THE ANATOMY TRAINS

TREVOR AUNG THAN, APAM, explains why physiotherapists should know about the myofascial meridians.

This is a neat party trick—ask a friend/patient/partner (or do it yourself) to forward bend, or *uttanasana* as it called in yoga practice, and gauge their range of movement. Then, as an intervention, get them to slowly and firmly roll out their plantar fascia with a massage ball (a tennis or golf ball will work as well) for one minute for each foot. Re-test the forward bend. For most people, you will find either a moderate to profound increase in range of their forward bend and a marked subjective relief of tightness in the posterior line of the body (whether it be hamstrings or along the lumbar spine). How is this possible? How can an intervention so simple and seemingly removed from the 'problem' area be so effective? Only within the fascial system can the answer be found.

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At university, anatomy was my worst subject. I found the Latin names of the muscles too abstract, the muscular attachments too numerous—all in all, something that was too complex. Looking back, learning anatomy at its base level is important, but I found all the analogies of levers too mechanical. I put it down to anatomy not being my strong point. It wasn't until I worked for Cirque du Soleil and saw the human body doing extraordinary things that I began searching for other answers. There must be a way to explain how the human body can perform tumbling, acrobatics and parkour? Luckily, my manager at Cirque passed on the details of an upcoming 'Anatomy Trains' workshop, hosted by Thomas Myers in Hong Kong. I signed up. I hadn't heard of Myers but I was intrigued. That was in December 2011.

That three-day workshop was a game changer for me, but at the time, the information was difficult to digest. It was so far removed from what I had learnt at university. The Anatomy Trains are based on continuous 'trains' of fascia that longitudinally traverse the entire body. In my studies, the fascia was the connective tissue that just wrapped the muscle, and in cadaver studies it was usually disposed of so effectively that it was mostly absent. At university we are taught an 'isolated muscle theory', which defines a muscle's function solely by approximating the proximal and distal attachment points (Myers 2009). But in order to understand true human function, we need to look at the larger parts of the whole as a system that is interconnected throughout the body like a web. Fascia permeates not only muscles, ligaments and tendons but also all of our internal organs. It has much more purpose and function than we realise.

Myers is at the forefront of spatial medicine, a new frontier exploring the interconnectedness of the body. Others in this renaissance include Dr Stephen Levin, Dr Donald E. Ingber, Robert Schleip and Tom Flemons. These researchers argue we are not just a collection of bones and muscles wired together by tendons and ligaments. Rather, from cells to molecules, organs, bones and soft tissues, we are synergistically-linked tensegrity structures. Tensegrity is the portmanteau of the words tension and integrity, coined by author and inventor Buckminster Fuller in the 1960s. Tensegrity structures gain their strength from the compressive and tensile forces throughout the structure, rather than from the strength of individual members.

Separate muscles or 600 fascial pockets?

Myers states that 'While every anatomy lists around 600 separate muscles, it is more accurate to say that there is one muscle poured into 600 pockets of the fascial webbing. The "illusion" of separate muscles is created by the anatomist's scalpel, dividing tissues along the planes of fascia. This reductive process should not blind us to the reality of the unifying whole'. It's interesting to note the word anatomy stems from the Greek word anatemnōwhich means 'to cut'. From this reductionist view, re-examining the whole integrated body can be somewhat challenging. It is obviously important to study this base element but somewhere along the line I believe we sometimes can have difficulty putting it all together.

Lee and Vleeming have previously described various slings in the body formed by the continuity of muscles (Lee 1999; Vleeming et al 2007). For example, their anterior oblique sling formed from the internal/external obliques continuing into the adductor muscles. The Anatomy Trains concept builds upon this and links 10 separate myofascial chains within the body, each having its own line of pull and myofascial linkages. There are fascial connections which obviously may have more than a single line of pull so can be incorporated into two or more lines. The plantar fascia release influencing forward bend directly influences the superficial back line which incorporates the following myofascial tracks: plantar fascia, gastrocnemius and Achilles tendon, hamstrings, sacrotuberous ligament, sacrolumabr fascia/erector spinae and epicranial fascia.

What can go wrong in these trains?

When there is a pain in one or more of these areas, as we already know, the actual problem might be at a point more distal or proximal along the corresponding myofascial line. Fascial theory suggests that what we know as a myofascial trigger point might actually be predominantly fascial tissue that is dehydrated and painful due to injury, inactivity, occupational stresses or poor posture, among other things. Once the sponge-like mechanism of this healthy tissue is disrupted, it adheres or sticks to surrounding planes of fascia. This binding of the fascia may objectively be seen as a poor straight leg raise or reduced motion at a nearby joint. These points are often very painful, as fascia has up to nine times more mechanoreceptors than muscle tissue (Stecco et al 2009).

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How do we keep our fascia healthy?

Our connective tissue is much more elastic than we once thought, even in dense tissues such as tendon and aponeuroses. Fascial elasticity is also stored and returned very quickly. Think of a super bouncy ball which can bounce extremely high. What we once thought was shortening and lengthening of muscle during rhythmical motions such as running probably is happening more so in the fascial tissues. Measurements of calf lengthening while running have shown the dorsiflexion length is coming from an elastic stretch of the fascia, while the muscle is contracting isometrically (Kubo et al 2006). Athletes that can harness this elastic recoil in the fascia will thus require less energy expenditure and be more efficient. Training incorporating bouncing or using a preparatory countermovement (or pre-stretch of the tissues) will help to train the fascia healthily.

Training the body as a whole and utilising long myofascial chains is also believed to be healthier for the fascial system. The evidence suggests that the fascial system is better trained by vector variation—changes in angle, tempo and load (Huijing 2007). Isolating muscles along one track (eg, with an exercise machine) may be useful for those muscles but is less than useful for all the surrounding tissues. Loading the tissue one way all the time means it will be weaker when life, which is rarely repetitive, throws that part of the body a curve ball (Myers 2011).

Why is it important to us as physiotherapists?

Learning about the myofascial meridians is not in any way a comprehensive treatment technique. It is not a complete treatment program, nor is it steeped in validated research. It just reminds us as therapists to once again look at the individual as a whole rather than just an injury, syndrome or problem.

Trevor Aung Than is an Australian-trained physiotherapist. He previously has worked with Cirque du Soleil as a performance medicine therapist in Macau, China. In 2011 he trained with Thomas Myers in Hong Kong learning the Anatomy Trains concept which teaches the myofascial meridians. Trevor is currently the Head of Dancer Wellbeing at the West Australian Ballet company and runs Circus Conditioning functional fitness circuits (circusconditioning.com).

Trevor presented an Anatomy Trains clinical evening at the WA Branch last year. This article is a summary of that presentation.