PREVENTION AND MANAGEMENT OF TRAPEZIOMETACARPAL JOINT PAIN

Anne E Wajon, BAppSc (Cumb), MAppSc (USyd)

Thesis presented for the degree of

Doctor of Philosophy

The University of Sydney

2005

SUPERVISOR'S CERTIFICATE

This is to certify that the thesis entitled "*Prevention and management of trapeziometacarpal joint pain*" submitted by Anne Wajon in fulfilment of the requirements for the degree of Doctor of Philosophy (Physiotherapy) is in a form ready for examination.

Signed _____

Date _____

Dr Louise Ada
School of Physiotherapy,
Faculty of Health Sciences,
The University of Sydney.

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ABSTRACT

The aim of the studies reported in this project was to examine factors associated with the prevention and management of trapeziometacarpal osteoarthritis, both in musculoskeletal physiotherapists and the general patient population.

Two studies were undertaken to investigate factors associated with the aggravation of thumb pain in musculoskeletal physiotherapists. Study 1 was a survey of the prevalence of thumb pain, and allowed determination of the most aggravating spinal manipulative therapy technique. It identified that 83% of respondents complained of an aggravation of thumb pain due to the performance of spinal manipulative therapy techniques, with 85-87% of the painful respondents complaining of thumb pain aggravated by unilateral and central PA glides. Study 2 was conducted to determine whether the alignment of the joints of the thumb during performance of these glides was associated with thumb pain. This observational study of 129 musculoskeletal physiotherapists performing a PA glide identified that aligning the metacarpophalangeal and interphalangeal joints in extension was associated with a lower prevalence of work-related thumb pain. Therefore, it is suggested that musculoskeletal physiotherapists be taught to perform these techniques with the joints of their thumb in extension in an effort to reduce the development of work-related thumb pain. Furthermore, it is suggested that those who are unable to maintain this alignment voluntarily be provided with a thermoplastic thumb splint to maintain the extended alignment.

Two studies were undertaken to investigate the conservative and surgical management of

patients with trapeziometacarpal osteoarthritis. Study 3 was a randomised controlled trial conducted to compare the efficacy of a new thumb strap splint and an abduction exercise regimen against the standard approach to conservative management of trapeziometacarpal osteoarthritis, namely a short opponens splint and pinch exercise regimen. While there was no additional benefit of one approach over the other, all participants improved in the outcomes of pain, strength and hand function over the six-week period of intervention. Nevertheless, some people find that symptom relief from conservative intervention is inadequate and short-lived, requesting surgery for the treatment of disabling and persistent pain from trapeziometacarpal osteoarthritis. Study 4 was a systematic review, conducted to determine evidence of efficacy of one surgical procedure over another. This review identified six randomised controlled trials of surgery for trapeziometacarpal osteoarthritis. While there was evidence of no difference in the reduction in weakness between the procedures, there was insufficient evidence to confirm that there was no difference in the outcomes of pain, contracture, hand function, or patient global assessment. Furthermore, there was sufficient evidence to conclude that trapeziectomy had significantly fewer adverse effects, and trapeziectomy with ligament reconstruction and tendon interposition (LRTI) had significantly more, when compared with the other procedures analysed in this review. It is suggested that the decision as to which intervention is most appropriate for a given patient be based upon the individual patient's requirements, the extent of disease, and the demands placed upon the joint by domestic duties, work, leisure and recreational activities.

The studies presented in this project assist in formulating preventative and management

strategies for people with trapeziometacarpal osteoarthritis.

I, **Anne Wajon**, hereby declare that the work contained within this thesis is my own and has not been submitted to any other university or institution as a part or a whole requirement for any higher degree.

I, **Anne Wajon**, hereby declare that I was the principal researcher of all work included in this thesis, including work published with multiple authors.

In addition, ethical approval from the University of Sydney Human Ethics Committee was granted for the studies presented in this thesis. Participants were required to read a participant information document and informed consent was gained prior to data collection.

Name ANNE E WAJON

Signed _____

Date _____

Parts of the work presented in this thesis have been published and/or presented in the following forums:

PUBLICATIONS

Wajon A (2000): The thumb 'strap splint' for dynamic instability of the trapeziometacarpal joint. *Journal of Hand Therapy* 13:236-237.

Wajon A, Ada L (2001) Prevalence of pain in the thumbs of manipulative physiotherapists. *MPA News* 36:7.

