STANDARDIZED DIAGNOSIS ?

How to speak a uniform language ?

Cyriax Assessment Form ?

De Coninck S., "Klinische Untersuchung der Shulter : sprechen Therapeuten die gleiche Sprache ?, Krankengymnastik – Zeitschrift für PT, 52, 8/2000, p1358-1364

Giuseppe R.-Festa N., "Accordo diagnostico nella valutazione della spalla secondo Cyriax con le Cyriax Assessment Forms", Terapia Manuale & Riabilitazione, 2.4, 2000, p35-38

Mechanism capsular pattern

- Acute cases
  - Muscles contract in a way that anticipates the situation that might be created when later the capsule "contracts"
    - Protective mechanism
  - So, there is an in-built mechanism in the brain which acts in imitation or in correspondence with the normal evolution of the movement
- Chronic
  - Fibrous contracture

Ombregt L., "A system of Orthopaedic Medicine", 3rd edition, Elsevier 2013, p76

Research...?

- Ellis R.M., ***"Cyriax's passive motion tests"***, Phys Ther 1995 mar 75(3) : 239-40

- Fritz J.M. et al., ***"An examination of the selective tissue tension scheme with evidence for the concept of a capsular pattern in the knee"***, Phys Ther 1998 Oct 78(10):1046-56

- Bijl D. et al, ***"Validity of Cyriax's concept capsular pattern for the diagnosis of osteoarthritis of hip and/or knee",*** Scand J Rheumatol 1998, 27(5):347-351

- Hayes K.W. et al, ***"An examination of Cyriax's passive motion tests with patients having osteoarthritis of the knee",*** Phys Ther 1994 Aug74(8):697-707

Research support is sometimes mixed ?

- Pellechia et al. (1996)
  - Shoulder : highly reliable
- Fritz et al. (1998)
  - Knee : evidence to support the concept ot CP in the inflamed or arthritic knee

- Bijl et al. (1998)
  - Knee : unable to recommend it as a valid test
- Bijl (1998), Klassbo et al. (2003), Sims (1999)
  - Hip : no support for the CP

- Petersen Ch. M. et al., ***"Construct validity of Cyriax's selective tension examination : association of end-feels with pain at the knee and shoulder",*** J Orthop Sports Phys Ther – Vol 30, nr. 9, 2000, p512-527
  - Inconclusive / value of end feel is discussed ?
- Pellecchia G.L. et al., ***"Intertester reliability of the cyriax evaluation in assessing patients with shoulder pain"***, J Orthop Sports Phys Ther 1996 Jan 23(1), 34-38
  - Highly reliable, kappa factor 0.87

Cause of tendinopathy ?

- *Former hypothesis*
  - Degeneration collagen tissue
  - Neo- and hypervascularisation
    - Ingrowth new vessels / nervs
  - Sclerosing the new vessels ? Less pain ?
    - Theory is now contested !

- *Recent hypothesis*
  - Changes in intra-tendon pressure seems to be pain producing (kind of "compartment syndrome")
  - Cleaving the tendon (surgery) affords relief

    - → Research Prof Dr L. Vanden Bossche, MD, Ugent, 2014

Principles of treatment for muscles and ligaments

- Rest is not always favourable
- the post-traumatic inflammatory reaction should be abated
  - Stearns 1940, Burri et al. 1978, Akeson et al. 1980, Smillie IS 1978, Donatelli R et al, Evans P 1980 (lig. and capsule)
  - Matthiass AH 1966, Cotta H. 1976, Dustmann HO 1971, Giucciardi E 1967, Sood SC 1971, Videmant 1987 (cartilage)
  - Gerber CH et al. 1980, Appell HJ 1990, Cooper RR 1972, Järvinen M 1976 (muscular)

- ***"Exercise appears to be the best modality ; most of the machines that plug into the wall are acting as flashy placebos"*** (Clarke 1999)

- ligamentous and tendinous lesions : stronger connective tissue with mobilisation versus immobilisation
  - Tipton CM et al. 1975, Tittel K. 1973, Erikson E. 1976, Ehricht HG 1978

