



# Clinical Case Report Competition

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First Place Winner

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Manual lymph drainage and therapeutic massage in  
treatment of a professional violinist

# MANUAL LYMPH DRAINAGE AND THERAPEUTIC MASSAGE IN TREATMENT OF A CLASSICAL VIOLINIST

## Abstract

The objective of this study was to determine whether a combination of therapeutic massage modalities and manual lymph drainage could ease symptoms of playing-related musculoskeletal disorder in a professional classical violinist. The patient, a 26-year-old Caucasian female, complained of stiffness, heaviness, and morning swelling in her overworked fingering (left) hand. She tested positive for several special tests for thoracic outlet syndrome and nerve entrapment pathologies, as consistent with existing literature regarding common injuries in professional musicians. A strict treatment protocol was employed over the course of ten treatments in order to minimize variability. Therapeutic massage techniques were applied first; each treatment closed with MLD to the neck and the left arm, following the protocol established by the Dr Vodder school. All treatment was applied bilaterally with the exception of MLD treatment of the arm, which was applied only to the left side. After 10 treatments the patient noted a complete resolution of her symptoms. However, the study was not sufficiently sensitive to determine which effects could be attributed to therapeutic massage techniques, and which could be attributed to MLD. Therefore the results, while promising, indicate the need for much more extensive studies before any major conclusions can be drawn.

*Key words:* musician, nerve entrapment, manual lymph drainage

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## **Introduction**

Professional musicians are highly susceptible to performance- or practice-related injury, including musculoskeletal pathologies, peripheral neuropathies, and other issues that can fall under the general umbrella of "overuse syndromes" (Rardin, 2007, p. 2). In particular, violinists have been shown to be very likely to be diagnosed with thoracic outlet syndrome (Hoppmann, 2001, p. 619), carpal tunnel syndrome (Ledermann, 2006, p. 761), or ulnar nerve neuropathy (ibid) throughout the course of their professional careers. There is also mounting evidence that psychosocial factors, such as the stress of auditioning for an orchestra or playing in front of an audience, can have a role in the development of playing-related injuries (Bird et al, 2007, p. 349).

While manual lymph drainage has been shown by a few studies to be successful in the treatment of sports-related injuries (Vairo et al, 2009, pp 80-81), this research does not yet appear to be extensive, nor has it yet been applied to the type of chronic pain often manifested by professional musicians. By combining massage techniques with manual lymph drainage therapy, this paper aims to make a contribution towards determining whether such an approach could help not only professional musicians, but other professionals who may have suffered long-term, chronic tissue damage due to work, hobbies, and recreational activities. The present study will examine the question: Can a combination of manual lymph drainage and therapeutic massage improve practice and performance ability and comfort in a professional violinist?

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### **The Patient: Case History**

The patient was a 26-year-old Caucasian female classical violinist who has been playing since the age of three. She estimated that on an average day she practices the violin for approximately three hours per day; this amount increases before a performance or an audition, to a maximum of six hours per day. She has prescriptions for Effexor XR and Cyclen to deal with a doctor-diagnosed anxiety disorder. She has been taking both of these medications for ten years.

The patient complained that, on starting practice each day, she noted significant tension in her left hand and forearm, as well as a feeling of "clumsiness" and "heaviness" in the same hand. She described the extensor surface of her left forearm feeling extremely tight; shifting up and down the finger board of the violin was difficult and presented with an uncomfortable sensation of tightness and pulling, especially if she tried to practice or play early in the morning. She had often tried running her hands under hot water before she started playing in an attempt to warm up the muscles, but she found this ineffective.

The patient also complained that her left hand often fell asleep during practice, with the resulting pins-and-needles sensation taking several minutes to resolve. Her arms and hands also experienced numbness and tingling on a nightly basis, waking her from sleep at least two or three times every night. She did not note any feelings of weakness or reduced sensation in her fingers, hands, wrists, arms, or elbows.

