



Mechanism of a high Forefoot Valgus Deformity

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Definition: A forefoot valgus deformity is a structural deformity in which the forefoot is everted relative to the rearfoot, when the subtalar joint is in its neutral position and the midtarsal joint is locked.

The forefoot motions of inversion and eversion commonly function above the longitudinal midtarsal joint axes and the normal amount of forefoot inversion available from the locked midtarsal joint neutral position is approximately 4 - 6 degrees.

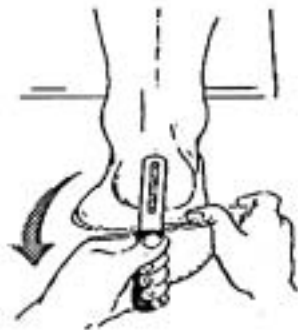


Figure 1:

Example of a Forefoot Valgus deformity, whereby the forefoot is everted to the rearfoot while the subtalar joint is in neutral and the midtarsal joint is locked.

Therefore, a foot with a forefoot valgus greater than 6 degrees will generally be unable to compensate completely about the longitudinal midtarsal joint axes and thus require secondary compensation about the oblique midtarsal joint axes and subtalar joint axes.

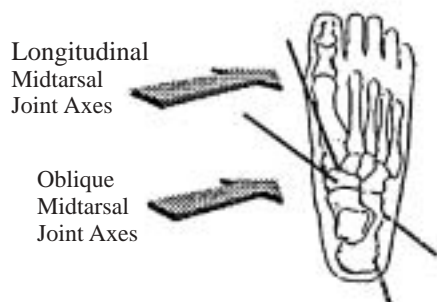


Figure 2:

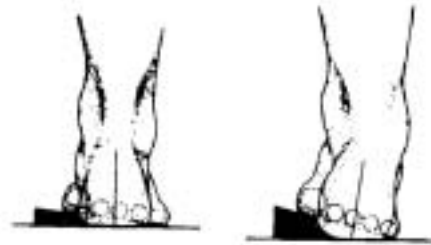


Figure 3:

The left forefoot is being inverted less than 6 degrees about the longitudinal midtarsal joint axes and the midtarsal joint motion available (being approx 6 deg) is adequate to fully invert or compensate without affecting the rearfoot. However, the right picture depicts a forefoot being inverted greater than 6 degrees. Since the midtarsal joint has only 6 degrees available for the inversion, the subtalar joint commonly supinates to provide additional compensation for large degrees of inversion about the forefoot.

When a foot diagnosed with a large forefoot valgus deformity strikes the ground during the gait cycle then the ground reaction forces placed under the big toe joint, then the 1st metatarsal is forced up according to the degree of the forefoot valgus deformity.

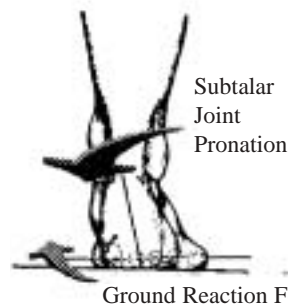


Figure 4: During the gait cycle when the rearfoot is pronating, the forefoot must simultaneously compensate for the ground reaction forces under the big toe joint by inverting about the longitudinal midtarsal joint axes.

However, a foot with a forefoot valgus greater than 6 degrees will be unable to fully compensate or adjust around the longitudinal axes without additional midfoot and/or rearfoot compensation. #

