Physiotherapy Management of People Diagnosed with de Quervain's Disease: A Case Series

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ABSTRACT

Purpose: To report the outcomes of a physiotherapy management approach for de Quervain's disease (DQD), a common hand disorder for which evidence for physiotherapy management is lacking, in 4 consecutive patients with DQD. **Methods:** Participants underwent a median of eight treatment sessions, consisting of mobilizations with movement, eccentric muscle training, and high-voltage electrical stimulation. Outcomes were assessed with an 11-point numeric pain rating scale (NPRS; range 1–10) and the Disabilities of the Arm, Shoulder and Hand questionnaire (DASH; range 0%–100%). **Results:** Median NPRS and DASH scores decreased from a baseline of 5 and 48, respectively, to 2.8 and 19 after treatment; at 6-month follow-up, all participants reported minimal pain and disability, but one participant required a corticosteroid injection shortly after discharge from physiotherapy. **Conclusions:** Overall outcome was considered successful for three of four patients, comparable to the success rate previously reported for corticosteroid injections. A randomized clinical trial evaluating the efficacy of this intervention seems warranted.

Key Words: de Quervain disease; eccentric exercises, manual therapy.

RÉSUMÉ

Objectif: Présenter les résultats d'une approche de traitement par la physiothérapie de la maladie de De Quervain, une affection de la main courante pour laquelle il y a peu de données probantes quant au traitement par la physiothérapie, chez quatre patients consécutifs ayant la maladie de De Quervain. **Méthodes:** Les participants ont subi une médiane de huit séances de traitement comportant des activités de mobilisation avec mouvements, de contraction musculaire excentrique et de stimulation électrique à haute tension. Les résultats ont été évalués à l'aide d'une échelle numérique de cotation de la douleur à 11 points (1 à 10) et d'un questionnaire sur les déficiences du bras, de l'épaule et de la main (0 à 100%). **Résultats:** Les notes médianes de l'échelle numérique de cotation de la douleur et du questionnaire sur les déficiences du bras, de l'épaule et de la main ont diminué, passant de la note médiane de base de 5/10 et 48/100, respectivement, à 2,8/10 et 19/100 après le traitement; au suivi du 6^e mois, les participants ont déclaré avoir une douleur et une déficience minimales, mais un participant a eu besoin d'une injection de corticostéroïdes peu de temps après la fin du traitement par la physiothérapie. **Conclusions:** Dans l'ensemble, le traitement est considéré comme réussi pour 3 des 4 patients, ce qui est semblable au taux de succès rapporté antérieurement pour les injections de corticostéroïdes. La tenue d'un essai clinique randomisé évaluant l'efficacité de cette intervention semble justifiée.

De Quervain's disease (DQD), characterized by pain and tenderness over the first dorsal compartment,^{1,2} affects between 0.3% and 2.1% of the general population,^{3,4} and it is especially prevalent among people who perform repetitive tasks involving hand twisting or bending.^{5,6} Although DQD is typically managed conservatively, the evidence supporting physiotherapy interventions has mostly been limited to case studies.^{7–11} Mobilization with movement (MWM), which attempts to correct joint positional faults and restore pain-free movement,¹² has been associated with a favourable outcome in a single case study of DQD.⁷ Eccentric strengthening exercises have also been associated with positive outcomes in a

few case reports.^{10,11,13} Although the mechanism behind their effect is unclear, eccentric exercises are thought to stimulate remodelling in degenerated tendons;¹⁴ because the underlying pathological process behind DQD seems to be degenerative,^{1,2} eccentric exercises may prove effective in its management. Finally, although we know of no evidence supporting the use of high-voltage electrical stimulation (HVES) in DQD, we have frequently noticed a favourable response to HVES applied over localized areas of tenderness.

The lack of evidence to support physiotherapy interventions for DQD is reflected in an absence of explicit recommendations for exercise or manual therapy in the

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Table 1 History and Physical Examination Findings of Individual Participants