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## **Initial Testing and Assessment**

A wide variety of special tests and other forms of measurement were employed in the course of this study, in the interests of determining contributing factors to the patient's condition as closely as possible.

To gather subjective data from the patient's point of view, this study employed the DASH (Disabilities of the Arm, Shoulder, and Hand) questionnaire. This questionnaire was chosen not only because it addresses the area of the body on which this study focused, but in large part because it includes a special addendum for musicians that addresses any pain or other symptoms they experience that are related to practice and performance.

As thoracic outlet syndrome (TOS) is among the most commonly reported source of complaints among string instrument players (Roper, 2009, p. 6) , a variety of TOS tests was employed to determine the involvement of the scalenes, pectoralis minor muscles, potential cervical ribs, and entrapment at the costoclavicular space. These tests, which include the Adson maneuver, Halstead maneuver, costoclavicular/military brace test, and Wright's hyperabduction test, are not considered to have a high degree of reliability. The tests must produce not only a decreased pulse, but also a reproduction of the client's symptoms, to be considered positive. TOS is thus usually considered a diagnosis of exclusion of other causes (Magee, 2008, p. 320).

Upper limb tension tests, employed to investigate entrapment of the four major nerves in the arm and forearm, are considered to have low intertester reliability but high intratester reliability (Vanti et al, 2010). They are generally considered valid in determining tension in upper limb neural connective tissue (Ellenbecker and Mattalino,

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1997).

Other special testing was employed to rule out the possibility of carpal tunnel syndrome, pronator teres syndrome, insufficient blood supply to the hands, or facet compression in the neck. All of these tests were negative.

Initial assessment of the patient revealed the following specific findings.

- The costoclavicular test, also known as the military posture test, produced a highly diminished radial pulse and a strong recreation of neurological symptoms (numbness and tingling) on the patient's left side. This indicated possible entrapment of the brachial plexus in the costoclavicular space.
- Wright's hyperabduction test produced strongly diminished radial pulses and recreated neurological symptoms in both the right and left arms, indicating possible entrapment of the brachial plexus under hypertoned pectoralis minor muscles.
- Upper limb tension tests (ULLT) were employed to further investigate symptoms more locally in the arms. ULLT #1 (median nerve) produced minor recreation of neurological symptoms in the left arm. ULLT #2 (median/musculocutaneous nerve) and #3 (radial nerve) tested negative bilaterally. ULLT #4 (ulnar nerve) produced major recreation of neurological symptoms in the left arm, indicating entrapment of the ulnar nerve at one or more points along its course.
- The DASH questionnaire indicated that the patient does not experience great discomfort or disability in her activities of daily living. Her total score for Part I of the questionnaire was 10/100. The only activities she indicated difficulty with

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in this area involved heavy lifting or otherwise intensive physical work with her arms.

### **Treatment Protocol**

A strict treatment protocol of therapeutic massage and MLD techniques was followed over the course of ten treatments in order to minimize variability between sessions. Massage techniques such as myofascial release, petrissage, stroking, and muscle squeezing were employed first; each treatment closed with MLD to the neck and the left arm. All treatment was applied bilaterally with the exception of MLD treatment of the arm, which was applied only to the left side.

#### **Therapeutic Massage treatment**

- 10 axillary pumps
- myofascial treatment: stack and load 3 times in 3 planes of movement, or until no further resistance is met
  - upper trapezius
  - pectoralis major
  - clavicular mobilization
  - pectoralis minor
  - coracobrachialis
  - flexor carpi ulnaris
  - forearm extensors
  - fascial shearing to tunnel of Guyon
- Swedish, petrissage, and other therapeutic treatment: each stroke applied 3 times
  - upper trapezius: muscle squeezing, knuckle and fingertip kneading
  - pectoralis major: palmar and fingertip kneading
  - pectoralis minor: muscle stripping, pin and stretch
  - sternocleidomastoid: myofascial release; neuromuscular therapy
  - splenius capitis and semispinalis capitis: fingertip kneading
  - scalene group: fascial release, kneading, muscle stripping, attachment frictions, stretching
  - general Swedish to lateral and posterior neck to clear
  - deltoids and coracobrachialis: scooping, muscle squeezing, kneading
  - forearm extensors: dynamic stroking, pin and stretch, fingertip and elbow kneading

