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EDITORIAL

Ligaments and positional release techniques?

The echoes of the 1st World Congress on Fascia Research continue to find their way into the pages of JBMT, as we continue to publish papers emerging from that important event in October 2007. In this issue there are more important papers, including Solomonow's *Ligaments: A source of musculoskeletal disorders*.

This review of the anatomy, physiology and pathophysiology of ligaments, includes some surprising (to this reader) new clinically important information. Ligaments it seems are far from simply being restraining structures that are strategically placed to support and stabilise joints, while maintaining normal tracking during movement. In addition they are sensory organs that provide proprioceptive input to the CNS, as well as having reflexive influences on associated muscles, which therefore become major elements in the stabilisation of joints.

As Solomonow shows, when normal function is disturbed—by trauma for example—instability results, with serious implications for the safety of the joints, as well as creating disturbed motor and sensory effects.

It becomes clear in this substantial review that a ligament's function, when under tension, or when it is stretched, is completely different from that which applies when it is slack.

Solomonow's clear statement (2009) that ligaments are "completely non-functional in compression or when shortened below their resting length" offers a potential explanation for the mechanisms involved in at least one version of positional release methodology—as discussed later in this editorial.

The behaviour of ligaments are complex—with many elements entering the equation—for example the phenomena of creep and hysteresis. The way load is applied to ligaments, in terms of the speed with which this occurs, as well as repetitions, and ambient temperature, all influence responses, and the review paper details these with clarity.

Ultimately, excessive elongation of ligaments leads to instability, laxity and the potential for injury. There are optimal rest requirements, to help prevent such damage, and the research into these is discussed.

These issues are particularly important for those working with the effects of cumulative microtrauma.

Over all, moderate repetitive stimulation of ligaments coupled with appropriate rest and recovery allows the tissue to hypertrophy, increase its strength and protect joint stability in persons exposed to more demanding physical activity.

Conversely of course, inactivity can lead to degeneration, while static or repetitive loading produces microtrauma and inflammation. What emerges from this detailed evaluation of ligament behaviour is that normal function depends on a *dose–duration–rest-repetition* formula—how much load? for how long? and how often?—with the duration of rest periods being critical.

Positional release implication

Positional release technique (PRT), as used in osteopathy, involves the placement, for brief periods, of soft tissues or joints, into positions of ease, to encourage self-regulating influences to operate more efficiently, resulting in greater range of motion, reduced pain, etc. However just what the underlying mechanisms of PRT are remains a matter for debate and research.

The ways in which the 'ease' position is achieved varies, although placing restricted or dysfunctional tissues into a comfort state always involves 'indirect' approaches, which attempt to disengage from restriction barriers.

For example, in Strain–counterstrain methodology, a palpated sensitive point is used as a monitor to guide the tissues towards ease, via feedback

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from the patient. As the reported pain level reduces (from a starting point of '10' to '3' or less), the tissues being palpated are felt to become slacker and less tense (Jones, 1977).

The ease position is then held for 90 s or so, before being gently released.

In Functional positional release a similar end-point of 'comfort' or 'ease' is achieved, however without use of patient feedback, purely by the palpated sense of the tissues relaxing from their previously hypertonic state as they are carefully positioned (Johnston, 1964).

A 'facilitated' version of this approach also exists (discussed below), and the evidence provided by Solomonow may have implications for its methodology, over and above the various hypotheses that currently exist as to the mechanisms involved which range from circulatory enhancement, to neurological resetting (D'ambrogio & Roth, 1997; Chaitow 2007).

More recently Meltzer and Standley (2007) having noted that, while clinical studies support the efficacy of positional release methods, little is known regarding the cellular response to tissues being placed in 'ease'. Studies were therefore undertaken to investigate human fibroblast proliferation and interleukin secretory profiles, in response to modelled repetitive motion strain, as well as to modelled indirect osteopathic positional release methods.

Their findings were that the resulting data: "suggests that fibroblast proliferation and expression/secretion of pro-inflammatory and anti-inflammatory interleukins may contribute to the clinical efficacy of indirect osteopathic manipulative techniques."

Is there also a ligamentous explanation?

Some years ago Schiowitz (1990), who developed the facilitated positional release (FPR) model, added various modifications to the protocols briefly outlined above, incorporating—for example—compression—or distraction—of the tissues being placed into an 'ease' position.

Some of these facilitated positions necessarily involve crowding joints, or slightly distracting them, to achieve a sense of palpated ease in associated musculature. In FPR methodology the position of ease is held for a relatively brief (5 s or so) period, whereas in traditional positional release methodology, 90 s is recommended (Jones, 1977; D'ambrogio & Roth, 1997).

In response to personal enquiry as to the potential effect of 20 N (approx 4 kg) of compressive force, applied to a joint for a brief (60–90 s) period, Professor Solomonow has responded (personal communication January 8, 2009):

> If you apply only 60–90 s of relaxing compression on a joint, I would say the established mechanism will confirm that an hour plus of relaxation of muscles may result. This may come not only from ligaments, but also from capsules and tendons.

Interestingly, light (non-traumatic) stretching of a ligament will have a similar effect (Solomonow, 2009).

However, Solomonow cautions: "Stretching of ligaments for muscle relaxation should be done when one knows which muscles are controlled by which ligaments to maximize the effect" (personal communication January 8, 2009).

It may be of interest, in widening the perspective on these approaches, that in physiotherapy methodology the use of some aspects of 'unloading taping' mirrors many of the 'crowding' elements of PRT (Morrissey, 2007)l.

Both 'ease' and 'unloading' should produce a slackening of (some?) ligaments (and possibly lightly stretch others). The question then is, does the 'slackening' of ligaments involved in the positioning of joints during FPR (or unloading taping), have sufficient reflexive influence on associated musculature to account—in part at least-for the effects of positional release?

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