Deep transverse massage

- Effects :
  - ***traumatic hyperaemia***
  - ***movement : prevention of adhesions***
  - ***reduction of pain***
- Indications :
  - muscle, tendinous and ligamentous lesions

- **Inflammation – repair – remodelling phase**
  - **Better alignment of fibres and tensile strength**
  - **Maintain normal connective tissue mobility**

- Internal and external mechanical stress applied to the repair tissue
  - = main stimulus for remodelling immature and weak scar tissue
  - With fibres orientated in all directions, through several planes, into linearly rearranged bundles of connective tissue

Hardy, MA, The biology of scar formation. Phys Ther 1989; 69:1014–1023

- Recent studies using light microscopy, electron microscopy and immunoelectron microscopy have shown that ***after friction massage there is fibroblastic proliferation and realignment of collagen fibers***

  - Davidson CJ, Ganion LR, Gehlsen GM, et al. Rat ***tendon morphologic and functional changes resulting from soft tissue mobilization***. *Medicine and Science in Sports and Exercise* 1997;29(3):313-319.

- They believe that friction massage causes a microtrauma to an area of excessive soft tissue fibrosis or scar. They state: ***"The micro-injury causes microvascular trauma and capillary hemorrhage, resulting in a localized inflammatory response which serves as the stimulus for the body's healing cascade and immune/reparative system."*** The fibroblastic proliferation is responsible for the repair and regeneration of collagen, since fibroblasts produce fibronectin and synthesize collagen.

- Roush MB, Miller KW, Stover SA, et al. ***Augmented soft tissue mobilization in the treatment of chronic achilles tendinitis***. Muncie, IN: Performance Dynamics, Research Binder, 1998.

- A study by Gehlsen et al. demonstrated that the fibroblastic proliferation was directly dependent upon the magnitude of the applied pressure by their instrument

  - Gehlsen GM, Ganion LR, Helfst R. ***Effects of pressure variations on tendon healing***. Muncie, IN: Performance Dynamics, Research Binder, 1998.

- Brosseau et al. ***"deep transverse friction massage for treating tendinitis",*** Cochrane database Syst Rev 2002, (4), CD003528. Review

- Chamberlain G. ***"Cyriax friction massage : a review",*** J Orthop Sport Phys Ther 4:16-22, 1982

- De Bruijn R., ***"Deep transverse friction : its antalgic effect"*** International Journal of Sports Medicine, 5:35-36, 1984

- De Coninck S-Meeus K. ***"Is it possible to use friction massage as a differential diagnostic medium : a test-retest experimental study",*** 2005, online publication – presentation Physiokongress Aachen 2006

- Schwellnus M.P. et al., ***"Deep transverse frictions in the treatment of the iliotibial band friction syndrome in athletes : a clinical trial"***, Physiotherapy, august 1992, vol 78 nr8

- Walker H., ***"Deep transverse frictions in ligament healing"***, J Orthop Sports Phys Ther 6(2):89-94, 1984

- Dolunay E., ***"the effect of transverse friction massage in physiotherapy and rehabilitation of shoulder impingement syndrome",*** Ankary Univ, Dikimevi Journal of the School of health care professions, vol 7, Nr 1, june 2005, p11

Joseph Michael F. et al, ***"Deep friction massage to treat tendinopathy : a systematic review of a classic treatment in the face of a new paradigm of understanding",*** Journal of Sport Rehabilitation, 2012, 21, 343-353

"The analysis of articles revealed evidence for the incorporation of DTM in the treatment of tendinopathy. Comparison of studies was made difficult by the varied location of tendinopathies, confounding cotreatments in comparison groups, and varied outcome measures used.

Much of the original rationale for the use of DFM remains valid in light of a complete shift in understanding of the pathogenesis of tendinopathy.

Future randomized comparison studies are necessary that incorporate true control groups and compare DFM in isolation with other modes of treatment.

Studies such as these are very difficult to undertake, as they inherently deny treatment to a group of participants."

Deep friction : effects?

