led to changes in treatment protocols worldwide, but the real advantage over surgery and percutaneous needle fasciotomy (PNF) remains a point of discussion, especially given the substantial financial cost of CCH *(6)*. Despite this ongoing discussion, CCH was reimbursed in Belgium from the end of 2012, after demonstrating its clinical efficacy, until the end of 2019. In this study, we wanted to evaluate the treatment tendencies for Dupuytren disease, to determine if surgeons incorporate the fibrosis diathesis into their decision-making and what the place of CCH in their treatment plan had become. Furthermore, we investigated which non-surgical elements were commonly used in the treatment of DD, in which circumstances and if this was in line with the evidence from the literature.

MATERIALS AND METHODS

An online survey, consisting of clinical cases and multiple-choice questions, was developed on the Surveymonkey website (SurveyMonkey Inc. San Mateo, California, USA). This survey was sent out electronically to all members of the Belgian Hand Group, the professional organisation of hand surgeons in Belgium, in the spring of 2016; followed by reminder emails in the fall of 2016. The survey was discussed with the Ethical Committee and the board of the Belgian Hand Group, this type of research did not need formal ethical approval or informed consent from the participants.

The first 5 questions showed a clinical picture and short description of the hand of a patient with Dupuytren disease in increasing severity of contracture. Question 1 and 2 showed involvement of only the fifth ray, with only metacarpophalangeal (MCP) joint involvement in the first case and MCP plus proximal interphalangeal (PIP) joint in the second. Question 3 showed a patient with more severe involvement in two rays and a question 4 a very severe recurrence case despite previous surgical treatment in a patient with high fibrosis diathesis. Question 5 showed a peroperative view of a very severe case where shortage of the volar neurovascular bundle makes full extension of the finger impossible and forces you to change your strategy (Figure 1). All possible treatment methods are demonstrated in table I. In question 6,

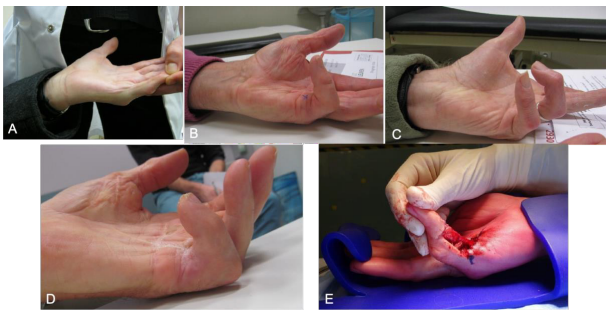

Figure 1. — Clinical pictures question 1-5
Description: see text.

Table I. — Possible treatment strategies for clinical cases

Nothing
Ointments
Splinting
Fysiotherapy: Stretching + scar management
Corticosteroid infiltration
Percutaneous needle aponeurotomy/fasciotomy
Collagenase injection + manipulation
Partial or limited fasciectomy (eg Moermans)
Fasciectomy
Dermofasciectomy with open palm technique (McCash)
Dermofasciectomy with full thickness graft (Hueston)
Dermofasciectomy with flap coverage (Jacobsen, radial forearm,...)
PIP arthrodesis
Amputation
Radiotherapy
Nothing
Ointments
Splinting
Fysiotherapy: Stretching + scar management
Corticosteroid infiltration
Other (please specify)

respondents were asked to indicate which elements of fibrosis diathesis would make them change their strategy. If participants indicated the use of a cream or ointment, they were asked to specify which type in question 7.

Questions 8-14 dealt with CCH treatment: whether participants used CCH (question 8), why not (question 9), preferred indications (question 10), practical aspects (question 11), increase or decrease over de past years (question 12), reasons for increase (question 13) and reasons for decrease (question 14).

The next series of questions dealt with peri-operative physiotherapy (PT): the use and purpose of preoperative PT (question 15 and 16), the use, duration, and frequency of postoperative PT (question 17-19), treatment methods and/or complications for which PT was indicated (question 20-29) and specific referral for scar management (question 30-32). The last questions were on the use of splinting: preoperative splinting (question 33-35) and postoperative splinting, including type, frequency and duration (question 36-41).

RESULTS

Forty out of 135 surveyed members of the Belgian Hand Group fully completed the survey and 7 responded incompletely, yielding a response rate of 35% for most questions.