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- flexor carpi ulnaris: picking up, kneading, dynamic stroking
- intrinsic hand muscles: kneading, muscle stripping to hypothenar eminence
- general Swedish to forearm and arm to clear

MLD was then applied to the neck and the left arm, following the protocol set out by the Dr Vodder School of Manual Lymph Drainage.

To supplement the massage therapy sessions, the patient was asked to perform daily stretches for the forearm extensors, as well as daily contrast baths to the forearms.

### Results

After five treatments had been completed, the patient was reassessed. All tests that had been employed in the initial assessment were repeated and the patient completed a second DASH questionnaire. After her final treatment, a complete reassessment of the patient was conducted once again. All tests that had been employed in the initial assessment were repeated and the patient completed a third DASH questionnaire.

The special testing that was conducted at the initial intake, the mid-term reassessment, and the final reassessment is here presented in table form in order to more easily compare the evolution of results. Only those tests that initially presented with a positive result are shown.

*Table 1: Comparative Results of Special Testing*

| Test Name       | Initial Intake   | Mid-Term Reassessment | Final Reassessment   |
|-----------------|--|-----------------------|----------------------|
| Adson's test    | diminished radial pulse on right side with no neurological symptoms; negative on left side | negative bilaterally  | negative bilaterally |
| Halstead's test | diminished radial pulse on left side with no   | negative bilaterally  | negative bilaterally |

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|                              |  |  |  |
|------------------------------|--|--|--|
|                              | neurological symptoms;<br>negative on right side   |  |  |
| Costoclavicular test         | diminished radial pulse and recreated neurological symptoms on left side; negative on right side | negative bilaterally   | negative bilaterally   |
| Wright's hyperabduction test | diminished radial pulse and recreated neurological symptoms bilaterally                          | diminished radial pulse on left side with no neurological symptoms; negative on right side | diminished radial pulse on left side with no neurological symptoms; negative on right side |
| ULLT #1 (median nerve)       | mild positive on left side; negative on right side   | negative bilaterally   | negative bilaterally   |
| ULLT #4 (ulnar nerve)        | strong positive on left side; negative on right side   | mild positive on left side; negative on right side   | negative bilaterally   |

The patient also completed a third and final DASH questionnaire. In the first module on daily activities, she did not answer any of the questions above a 1 out of 5, rendering her total score in this area 0/100. Notably, the same held true for the performing arts module, where a further lack of any ratings above a 1 out of 5 also resulted in a score of 0/100.

*Table 2: Comparative Results of DASH questionnaire*

|                         | <b>Initial Assessment</b> | <b>Mid-Term Reassessment</b> | <b>Final Reassessment</b> |
|-------------------------|---------------------------|------------------------------|---------------------------|
| <b>Daily Activities</b> | 10/100                    | 7.5/100                      | 0/100                     |
| <b>Performing Arts</b>  | 50/100                    | 31.5/100                     | 0/100                     |

In addition, the patient indicated that she had practiced for two hours on the morning of the final treatment and assessment. Where she had previously found that it often took an hour or more for her left hand to feel properly warmed up and able to function at the level she desired, on this day she noted that playing was comfortable from the very beginning of her practice session. She noted that the night-time sensation

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of pins and needles in her hands, which had previously awoken her two to three times a night, had not occurred in over a week. She indicated excitement at being able to play easily and without concern for how long it would take her hand to sufficiently warm up.

### **Discussion**

The treatment protocol employed resulted in a major decrease in the patient's signs and symptoms; after ten treatments, the patient noted a near-complete resolution of her complaints.