- Christie W. et al. :"*Cross-frictional therapy and stretching for the treatment of palmar adhesions due to Depuytren's contracture : a prospective case study*", Manual Therapy 17 (oct 2012), 479-482

  - …removal of adhesions by DF…
    - DF enhances the proliferation of extracellular matrix fibroblasts, improves ion transport and decreases cell matrix adhesions (Howitt et al. 2006)
    - Stimulates healing by initiating a focal inflammatory response (Perle-Lawson 2004)

Fig. 2. Narson 6 instrument and demonstration of applied instrument technique on the intervention hand.

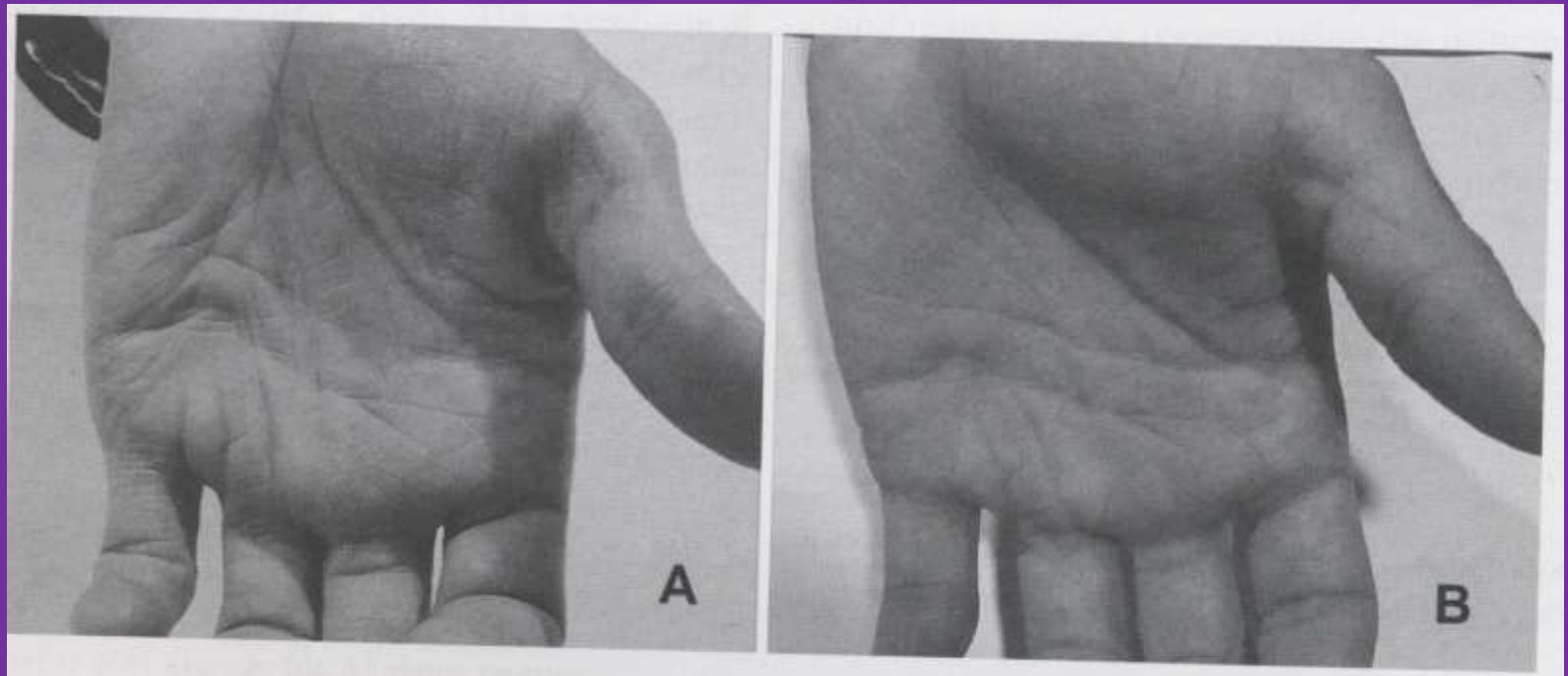

Fig. 4. Primary intervention hand, before and after the 8-week intervention period.