There was a clear tendency for more aggressive treatment with increasing severity of the contracture, as demonstrated in figure 2. CCH injections were the most popular choice in the first two cases,

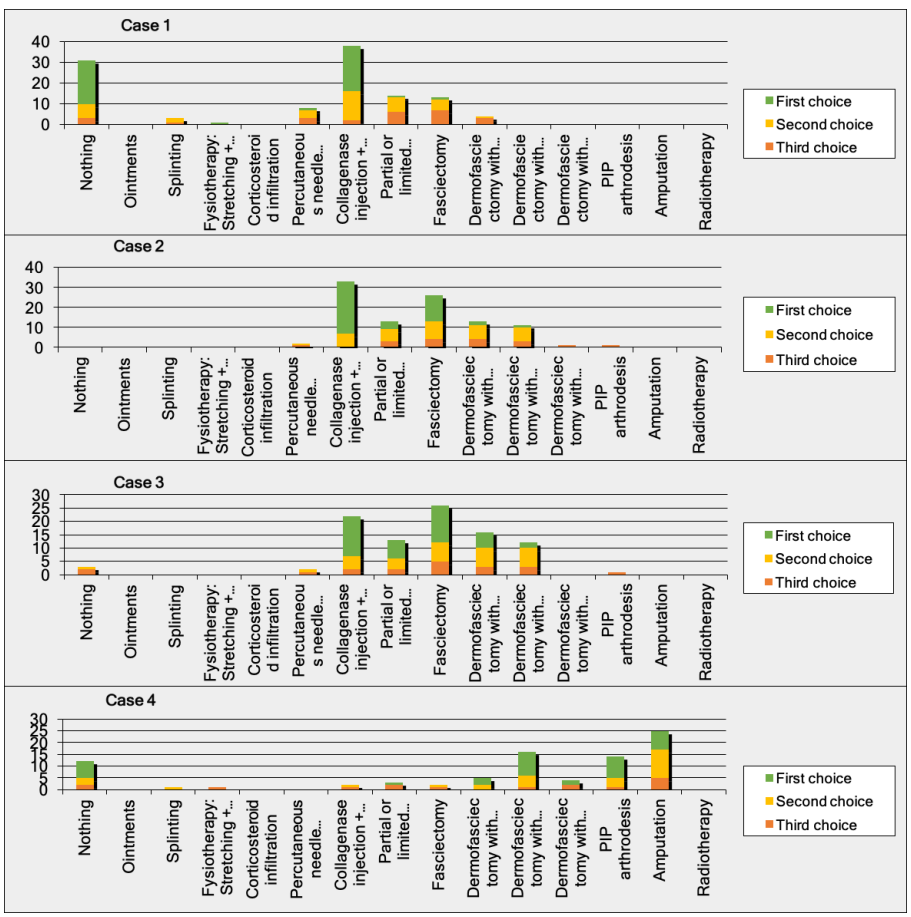

Figure 2. — Preferred treatment options for clinical cases 1-4.

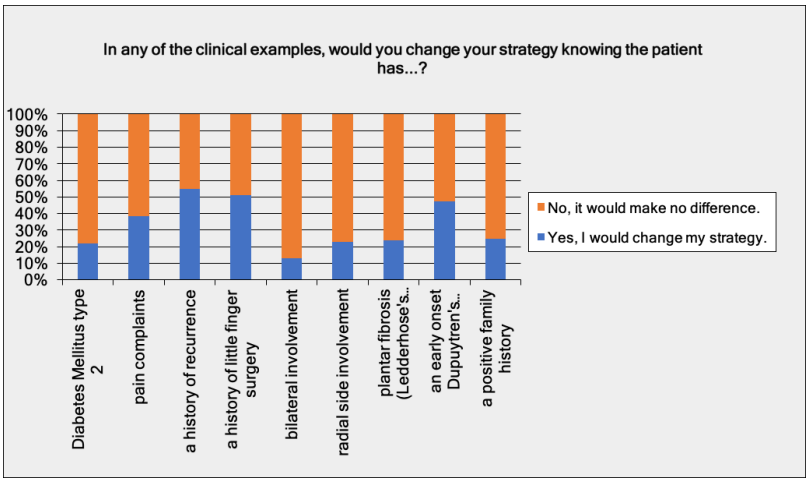

Figure 3. — Importance attached to risk factors for recurrence.

