Dynamic Chiropractic

SPORTS / EXERCISE / FITNESS

Protecting Runners With Orthotic Support

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Running injuries are caused by a variety of factors. In addition to spinal and lower extremity subluxations, contributory elements often include footwear problems, gait asymmetries, muscle imbalances and training errors. During my nearly 30-year chiropractic career, I have had the opportunity to treat many patients for injuries related to running. I have found that one of the most effective forms of adjunctive care, especially when gait biomechanics are altered, is custom-made, flexible orthotics.

Orthotics are an excellent adjunct to successful chiropractic care of runners' injuries. Here is a brief overview of three common injuries experienced by runners, along with selected treatment considerations.

Achilles Tendinitis

The Achilles tendon insertion on the calcaneus is medial to the axis of the subtalar joint, making the calf muscles the most powerful supinators of the subtalar joint.[1] Therefore, when excessive pronation occurs, the tendon eventually undergoes overuse degeneration and inflammation.

This was described by Clement, et al.[2] They discussed how "pronation generates an obligatory internal tibial rotation, which tends to draw the Achilles tendon medially. Through slow-motion, high-speed cinematography, we have seen that pronation produces a whipping action or bowstring effect in the Achilles tendon." This whipping action, when exaggerated, may contribute to microtears in the tendon, particularly in its medial aspect and initiate an inflammatory response. These investigators expressed their belief that controlling functional overpronation with corrective orthotic devices is a necessary treatment for most patients with Achilles tendinitis.

Patellofemoral Pain

Many factors can contribute to improper tracking of the patella during running, such as genu valgus, tibial torsion, tight hamstrings, weakness of the vastus medialis and training errors (e.g., excessive hill running). In my experience, however, the most common biomechanical fault associated with patellofemoral pain in runners is an increased Q angle. Whenever the measurement of this angle is above normal limits, the probability of developing tracking disorders, patellofemoral pain and chondromalacia patellae greatly increases.

The most effective way to decrease a high Q angle and improve the tracking of the patella is to prevent excessive pronation by the use of flexible, custom-made foot orthotics.[3] Flexible orthotics that support all three arches of the foot have been found to reduce the Q angle immediately.[4] Another study reported that soft orthotics are more effective in reducing knee pain and preventing recurrence than a traditional therapeutic exercise program.[5] My experience is that specific chiropractic adjustments, combined with custom-made, flexible orthotics and a simple, at-home rehabilitative program, provide the most effective and most comprehensive level of care for patients with patellofemoral pain.

Plantar Fascitis

This condition causes heel pain in the area of the medial calcaneal tubercle, which is the insertion point for the plantar fascia. This aponeurosis is made of strong yet flexible connective tissue that functions as a bowstring to hold up the medial longitudinal arch. Since the plantar fascia is the major structure that supports and maintains the arched alignment of the foot, it is placed under considerable stress during running.[6]

Excessive pronation has been identified as the most common biomechanical finding associated with plantar fascitis, although a weight-bearing evaluation sometimes finds rigid supination.[7] In either case, custom-made orthotics that provide shock absorption and support for the medial longitudinal arch are needed, along with adjustments of the foot and ankle.

Orthotics Help Protect Runners

Whenever a runner has an injury, it is important to assess the extrinsic contributors, as well as the intrinsic biomechanical faults. Custom-made orthotics have been shown to significantly decrease foot pronation velocity and tibial internal rotation.[8,9] Wearing orthotics while running also reduces the electromyographic activity in the biceps femoris, tibialis anterior and medial gastrocnemius.[10] Appropriate use of custom-made orthotics can help decrease the high incidence of overuse lower extremity injuries. By reducing the stress and strain of running, a well-designed orthotic can speed a full return to running activities, while also helping prevent re-injury.

References

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