Extra background on DF

- Ombregt et al. *"A system of orthopaedic medicine", first edition, Saunders 1995, p71-77*

- Kesson-Atkins *"Orthopaedic medicine, a practical approach, 2nd edition, Elsevier 2005, p65-82*

DF in acute stage ?

- Treatment techniques that agitate tissue fluid increase the chance contact of the macrophage with debris
- Can be applied during the early stages of inflammation to promote phagocytosis → healing (Evans 1980)
- → gentle transverse frictions

Reduction of pain

- Gate control theory Melzack & Wall 1965
  - The greater the mechanoreceptor stimulation, the greater the level of pain suppression (Bowsher 1994, Wells 1994)
- Wyke B 1969 (stimulation mechanoreceptor)
- Cyriax J 1984
- Van Lauwe L 1988
- Yamashita T et al 1993 (destruction Lewis's substance P : neurotransmitter, neurogenic pain process)

Advantage of analgesia

- This induced analgesia is utilized to allow the application of graded mobilisation techniques in acute lesions

- DF can also be used for diagnostic purposes (De Coninck & Meeus 2005) as a partial alternative for local anaesthetic

- Goats GC(1994) : "***Massage, the scientific basis of an ancient art : part 2. Physiological and therapeutic effects***". Br J Sports Med 1994 28:153-156
  - Release of antalgic neurotransmitters

Type II, DF + Mill's, efficiency ?

- Troisier : *131 cases in which good and excellent results were achieved in 63% by DTM and manipulation*
  - Troisier, O, Les Tendinites épicondyliennes. *Rev Prat* 1991;41(18):1651
- RCT : DTM + manip versus phonophoresis + exercise
  - *Greater improvements regarding pain, pain-free grip and functional status compared to control group*
    - Nagrale, AV, Herd, CR, Ganvir, S, Ramteke, G, Cyriax physiotherapy versus phonophoresis with supervised exercise in subjects with lateral epicondylalgia: a randomized clinical trial. *J Man Manip Ther* 2009;17(3):171–178

RSWT and tennis elbow ?

- *"useful conservative alternative"*

  - Haupt, G, Use of extracorporeal shock waves in the treatment of pseudarthrosis, tendinopathy and other orthopedic diseases. *J Urol* 1997;158(1):4–11
  - Hammer, DS, Rupp, S, Ensslin, S, et al, Extracorporeal shock wave therapy in patients with tennis elbow and painful heel. *Arch Orthop Trauma Surg* 2000;120(5–6):304–307
  - Krischek, O, Hopf, C, Nafe, B, Rompe, JD, Shock-wave therapy for tennis and golfer's elbow – 1 year follow-up. *Arch Orthop Trauma Surg* 1999;119(1–2):62–66

- *RCT's comparing different ESWT protocols with placebo did not show strong statistical evidence in favour of ESWT*

  - Spacca, G, Necozione, S, Cacchio, A, Radial shock wave therapy for lateral epicondylitis: a prospective randomised controlled single-blind study. *Eura Medicophys* 2005; 41:17–25
  - Chung, B, Wiley, J, Effectiveness of extracorporeal shock wave therapy in the treatment of previously untreated lateral epicondylitis: a randomised controlled trial. *Am J Sports Med* 2004; 32:1660–1667
  - Buchbinder, R, Green, SE, Youd, JM, et al. Shock wave therapy for lateral elbow pain. In: *The Cochrane Library, Issue 3, 2006*. Chichester: John Wiley; 2005.