although in the first case a "wait-and-see" approach was almost as popular, both as first and second choice. For the second case, doing nothing was no longer considered a valuable option, in favor of fasciectomy, with limited fasciectomy and dermofasciectomy considered as second choices in the majority of responses. There was less consensus for the third case, with CCH still the most popular as first choice (32%), fasciectomy was close second (30%) and was also the more popular as second or third choice. Dermofasciectomy with open palm technique or full thickness grafting (FTG) were the most frequent options as second or third option. For the fourth case, there were different approaches: dermofasciectomy was the first option (32%), mostly with FTG for closure, while some preferred open palm technique or a local flap. PIP joint arthrodesis was considered the first option in 19%, and amputation in 17%. However, amputation was the most frequent second and third option. Interestingly, doing nothing was a valuable first option for 15% of participants. For the last clinical case, 37.2% of respondents would prefer to accept this position and close with a full thickness graft, whereas 32.6% would perform a shortening arthrodesis of the PIP joint, 11% suggested to dissect the neurovascular bundles more proximally and close with a FTG and 7% would choose an amputation.

When asked about different risk factors indicating a higher recurrence risk, the majority of the participants indicated they would only alter their strategy if a patient had a history of recurrence (55%) or little finger surgery (51.2%). An early onset of the disease (>50 years old) would make a difference to 47.5% of the respondents. All other factors would be a reason to change the strategy for less than 25% of the surgeons (Figure 3).

Despite none of the participants indicating cream or ointment as their preferred treatment in the clinical cases, 29.8% reported sporadic use, with very little consistency in the products suggested. Cicaplast (La Roche Posay, France) and Remederm (Louis Widmer, Utikon, Switzerland) were suggested twice each, whereas Alhydran (BAP Medical, Apeldoorn, The Netherlands), non-steroidal anti-inflammatory drugs (NSAID), dimethyl sulfoxide (DMSO) cream, hydrating Nivea cream (Beiersdorf AG, Hamburg, Germany), Cica-care (Smith & Nephew, London, United Kingdom) and ScarBan (BAP Medical, Apeldoorn, The Netherlands) were only mentioned once.

The vast majority (88.4%) of participants indicated that they used CCH treatment. The surgeons who did not use CCH indicated insufficiently convincing scientific evidence (75%), the financial cost (75%), a preference for other techniques (50%) and past bad experience (25%) as the main reasons. The proportions of participants using CCH for different indications are summarized in figure 4. Different practical aspects concerning CCH treatment are

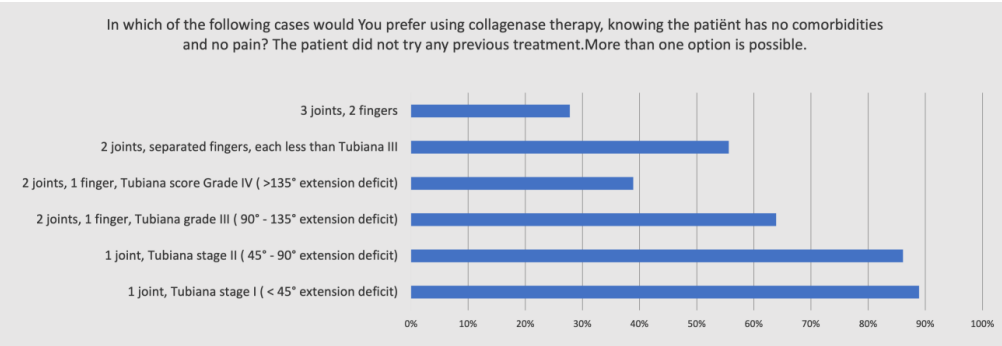

Figure 4. — Indications for CCH treatment.

