

ARTICLE: "Foot Biomechanics and Specific Correction" 9/29/16

This week we are going to talk about a subject which is something very interesting to me and I hope for you it will be as well. The subject is foot biomechanics.

Biomechanics is the study of the mechanical relationship of the foot to the body. The specific foot types we are going to discuss today are the pronating (flat) foot and the supinating (high arch) foot and the specific problems each cause.

The pronating foot is a flat, soft foot which absorbs shock well but causes rotation of the lower extremity such that it can cause knee and back problems in addition to the foot problems that come with a flat foot. Flat footedness also causes overuse of the musculature in the lower extremity which holds up the arch. The foot hitting the ground requires extra effort to support an arch in a pronating flat foot. Therefore, this pistoning effect when the foot hits the ground results in overuse of this supporting musculature. When this happens repetitively such as jogging on a flat foot, the result is shin splints. Shin splints simply result from the overuse of the decelerating muscles which attempt to hold up the arch on the flat foot. When the arch is not supported, the muscle fibers slowly tear away from the bone resulting in a shin splint and resulting inflammation occurs. This is why treatment of shin splints is extremely effective when complimented when arch supports. Supporting the arch decreases the force necessary to lift the arch or control the pronation and increases the overuse which results in the shin splints. Therefore, if an athlete is beginning to develop shin splints, adding an arch support to the shoe is a very effective treatment.

Other conditions caused by pronating foot including patellar tracking syndrome, lower back pain as well as conditions of the iliotibial band and plantar fasciitis of the heel and arch. This is one of the most common things that can occur and is also seen in patients with an extremely high arch. Plantar fasciitis is the inflammation of the broad flat structural support in the base of the heel/foot which supports the arch. The plantar fascia is excessively stretched and torn in the pronating foot and in the high arch resulting in heel pain, pain in the morning and pain in the arch throughout the day.

Treatment of plantar fasciitis is also complimented by the addition of arch supports particularly in the pronating (flat) foot type but also in the high arch supinating foot type. Many types of on the shelf arch supports are effective in treating plantar fasciitis, particularly those with a structural arch which does not smash down with each step. Patients with a high arch can also develop plantar fasciitis and in fact this is often more prevalent as the plantar fascia has adaptively shortened in the high arch patient and is bowstrung and torn when the patient steps down. This type of foot also can benefit from arch supports which decreases the force on the shortened plantar fascia. Additionally, gentle stretching of the plantar fascia and rolling a frozen water bottle on the bottom of the foot can also be effective treatments. Taping the foot is also extremely useful as it decreases the force on the plantar fascia with each step. These patients also complain of pain in the morning, pain in the heel and pain in the arch.

As you can see, pronating and supinating foot types can cause a number of conditions which are both painful and problematic and therefore identifying the particular problem before it becomes severe is extremely important. Many clinics will provide a no cost screening service to identify the source of foot and ankle pain and this is something that should be taken advantage of if you are developing heel pain or foot pain.

For more information on plantar fasciitis, high arches, low arches and foot pain, do not hesitate to contact the clinic for a no cost screening.

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