	1	2	3	4
History				
Age, y	56	50	32	22
Sex	Female	Female	Male	Female
Dominance	Right	Right	Right	Right
Occupation	Typist	Kindergarten teacher	Elementary school teacher	Hairdresser
Complaint	Right radial wrist pain	Right radial wrist pain	Left radial wrist pain	Left radial wrist pain
Aggravating factors	Keyboard use	Carrying groceries, washing face, and cleaning house	Movement (unspecified)	Holding a cup, washing dishes, doing laundry
Onset and mechanism	1 month earlier; no mechanism of injury	6 weeks earlier; no mechanism of injury	6 months earlier; no mechanism of injury; however, 18 months earlier, FOOSH on left hand causing ulnar wrist pain	2 months earlier; no mechanism of injury
Previous treatment	NSAIDs, heat, thumb spica	NSAIDs, thumb spica	None	NSAIDs, thumb spica
Past medical history	HTN, breast cancer	Unremarkable	Unremarkable	Headaches
Physical examination				
Observation	Bony exostosis over radial styloid process	Unremarkable	Bony exostosis over radial styloid process	Unremarkable
Active range of motion	Full; painful wrist flx, ext, UD	Full; pain-free wrist and thumb movement	Full; painful wrist ext., RD, UD	Painful and limited wrist flx, ext; all thumb movements painful and limited
Passive range of motion	WNL	Full, pain-free wrist and thumb	Full, pain-free wrist and thumb	Painful and limited wrist flx, ext; all thumb movements painful and limited
Resisted movement	Painful thumb ext	Painful thumb ext	Painful thumb ext	Not tested
Special tests	+Finkelstein, –grind, –ULTT	+Finkelstein, –grind, –ULTT	+Finkelstein; grind and ULTT not tested	+Finkelstein; grind and ULTT not tested
Tenderness to palpation	Radial styloid process	Tendons of 1st dorsal compartment	Radial styloid process	Tendons of 1st dorsal compartment

FOOSH = fall on an outstretched hand; NSAID = non-steroidal anti-inflammatory drug; HTN = hypertension; flx = flexion; ext = extension; UD = ulnar deviation; RD = radial deviation; WNL = within normal limits; ULTT = upper limb tension test (radial nerve bias).

standard of care for this condition, as described in recently published practice guidelines.¹⁵ This case series, which describes the combined use of exercise and a manual intervention, builds on previous reports^{7,10,11,13} and aims to provide further evidence for the potential benefits of this treatment regimen in an effort to spark further research.

METHODS

Four consecutive patients diagnosed with DQD and referred to Ariel University Physiotherapy Clinic are included in this case series. The study was approved by the Ethical Committee of Ariel University, and all participants gave informed consent for use of their pertinent medical information.

Participant characteristics

Table 1 summarizes participants' demographic characteristics, relevant history, and findings from the physical examination.

Batteson and colleagues¹⁶ devised a screening tool for DQD that consisted of seven items: pain over the radial styloid process, pain with movement, tenderness over the first dorsal compartment, positive Finkelstein test,¹⁷ swelling and thickening over the first dorsal compartment, and pain with resisted thumb extension; the result is considered positive when five or more items are present, with a corresponding sensitivity and specificity of 100%.¹⁶ Because all participants presented with at least five positive items, we were reasonably certain of their diagnosis.

Intervention

Participants were first asked to demonstrate a movement that aggravated their symptoms. The treating therapist (AR) performed a MWM (most often a medial glide of the carpus; see Figure 1) as the participant repeated this movement. If pain decreased or range of motion (ROM) increased, the MWM was repeated for three sets of 10

Figure 1 Medial glide mobilization with movement.

repetitions. If pain or ROM were unchanged, the therapist attempted a different MWM (most often a lateral glide). If another movement reproduced symptoms, this procedure was repeated. After MWM, participants performed an eccentric hammer curl exercise with a resistance band (Theraband, Hygenic Corp., Akron, OH; see Figure 2).

From a position of ulnar deviation, the participant used the uninvolved hand to bring the wrist into radial deviation, then allowed it to rotate back into ulnar deviation using the involved hand only. Participants were encouraged to put enough tension on the resistance band to provoke a moderate level of pain (up to 5 on a numeric pain rating scale [NPRS] ranging from 0 = no pain to 10 = worst pain imaginable) during the exercise. Participants performed three sets of 15 repetitions during each therapy session,^{14,18} initially using a red band and increasing the resistance level once three sets of 15 repetitions were completed with minimal pain.

Finally, participants received 12 minutes of HVES using a 4×2 cm active electrode over the most tender spot of the first dorsal compartment and a similar-sized dispersive electrode over the first metacarpal. We used a 10/10-second on-off cycle with a pulse frequency of 10 Hz and the polarity of the active electrode set to negative. The intensity of the current was gradually raised until the participant reported a painful but tolerable sensation. Participants were encouraged to increase the intensity once adaptation occurred. In addition to treatment provided in the clinic, participants were instructed to perform the eccentric hammer curl exercise for three sets of 15 repetitions twice a day as a home exercise program.

