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Management and Prevention of Lateral Ankle Sprains

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Lateral ankle sprains are commonly seen in the sports medicine arena. Traditional treatment of this particular injury is initial symptom management from a Western perspective. I will review an integrated Western practice that can utilize Eastern strategies and philosophies. This combination will suggest more detailed evaluation and lead to more optimal long-term recovery outcomes.

Western Perspective

In sports medicine, most lateral ankle instability results from physiological (mechanical and functional) instability. It is necessary to compare normal ankle mechanics to abnormal mechanics, sequelae to these sprains, and rate dysfunction of the surrounding tissues involved. The basic treatment protocol focuses on accurately assessing joint function, increasing range of motion, and protecting the healing tissues where there may be excessive movement.

Mechanical/Functional Chronic Ankle Instability Paradigm	
Mechanical - anatomic changes resulting from initial ankle sprain	Functional
• Degenerative changes - repetitive bouts of ankle instability over time • Pathological laxity - ankle ends up in vulnerable positions during functional activities (talocrural and subtalar joints) • Arthrokinematic restrictions - excessive range of motion or decreased ROM • Synovial changes - impinged or hypertrophied synovial tissue between ankle complex bones	• Impaired postural control - balance of synergistic muscle tissues • Impaired neuromuscular function - muscular recruitment patterns diminished • Impaired proprioception - synergetic ability of nerve conduction velocity diminished • Strength deficits - decreased strength of the surrounding muscle tissues

Mechanical and function instability creates recurrent ankle sprains. Lateral ankle sprains, usually due to excessive inversion and supination, injure the anterior talofibular and calcaneofibular ligaments and the subtalor and tibiofibular articulations. Once a ligament is lengthened, over time, if the tendon structures are not stabilized, residual dysfunction (hypermobility) may become long-lasting. Typical signs and symptoms include inflammation, pain, decreased range of motion and swelling. Protocol treatments focus on restoring normal accessory joint motion and reducing subluxations, while simultaneously protecting damaged ligaments from external and internal stresses that may compromise the healing process. Thus, RICE (rest, ice, compression, elevation) is the key concept here so as to manage the edema, which can last up to three weeks.

Focus then moves to restoring ligament stability by correcting subluxations and treating accessory motion restriction using joint mobilization. Exercises (closed and open chain) are then implemented to restore range of motion. Resistance is then added to restore strength. Once strength is restored, and we have established normal gait with normal joint mobility, the focus shifts to neuromuscular

control in order to maximize dynamic and reflexive stability of the surrounding tissues.

Eastern Perspective

According to traditional Chinese medicine (TCM), pre-existing factors that contribute to ankle sprains include the consuming of the *qi* and blood (creating Liver and Kidney deficiency); accumulation of dampness; invasion of external pathogens (wind, cold, damp); and, of course, blood stagnation.

Injury mechanisms also play a big part in differentiation among pre-existing factors that create an ankle sprain (chronic condition) versus direct or indirect trauma (acute condition). According to TCM, acute versus chronic represents external versus internal origins of the mechanism of injury. Chronic represents internal pre-existing problems that allow the external pathogens to invade more easily, disrupting the circulation of *qi* and blood in that specific location.

Qi/Blood Stagnation

The concept of TCM is to maintain the flow of *qi* and blood circulation throughout the body. By maintaining this circulation of *qi*/blood, the physiological manifestation of injuries and pain are non-existent. However, if the *qi*/blood becomes stagnant, the flow within the channels around the affected joint becomes blocked and impaired, creating pain along the affected joint. The main physiological manifestation includes pain that is stabbing and fixed for blood stagnation, and wandering and distended pain for *qi* stagnation.

Liver/Kidney Deficiency

According to TCM, the Liver supports the tendons by nourishing them through Liver blood, while the Kidney nourishes the bones. Through years of overstraining, working long hours (standing all the time), constitutional weakness and/or prolonged illness, the *qi* and blood deplete and/or consume specifically the *qi* and blood of the Liver and Kidney. In either case, the lack of nourishment of both the tendons and bones gives rise to ankle-joint injuries. Once again, age is a factor. As we get older, the Liver and Kidney functions decline, and the Kidney *jing* and Liver blood are unable to nourish the tendons and bones sufficiently.

Wind, Cold, Damp Invasion

Differentiation According to TCM and Ankle Sprains				
	Qi/Blood Stagnation	Liver/Kidney Deficiency	Wind, Cold, Damp Invasion	Damp Heat

Scenario	Direct or indirect trauma, swelling/bruising medially and/or laterally, decreased ROM, weakness of joint, fixed pain that is worse at night, and/or movement and/or pressure Acute - Tongue = no change; Pulse = tight or wiry Chronic - Tongue = light purple; Pulse = choppy.	Long-term pain, decrease ROM circumduction, Dorsi/plantar flexion (worse with standing), morning joint stiffness, aversion to cold, fatigue, low back pain Tongue = white, thin coating Pulse = wiry and deep with force, less in Kidney/*qi* position	Wind Wandering pain, worse with windy conditions, aversion to wind, decreased ROM, chills greater than fever Tongue = greasy, thin coating Pulse = superficial, forceful Cold Severe pain, worse with cold, aversion to cold, cold extremities, decrease ROM, pain better with application of warmth Tongue = white coating Pulse = slow, tight Damp Heavy sensation, painful, swelling, fixed location, decreases ROM, worse in rainy and damp weather changes Tongue = greasy, white coating Pulse = slow, soft, slippery	Acute Local burning sensation, redness, swelling, pain, worse with touch, decreased ROM Tongue = yellow, greasy coat Pulse = slippery, rapid Chronic Redness, swelling, pain, worse with touch, decreased ROM, aversion to cold, general body aches, headache, fever Tongue = yellow, greasy coat, red body Pulse = slippery, superficial