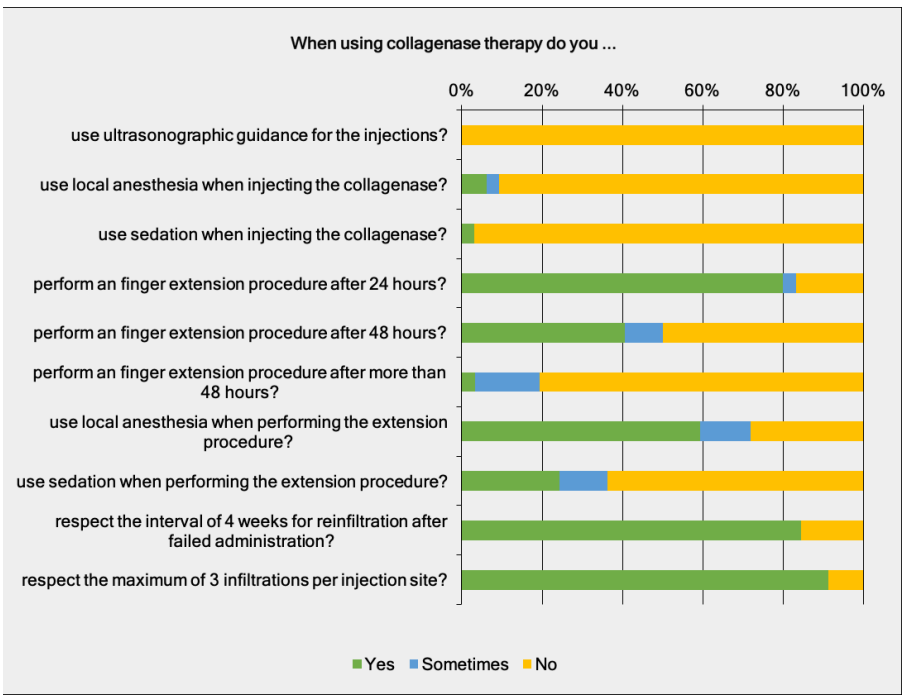

Figure 5. — Practical aspects of CCH use.

illustrated in figure 5. Since its introduction, the use of CCH had increased in 61.1% of respondents, remained the same in 30.6% and decreased in 8.3%. Reasons for increased and decreased use are illustrated in figure 6.

In the next part of the survey, 75.6% of the respondents indicated they never worked together with a physiotherapist preoperatively, 14.6% did this sometimes and only 9.8% always. (Figure 7a) Of those referring patients for PT preoperatively, the purpose was to take measurements for a postoperative splint in 50%, preoperative evaluation and measurements in 40%, preserve or gain power and hand function in 30% and increase mobility in 10%. (Figure 7c) Postoperatively, patients were always referred for PT in 19.5%, depending on the surgical technique in 24.4%, only for certain complications in 24.4% and in 31.7% for both certain techniques and complications. None of the respondents never sent a patient for PT postoperatively. (Figure 7b)

The most common treatment methods after which patients were referred for PT were fasciectomy and dermofasciectomy with different methods of wound closure. These and other indications for PT

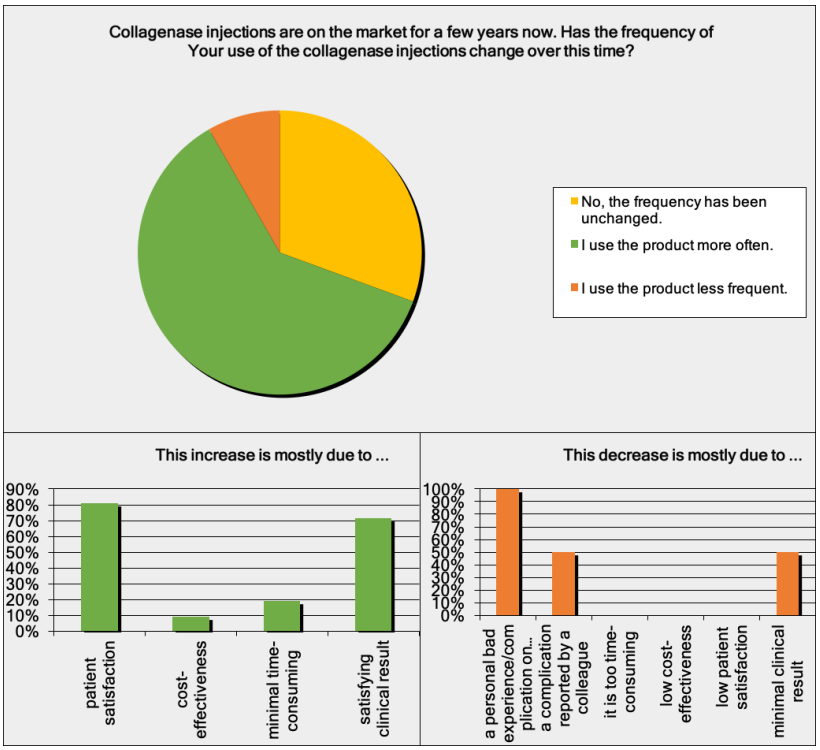

Figure 6. — Evolution of CCH use.