Figure 2 Eccentric hammer curl performed with (a) assisted radial deviation and (b) ulnar deviation controlled eccentrically by radial deviators.

Table 2 Individual Pain (NPRS) and Disability (DASH) Scores throughout Treatment and the Follow-Up Period

Participant	Baseline	Week 1	Week 2	Week 3	Week 4	Week 5	6 Months
NPRS (range 0–10)							
1	6	8	7	6	6	4	0
2	4	1.7	3.7	1	1	D/C	0
3	3	2.3	1.3	NT	NT	2.3	0
4	6	6.7	7.3	NT	4	3.3	0.7
DASH (range 0–100)							
1	48	64	60	62	64	45	9
2	47	28	16	20	6	D/C	0
3	13	13	13	NT	NT	4	0
4	55	60	56	NT	45	32	9

NPRS = Numeric Pain Rating Scale; DASH = Disabilities of the Arm, Shoulder and Hand; D/C = discharged; NT = not tested.

Outcome measures

Our outcome measures were the 11-point NPRS with a minimal detectable change (MDC) and a minimal clinically important difference (MCID) of 2 points^{19,20} and the Disabilities of the Arm, Shoulder and Hand (DASH) questionnaire, which has an MDC of 11 points and an MCID of 15 points.²¹ Both measures were administered at baseline, during each week of therapy, and at follow-up 6 months after discharge. Participants who demonstrated a change beyond the MDC and MCID of the NPRS and DASH were considered to have achieved a successful outcome.

RESULTS

Participants 1, 2, and 3 received 8 treatment sessions, and Participant 4 received 12 sessions. Participants were typically treated twice a week in the clinic. Pain and disability scores throughout the treatment and follow-up periods are summarized in Table 2. Median pain and disability on the NPRS and DASH decreased from 5 and 48, respectively, at baseline to 2.8 and 19 at discharge. At 6 months, all participants reported minimal pain and disability and no recurrence of symptoms. Participants 2, 3, and 4 fully complied with their home exercise program for at least 2 months after discharge and sought no further treatment during follow-up. Patient 1 did not comply with her home exercise program and received a corticosteroid injection shortly after discharge.

DISCUSSION

Three of our four participants experienced a successful outcome after intervention. Participants 2 and 4 reported pain and disability reductions beyond the MDC and MCID of the NPRS and DASH; because they also reported minimal pain or disability at 6-month follow-up, we consider their overall outcomes successful. Although the change in Participant 3's disability did not reach the MDC or MCID of the DASH, it did exceed a 50% threshold; given the low level of disability reported by Participant 3 at baseline, the chronic nature of his symptoms, and the lack of pain or disability he reported at

6-month follow-up, we consider his overall outcome successful as well. Participant 1's level of disability was practically unchanged between baseline and discharge, and she required a corticosteroid injection shortly after discharge. We therefore consider her treatment outcome a failure.

To our knowledge, this is the largest case series describing physiotherapy management of DQD. Our results compare favourably with those of another case series describing treatment with sclerosing polidocanol injection and eccentric exercises.¹³ Also, none of our participants experienced a recurrence during the follow-up period. Together, these findings suggest that a combined approach of eccentric exercise and MWM may be a viable first-line treatment option for DQD.

Although participants typically reported immediate pain relief during and immediately after the application of MWM, their weekly pain and disability scores decreased gradually. Nevertheless, because of its pain-relieving effect, MWM may facilitate a greater application of force during eccentric exercises, which seems to be beneficial, because greater loads during these exercises have been associated with better outcomes.²²

Interestingly, different eccentric exercises have been associated with positive outcomes in DQD.^{10,11,13} It may be that different eccentric exercises can be effective as long as an adequate load is transmitted to the tendons of the first dorsal compartment. We prefer the hammer curl, which readily reproduces the pain associated with DQD—an important consideration because a greater pain response during eccentric exercises has also been associated with better outcomes.²²

LIMITATIONS

Our study has several limitations. First, as with any case series, we were not able to establish a causal relationship between intervention and outcome. Second, deciphering the individual contribution that each treatment component made to the final outcome is impossible. Finally, imaging was not used in diagnosis; it is important to

note, however, that DQD is often diagnosed on the basis of clinical examination alone.

CONCLUSIONS

A multi-modal physiotherapy treatment resulted in a successful outcome in three of four people with DQD. This treatment protocol may represent a viable line of conservative care with fewer risks than corticosteroid injections. A randomized controlled trial to assess the efficacy of this treatment seems warranted.

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