Acupuncture points	*Ah Shi* points - regulates circulation of *qi* and blood in channels SP 10 - disperses Blood stagnation LI 4 - source point, dispels blood stagnation, promotes circulation of *qi* in the channels LV 3 - source point, dispels blood stagnation, promotes circulation of *qi* in the channels GB 34 - sea point, harmonizes movement of affected joints and strengthens tendons SP 6 - crossing point of the three yin channels of the foot UB 17 - gathering point of the blood Sedating method all points	K 3 - source point, strengthens bones and tonifies Kidney. Tonify method LV 3 - source point, strengthens tendons and tonifies Liver. Even method GB 34 - gathering point for marrow. Even method GB 39 - gathering point for tendons and reinforces tendons and bones. Tonify method ST 36 - Sea point of Stomach channel, promotes production of blood and tonifies Spleen/Stomach. Tonify method SP 6 - crossing point three yin channels of the foot, tonifies blood and strengthens Spleen, Liver and Kidney. Even method	*Wind* - Sedating method LI 4 - relieve external wind and symptoms SJ 5 - relieve external wind and symptoms UB 12 - relieve external wind and symptoms SP 6 - crossing point Liver-Spleen-Kidney channels, eliminates wind by regulating *qi*/blood SP 10 - improves circulation of blood and is able to eliminate wind through increasing blood circulation Ah shi - regulating local circulation of *qi*/blood GB 40 - regulating local circulation of *qi*/blood GB 41 - regulating local circulation of *qi*/blood Cold LI 4 - relieve external wind and symptoms. Sedate * SJ 5 - relieve external wind and symptoms. Sedate * UB 12 - relieve external wind and symptoms. Sedate SP 6 - crossing point, Liver/Kidney/Spleen channels, eliminates wind by regulating *qi*/blood. Sedate ST 36 - Sea point, dispels cold, warms channels, and tonifies *qi*. Tonify * UB 60 - local point, regulate *qi*/blood circulation. Sedate * UB 63 - local point, regulate *qi*/blood circulation. Sedate * GB 40 - local point, regulate *qi*/blood circulation. Sedate * Ah Shi - local point, regulate *qi*/blood circulation. Sedate * Moxibustion Damp SJ 6 - resolve damp, eliminate wind, eliminate cold SP 6 - crossing point three yin channels, eliminate damp, activate Spleen/Stomach SP 9 - sea point, eliminate damp, activate Spleen/Stomach ST 40 - connecting point, eliminate damp, activate Spleen/Stomach GB 40 - source point, local point, regulate circulation *qi*/blood, eliminate damp UB 63 - accumulation point, local point, regulate circulation *qi*/blood, eliminate damp UB 64 - Source point, local point, regulate circulation *qi*/blood, eliminate damp. Sedating method	ST 44 - eliminate damp heat, reduce fever GB 41 - eliminate damp heat, reduce fever SP 6 - crossing point three yin channels of foot, clear heat, eliminate damp in channels SP 9 - sea point, clear heat, eliminate damp in channels GB 34 - Sea point, clear heat, eliminate damp in channels GB 40 - clear heat, eliminate damp in channels UB 60 - eliminate damp, promote urination, dispels external pathogenic factors SJ 6 - promotes circulation of *qi* in channels, reduces heat, eliminates damp, dispels external pathogens

Patent formulas	*Xiao Huo Luo Dan* (Minor Invigorate the Collaterals) *Jin Gu Die Shang Wan* (Muscle and Bone Traumatic Injury Pill)	*Du Huo Ji Sheng Tang* (Du Huo and Loranthus)	*Feng Shi Tang* (Wind Damp)	*Feng Shi Xiao Tong* Pain (Wind Damp Dispel Pain Pill) *San Miao Wan* (Three Marvel Pill)

Wind, cold and damp pathogens are able to invade through the joints because that is where *qi* enters and exits. Wind characteristics tend to be always moving and changing, and present with pain moving medially to laterally on the ankle. Cold characteristics create *qi* and blood stagnation due to the contracting nature within the channels and tendons, and thus present with severe ankle pain. Damp characteristics create obstructions within the channels due to the accumulation, creating heaviness that leads to stagnation, and thus present with fixed ankle pain, swelling with a heavy sensation, and possible numbness.

Pre-existing conditions that allow these external pathogens to invade include yang and/or yin deficiency. Heat is another factor that can be a result of wind/cold/damp invasion. If an athlete has had long-term wind/cold/damp invasion and has accumulated sitting stagnation, this will generate heat. This also disrupts the *qi* and blood circulation in the channels causing accumulation, which progresses to stagnation in the channels around the affected joint. In TCM, this is referred to as damp heat. Heat presents with redness, feelings of heat around the joint and swelling.

Athletes are exposed to environmental changes that result in possible internal deficiencies. Another factor that predisposes athletes to this condition is diet. Athletes, especially those in high school and college, tend to eat on the run, and are constantly eating fast foods. Fatty, greasy foods, sweets and alcohol impair the Spleen's function. Internally, this gives rise to damp heat accumulation over time. This accumulation moves downward into the lower extremities and blocks the channels, giving rise to ankle injuries and pain.

Conclusion

Lateral ankle sprains are extremely common within the sports medicine arena, yet treatments using only the Western protocol are inadequate in the prevention of recurrent sprains. Understanding and appreciating the pathomechanics, anatomy and mechanics of the ankle complex, one should integrate and appreciate another level within treating lateral ankle sprains, by using licensed acupuncturists and the concept of Oriental medicine within the treatment strategy. The clinical management should include not only the symptoms of both mechanical and functional instabilities, but also address the integration of TCM, emphasizing the prevention and reducing the risk of chronic lateral ankle sprains.

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