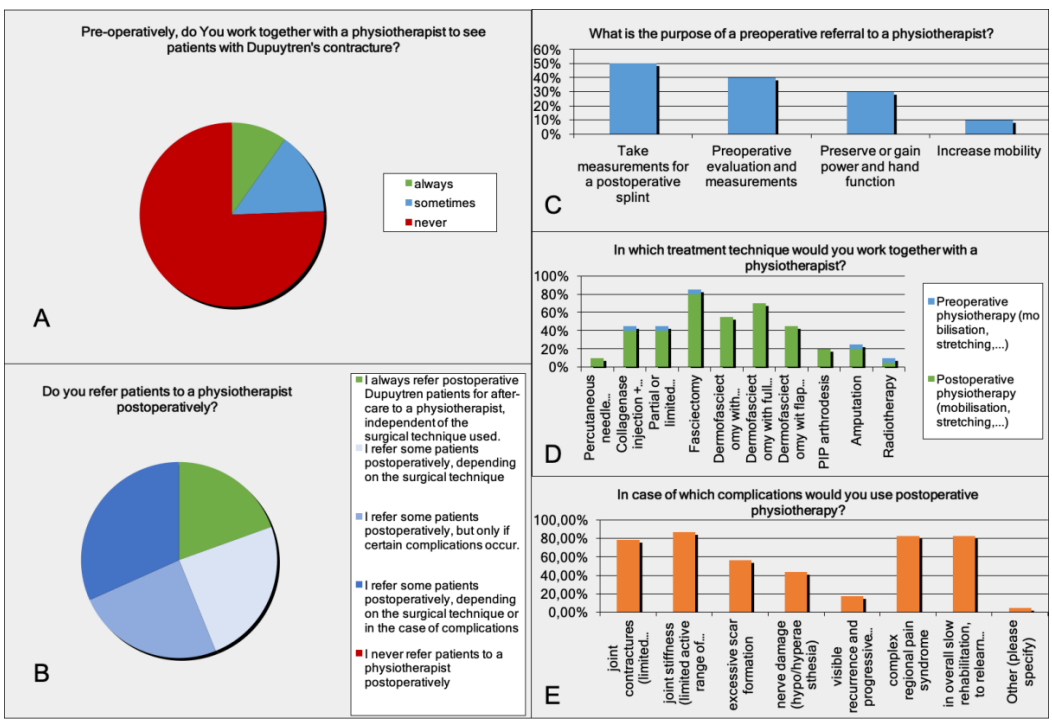

Figure 7. — Pre- and postoperative referral for PT: distribution and indications.

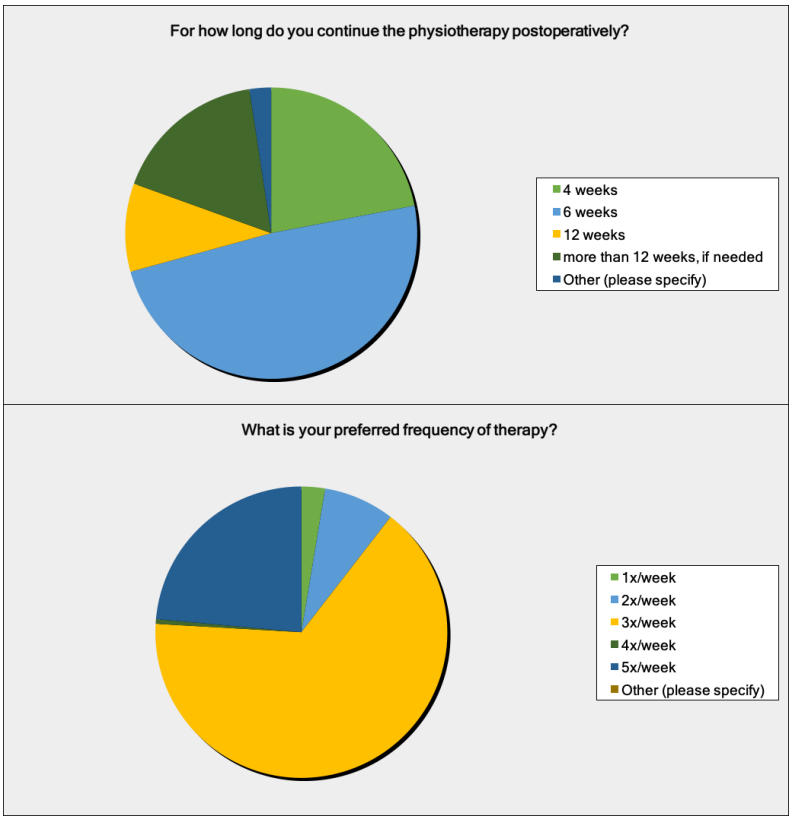

Figure 8. — Preferred duration and frequency of PT postoperatively.