Wajon A, Ada L (2003): Prevalence of thumb pain in physical therapists practicing spinal manipulative therapy. *Journal of Hand Therapy* 16:237-244.

Wajon A, Ada L, Edmunds I (2004): Surgery for thumb (trapeziometacarpal joint) osteoarthritis [Cochrane Protocol] *The Cochrane Database of Systematic Reviews*, Issue 1. Art. No.: CD004631. DOI: 10.1002/14651858.CD004631.

Wajon A, Ada L (2005): No difference between two splint and exercise regimens for people with osteoarthritis of the thumb: a randomised controlled trial. *Australian Journal of Physiotherapy* 51: 245-249.

Wajon A, Ada L, Refshauge K (in press): Work-related thumb pain in physiotherapists is associated with thumb alignment during performance of PA glides. *Manual Therapy* Accepted 11/8/05.

Wajon A, Ada L, & Edmunds I (2005) Surgery for thumb (trapeziometacarpal joint) osteoarthritis [Cochrane Review]. In *The Cochrane Library,* Issue 4, John Wiley & Sons, Ltd.: Chichester, UK.

PRESENTATIONS

1998 Enhancing trapeziometacarpal stability – can it delay development of osteoarthritis in patients with painful hypermobility?
AHTA Conference and AGM, Perth WA
Awarded Jill Chapman award for best clinical paper

1998 Enhancing Trapeziometacarpal Stability
NSW Hand Surgery Association Annual Scientific and General Meeting
Leura, Blue Mountains NSW

2002 A randomised, controlled trial of the efficacy of a new splint and exercise program for people with osteoarthritis of the thumb
VIIth International Physiotherapy Congress, Sydney, NSW

2002 A randomised, controlled trial of the efficacy of a new splint and exercise program for people with osteoarthritis of the thumb

NSW Hand Surgery Association, Annual General Meeting, Terrigal, NSW

Awarded best scientific paper

2003 Efficacy of a splint and exercise program for people with osteoarthritis of the thumb: a randomised controlled trial

Trans-Tasman Hand Therapy Conference, Queenstown, NZ

2003 Prevalence of thumb pain in physiotherapists practicing spinal manipulative therapy

MPA 13th Biennial Conference, Convention Centre, Sydney

2004 Surgery for trapeziometacarpal joint osteoarthritis: undertaking a Cochrane Collaboration systematic review

NSW Hand Surgery Association Annual Conference, Canberra, ACT

ACKNOWLEDGMENTS

I would like to extend my sincere thanks and appreciation to my supervisor, Dr Louise Ada, for her expert guidance and encouragement throughout my Doctoral candidature. She has patiently guided me through this complex process. I would also like to thank the other members of the staff in the *School of Physiotherapy* who have provided editorial assistance, practical support and encouragement. In particular, I am indebted to Roger Adams for his simple advice and statistical support throughout the various studies.

The staff at *Hornsby Hand Centre* have been particularly understanding and tolerant with the demands of my candidature, and assisted in the undertaking of my clinical trial. In particular, I would like to thank Gail Farr for screening patients, and Teresa Butler, Libby Kilian and Christine Reed for assisting with the data collection for Study 3. Further, I would like to thank Dr Ian Edmunds for Staging the X rays for the clinical trial, and for his commitment to, and involvement in, undertaking the systematic review. His surgical input was invaluable.

I am also indebted to the participants of the studies. I appreciate the involvement of the musculoskeletal physiotherapists who responded to the survey in Study 1, and those who were prepared to have their thumbs photographed while performing a PA glide in Study 2. Likewise, I appreciate the commitment of the participants for Study 3, who wore their splints and performed their exercises as instructed and attended for regular measurements.

I am also grateful to thank Jenny Crane from Surgical Synergies for supplying and helping with the set-up of the Biometrics force plate for Study 2, and Drs Tim Davis and Magnus Tagil for providing further information about the participants of their surgical trials, which was helpful in completing the systematic review in Study 4.

This thesis is dedicated to my husband, Paul Wajon, and our children, Sally and Yvette. Paul has tirelessly supported me throughout this project, and allowed me to devote my spare time to its completion. Similarly, my children Sally and Yvette have always understood my desire to study and in the process, become independent learners themselves. I could not have completed it without their love and support.