The patient indicated that she found the MLD portion of the treatments to be extremely relaxing and that she slept better on nights when she received this treatment. This seems to support the assertion that MLD has a calming effect on the sympathetic nervous system (Rattray and Ludwig 2000: 35). The patient also reported that she no longer perceived a feeling of "heaviness" in her fingering hand and arm when she began her practice sessions. This suggests that fluid movement through this arm may have been improved through the application of MLD.

The patient initially tested mildly positive for median nerve entrapment and strongly positive for ulnar nerve entrapment. She also reported numbness and tingling in her hands that would wake her up two to three times every night. The resolution of these symptoms, both during instrument practice and during sleep, suggests that they were sufficiently released over the course of treatment. The resolution of the special tests for thoracic outlet syndrome that initially presented as positive, in particular the strong positives produced by the costoclavicular and Wright's hyperabduction tests, suggests that focusing on the patient's pectoralis minor muscles, clavicular area, and

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fascia and muscles of the left arm and forearm was beneficial.

At the initial intake, the patient complained of a feeling of tightness and pulling in her left forearm extensors. The resolution of these sensations also indicates that the treatment, combined with the assigned homecare, brought new plastic length and a reduction in adhesions to this muscle group, enabling the patient to play more comfortably.

### **Study Drawbacks and Further Research**

For the purposes of this study, a combination of MLD and therapeutic massage was chosen in order to address the patient's complaints of pain, tightness, and a sensation of overwork in her left, or fingering, hand. The choice to combine these techniques was based on the existing research, which indicated a gap to be filled between overwork due to sports injuries and overwork in a musician's playing-related activities. To clearly determine what techniques had which effects on the patient, separate studies on these techniques need to be conducted.

Although there is much clinical experience suggesting that the use of MLD is beneficial, there remains a great deal of research to be done in order to conclusively support its use outside of treating major lymphoedemas (Lymphoedema Framework, 2006, p. 29). Similarly, no ideal frequency or length of treatment for the use of MLD has been definitively established, although the Lymphoedema Framework document from the Dr Vodder School of lymphatic drainage suggests it may be conducted up to twice daily, or three times per week (p. 30). It was originally intended, in order to more accurately measure the effects of MLD, to conduct all of the treatments for this patient

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over four weeks, with at least three treatments per week. Unfortunately, due to the patient's schedule, this did not prove to be possible. Should future studies be undertaken, this variable of the time between treatments should ideally be more closely controlled.

Overall, more research on the use of MLD in overuse injuries, whether they be from sports, musical instruments, or other work or hobbies, is definitely required. The literature is currently heavily weighted toward the use of MLD in the treatment of lymphoedema, where it has been shown to have excellent benefits. Some scant literature addresses the use of lymphatic drainage techniques in addressing overwork injuries suffered in sports activities. The possibilities of broadening its scope to treat more common, possibly less traumatic, musculoskeletal injuries are exciting, and as yet have been barely touched upon.

As noted above, previous research has commented on the likely connection between playing-related musculoskeletal disorder and the development of anxiety disorders, likely connected to the stresses associated with auditioning, performing, or even playing the wrong note. Determining such associations is likely out of the scope of practice of future massage therapy studies; however, the link between an overly active sympathetic nervous system and the calming effects of manual lymph drainage on this same system are encouraging, and should be examined further.

In conclusion, this study contributes little more than to point out the tremendous amount of further research that remains to be done. However, the unveiling of new questions is a valuable endeavour in itself, and admits to new horizons waiting to be explored.