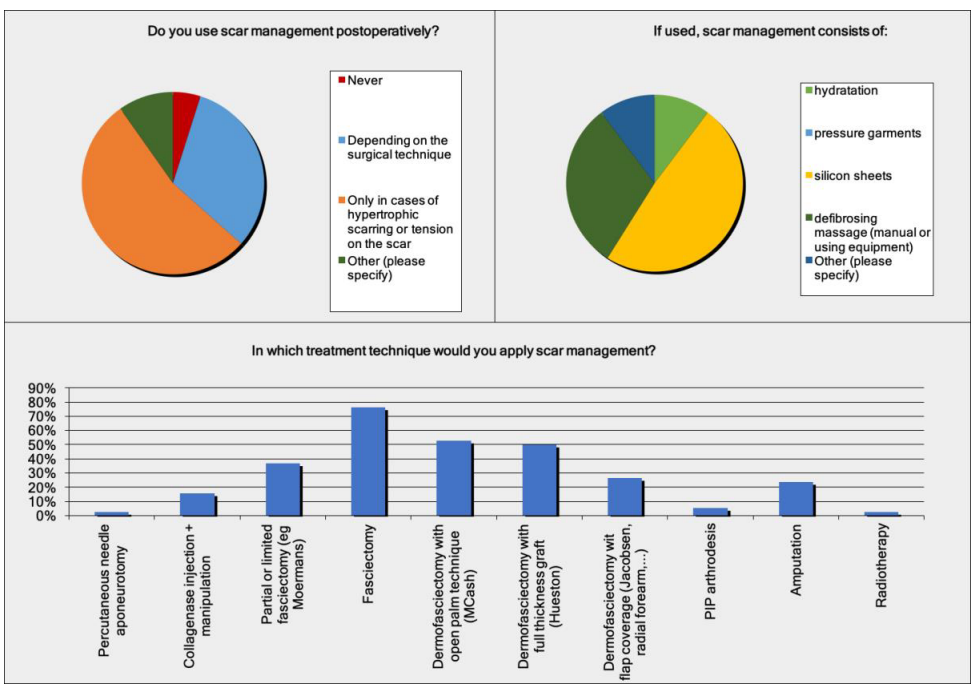

Figure 9. — Distribution, methods and indications of scar management.

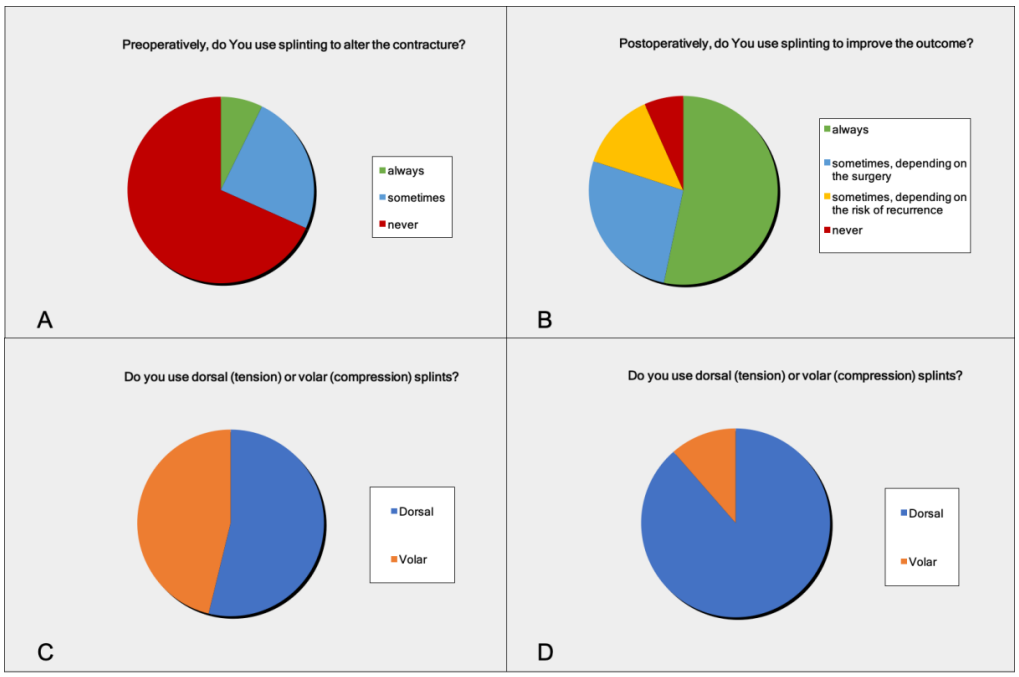

Figure 10. — Comparison between pre- and postoperative splinting.