- Lopez M. et al. *"Effectiveness of diacutaneous fibrolysis for the treatment of subacromial impingement syndrome : a RCT"*, Manual Therapy 18, 5 (2013) 418-424

ABSTRACT

Our objective was to assess the effectiveness of Diacutaneous Fibrolysis on pain intensity, range of motion and functional status in patients suffering from Subacromial Impingement Syndrome. A randomised controlled trial was conducted in two Spanish National Health Service Primary Health Care Centres. Participants ($n = 120$) were randomly assigned to one of three groups (intervention, placebo or control groups). All three groups received a protocolised treatment based on therapeutic exercises, analgesic electrotherapy and cryotherapy. Additionally, the intervention group received six sessions of Diacutaneous Fibrolysis treatment; the placebo group received six sessions of sham Diacutaneous Fibrolysis treatment, while the control group received only the protocolised treatment. Pain intensity, available active range of motion and function were measured pre-treatment, post-treatment, and at a three-month follow-up. At the post-treatment assessment, differences between intervention and control groups were statistically significant or clinically relevant in function, flexion, extension and external rotation movements. Differences between placebo and control groups were significant only in extension movement. No significant differences were found in pain intensity. At the 3 month follow-up assessment, between-groups differences were not statistically significant and clinical relevance was achieved only for external rotation movement between intervention and control groups. At the post-treatment assessment 89% of the participants in the intervention group, 76% of the participants in the placebo group and 67% of the participants in the control group reported subjective improvement ($p < 0.01$). In conclusion, adding Diacutaneous Fibrolysis to the conservative treatment of Subacromial Impingement Syndrome improves function and external rotation movements and also gives significantly higher patient satisfaction.

Diacutaneous Fibrolysis is a non-invasive physiotherapeutic technique, developed following Cyriax Deep Friction Massage principles, used to treat the mechanical or inflammatory pain of the musculoskeletal system. Diacutaneous Fibrolysis is applied by means of a set of metallic hooks having the advantage of allowing a deeper and more precise application, which could not be achieved manually. The aim is to release adherences between the different musculoskeletal structures (Tricás et al., 2010). The mechanism of action is thought to be mechanical, tearing the connecti

Very aspecific treatment technique, based on what…??

The inclusion criteria were as follows: patients aged 18 years and over with clinical diagnosis of Subacromial Impingement Syndrome. For the clinical diagnosis of Subacromial Impingement Syndrome, Neer impingement sign (Neer, 1983) and Hawkins–Kennedy impingement test (Hawkins and Kennedy, 1980) were used. Both manoeuvres have been widely used to define Subacromial Impingement Syndrome in research and clinically. They have acceptable sensitivity and specificity (Park et al., 2005) and they are highly reliable (Johansson and Ivarson, 2009).

Fig. 2. Diacutaneous Fibrolysis applied in the distal posterior edge of the deltoid muscle. A – actual technique. B – placebo technique.

- Luque-Suarez A. et al. "*Short term effect of kinesiotaping on acromiohumeral distance in asymptomatic subjects : a RCT*", Manual Therapy 18, 6 (2013) 573-577

ABSTRACT

Objectives: The first aim of this study was to investigate whether kinesiotaping (KT) can increase the acromiohumeral distance (AHD) in asymptomatic subjects in the short term. The second aim was to investigate whether the direction of kinesiotaping application influences AHD.

Background: In recent years, the use of KT has become increasingly popular for a range of musculoskeletal conditions and for sport injuries. To date, we are unaware of any research investigating the effect of kinesiotaping on AHD. Moreover, it is unknown whether the direction of kinesiotaping application for the shoulder is important.

Methods: Forty nine participants were randomly assigned to one of three groups: kinesiotaping group 1 (KT1), kinesiotaping group 2 (KT2) and sham kinesiotaping (KT3). AHD ultrasound measurements at 0° and 60° of shoulder elevation were collected at baseline and immediately after kinesiotape application.

Results: The results showed significant improvements in AHD after kinesiotaping, compared with sham taping. The mean difference in AHD between KT1 and KT3 groups was 1.28 mm (95% CI: 0.55, 2.03), and between KT2 and KT3 was 0.98 mm (95% CI: 0.23, 1.74). Comparison of KT1 and KT2 groups, which was performed to identify whether the direction of taping influences the AHD, indicated there were no significant differences.

Conclusion: KT increases AHD in healthy individuals immediately following application, compared with sham kinesiotape. No differences were found with respect to the direction in which KT was applied.

2. KT1 (left), applied with 100% tension in maximal external rotation. KT3 (right) applied with no tension and in neutral rotation (sham taping).