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References

- Bird, H., Maclver, H., & Smyth, G. (2007). Occupational Disorders; Non-Specific Forearm Pain. *Best Practice & Research Clinical Rheumatology*, 21:2, 349-365.
- Ekici, G., Bakar, Y., Akbay, T., & Yukcel, I. (2009). Comparison of Manual Lymph Drainage Therapy and Connective Tissue Massage in Women with Fibromyalgia: A Randomized Controlled Trial. *Journal of Manipulative and Physiological Therapeutics*, 32:2, 127-133.
- Fry, H.J.H. (1988). The treatment of overuse syndrome in musicians. Results in 175 patients. *Journal of the Royal Society of Medicine*, 81, 572-575.
- Gibson, J. & Williams, J. (2012). Fractured phalanx in a violinist's finger: Special considerations in treating musician patients. *Dalhousie Medical Journal*, 36:2, 8-11.
- Guptill, C. & Golem, M.B. (2008). Case Study: Musicians' Playing Related Injuries. *Work*, 30:3, 307-310.
- Hoppmann, R.A. (2001). Instrumental Musicians' Hazards. *Occupational Medicine*, 16:4, 619-631.
- Institute for Work and Health (2006). Disabilities of the arm, shoulder, and hand: The DASH questionnaire. Retrieved from [www.dash.iwh.on.ca/system/files/dash\\_questionnaire\\_2010.pdf](http://www.dash.iwh.on.ca/system/files/dash_questionnaire_2010.pdf)
- Kohonen, M., Teerenhovi, O., Terho, T., Laurikka, J., & Tarkka, M. (December 2007). Is the Allen test reliable enough? *European Journal of Cardiothoracic Surgery*, 32:6, 902-905.

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- Kuschner, S.H., Ebramzadeh, E., Johnson, D., Brien, W.W., & Sherman, R. (1992).  
Tinel's sign and Phalen's test in carpal tunnel syndrome. *Orthopedics*, 15, 1297-1302.
- Lederman, R.J. (2006). Focal peripheral neuropathies in instrumental musicians.  
*Physical Medicine and Rehabilitation Clinics of North America*, 17, 761-779.
- Lymphoedema Framework (2006). *Best Practice for the Management of Lymphoedema*.  
International Consensus MEP Ltd, London.
- Maffulli, N. & Maffulli, F. (1991). Transient entrapment neuropathy of the posterior  
interosseous nerve in violin players. *Journal of Neurology, Neurosurgery, and  
Psychiatry*, 54, 65-67.
- Magee, D.J. (2008). *Orthopedic Physical Assessment*. Saunders Elsevier, Missouri.
- Nelson, D., Lieberman, D., & Kiener, J. (2008). Massage for musicians: Linking  
instruments to injuries." *Journal of Massage and Bodywork*, January/February,  
82-91.
- Priganc, V.W. & Henry, S.M. (2003). The relationship among five common carpal  
tunnel syndrome tests and the severity of carpal tunnel syndrome." *Journal of  
Hand Therapy*, 16:3, 225-236.
- Rardin, M.A. (2007). *The Effects of an Injury Prevention Intervention on Playing-  
Related Pain*. ProQuest Information and Learning, Ann Arbor, MI.
- Rattray, F. & Ludwig, L. (2000). *Clinical Massage Therapy: Understanding, Assessing,  
and Treating Over 70 Conditions*. Talus Incorporated: Elora, ON.
- Roper, Emily (2009). A narrative review of common injuries found in adult professional  
musicians." British School of Osteopathy, n.p.

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Ruengsakulrach, P., Brooks, M., Hare, D.L., Gordon, I., & Buxton, B.F. (2001).

Preoperative assessment of hand circulation by means of Doppler  
ultrasonography and the modified Allen test." *Journal of Thoracic  
Cardiovascular Surgery*, 121:3, 526-531.

Vairo, G.L., Miller, J.S., McBrier, N.M., & Buckley, W.E. (2009). Systematic review of  
efficacy for manual lymphatic drainage techniques in sports medicine and  
rehabilitation. *Journal of Manual and Manipulative Therapy*, 17:3, 80-89.

Vanti, C., Conteddu, L., Guccione, A., Morsillo, F., Parazza, S., Carlotta, V.; & Paolo, P.  
(2010). The upper limb neurodynamic test: Intra- and intertester reliability and  
the effect of several repetitions on pain and resistance. *Journal of Manipulative  
and Physiological Therapeutics*, 33:4, 292-299.