referral are illustrated in figure 7d. Complications for which patients were referred for PT were mostly joint stiffness (limited active motion) and joint contractures (limited passive motion), complex regional pain syndrome and an overall slow rehabilitation. These and other complications are illustrated in figure 7e.

Almost half of the respondents would continue PT for 6 weeks, and in more than 60% they preferred a rate of 3 times per week. Distributions of preferred duration and frequency are shown in figure 8.

When asked specifically about referral for scar management, more than half of the respondents indicated they would only use this in cases of hypertrophic scarring or tension on the scar and for about one third it would depend on the surgical technique, mostly after fasciectomy and dermofasciectomy. Distribution, methods, and indications are illustrated in figure 9. If used, scar management mainly consisted of silicone sheets or defibrosing massage (Figure 9b).

In the final part, respondents were asked about their splinting regime. The majority (68.3%) indicated they never used splinting preoperatively, whereas 24.4% said they used it sometimes and only 7.3% use it in every patient. For preoperative splinting, a dorsal splint was used in 53.8% and a volar splint in 46.2%. (Figure 10a and 10c) The advised length of both daytime and nighttime splinting varied from 0 to 12 weeks, with an average of 2 weeks for daytime splinting and 4.4 weeks for nighttime splinting. The number of hours of daytime splinting varied from 0 to 12 hours with an average of 4.2. For postoperative splinting, the situation was clearly different. Here, 53.3% of respondents indicated they would always recommend splinting, for 26.7% it would depend on the type of surgery, for 13.3% this would depend on the risk of recurrence and only 6.7% indicated they never splint postoperatively. (Figure 10b) When the splinting depended on the type of treatment, fasciectomy and dermofasciectomy with open palm technique or FTG were the most common indications. However, limited fasciectomy, CCH treatment of PNF could also be an indication for postoperative splinting.

A dorsal splint was far more popular postoperatively, being used by 88.6% of respondents. (Figure 10d) On average, respondents would recommend 3.8 weeks of daytime splinting, with a range from 0 to 12 weeks, with an average of 7.4 hours during

the day. Nighttime splinting would be advised for 4 to 12 weeks, with an average of 7.5 weeks.

DISCUSSION

In this study, we evaluated treatment habits for DD in hand surgeons in Belgium at a moment when CCH was reimbursed, making it widely available for selected patients.

With increasing severity of the contracture, more extensive surgical resection of cords and even involved skin was deemed more appropriate. Of course, salvage methods such as shortening PIP arthrodesis and amputation become a more preferred option in the most severe cases. However, a conservative approach with acceptance of the situation was also advocated in these very challenging contractures. The responses for the clinical cases demonstrated that CCH had earned its place in the armamentarium of the hand surgeon. The majority of surgeons indicated that the use of CCH had gradually increased and even in the more challenging clinical cases they would still consider this as an option. Remarkably, both PNF and limited or partial fasciectomy, two interventions with similar indications to CCH, were much less frequently selected, especially as a first-choice treatment. There was little consensus on the use and type of cream or ointment in DD.

Changes in treatment strategy would be mostly based on local factors such as a history of recurrence or little finger surgery. Factors outside of the affected hand, such as bilateral involvement or Ledderhose disease, have more limited impact, despite evidence that these are also significantly correlated with recurrence risk *(1-3,7)*. Only a young age of onset would have an impact in nearly half of the respondents, probably because the need for a second or third intervention would be higher in these younger patients. It remains unclear if these same risk factors are equally valid for CCH as well.

Preoperative referral to a physiotherapist was done by less than 25% of respondents and was mostly aimed at measurements, including splint fitting. Postoperatively, all respondents referred patients for PT at least on some occasions: after more extensive surgery or when complications occurred, mostly for joint stiffness or an overall problem with the rehabilitation. Given these indications, PT involved mostly mobilization and stretching, but scar management was employed as well in complications and after more extensive surgical release. Nearly 5% of the respondents indicated however that they did not use this in their postoperative treatment. The number of PT sessions generally required seems rather high, with treatment durations up to 12 weeks and more at a rate of 3-5 times per week.

Hand therapy after treatment for Dupuytren disease comprises in the first place physical therapy exercises, both active and passive *(5,8-14)*. However, other elements may be grip strengthening *(11)*, wound care *(11)*, orthotic treatment *(5,11,12-14)* and scar and oedema management *(11)*.

The Handguide Study, published in 2013, aimed to achieve consensus on treatment guidelines for Dupuytren disease. The experts concluded that a postoperative treatment should always be given, independent of the surgical technique used. They advised that the patient should always receive postsurgical instructions and exercise therapy *(8)*. Our survey demonstrated that in reality, this is not yet the case. The total duration of the exercise therapy should last 3 to 8 weeks and should be discontinued when the phase of postoperative scar contracture has passed. This is in line with the observations from our survey. Some authors have questioned the use of hand therapy after fasciectomy, with one study not demonstrating a significant difference in outcomes with or without hand therapy *(8)*. For CCH treatment, hand therapy was not deemed necessary in the first recommendations *(4)*. However, in later studies range of motion exercises were advocated, especially in cases of severe flexion contracture *(5,15,16)*.

A similar trend to PT was seen concerning splinting protocols in our survey: preoperative use was more limited to about one third of the respondents and there was no consensus on volar versus dorsal splinting. On the other hand, more than 90% of the respondents would use a splint postoperatively and there was a clear tendency to deploy dorsal splints. Since dorsal splints can more easily be worn in combination with a bandage, they

can be used earlier after the operation and even in cases with delayed wound healing.

According to the Handguide study, postsurgical splinting should be performed only on indication (8), whereas more than half of the respondents in our survey would always prescribe a splint. A systematic review from 2008 demonstrated only low-level evidence for postoperative splinting and a risk of deficits in composite finger flexion and hand function *(17)*. Several other studies, all involving dorsal splinting, have contested the routine use of splinting postoperatively. Among these were 3 randomized controlled trials (RCT's), that could not find a significant additive benefit of orthotic treatment over postoperative hand therapy alone. No significant adverse effect on finger flexion or hand function was reported, although some patients mentioned discomfort from wearing the splint *(9,11,18)*. One study, without a control group, found that after CCH injections, severe PIP joint contractures benefited from a dorsal orthosis and targeted exercises *(16)*. However, night extension splinting did not improve active ROM after PNF in a retrospective chart review *(19)*. There are even less data on volar splinting. Rivlin et al. used a combined protocol of 3 weeks dorsal splinting, followed by volar splinting and found a clearly lower incidence and milder form of flare reaction and less hypertrophic or hypersensitive scarring compared to the literature, but did not report on ROM in their retrospective chart review *(20)*. Brauns et al. compared volar compression orthoses to dorsal tension splinting as a non-operative treatment in a randomized controlled trial and found no difference in correction of ROM, but volar compression orthoses appeared to be more effective and better tolerated *(21)*.

In our survey, we found little agreement on the duration of splinting, daytime splinting, and the number of hours the splint had to be worn. There is no consensus on this matter in the literature neither, with all studies implementing night-time splinting, but only a few using daytime splinting for 1 to 4 weeks in *(16,18,20)*. The duration of night-time splinting varies as well, ranging from 6 weeks to 6 months postoperatively.

An inherent disadvantage of this kind of surveys is the dependency on participants willing to fill out all the questions amid a busy clinical practice. We reached a response rate of 35% on most of the questions and 30% of the surveys was filled out completely. This is comparable to similar surveys conducted on other topics in hand surgery, with response rates of 32% on average, ranging from 19 to 48% *(22-27)*.

Of course, given the small number of members of the Belgian Hand Group this still yields a rather small number in absolute terms, but we can still draw some interesting conclusions, especially with the unique position of having CCH readily available and reimbursed.

CONCLUSION

In an online survey among Belgian hand surgeons, CCH proved to be the preferred treatment option in mild to moderate cases, mainly due to satisfying clinical results for patient and surgeon. In more severe cases, more aggressive surgical techniques would be considered, but an acceptance of the situation could be valid alternative. Compared to the literature, less importance was attached to risk factors for recurrence outside the affected hand and hand therapy was employed less than recommended. Postoperative splinting proved more popular than expected based on the literature, with a general tendency for dorsal nighttime splinting for 7 to 12 weeks, but a wide variety in splinting protocols.

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