

Biomechanical analysis of different foot morphology during standing on a dynamic support surface

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Abstract: Foot is a significant element during the balance as the main organ that connects with surface. From the research of habitually barefoot people and habitually shod people, there were significant differences in distance between the hallux and the interphalangeal joint of the second toe. Habitually shod males had a high risk of injury because of the lack of toes function. Based on these differences in foot morphology and importance of hallux during activities, expanding the distance between the hallux and other toes could increase the ability of hallux, especially the balance. In order to analyse the influence of hallux during balance tests, three conditions were set with light silica instruments: 1) normal toes, 2) expanding toes, 3) binding toes. During the experiments, the 6-DOF transportation vibration platform had continuous sinusoidal translation in the anterior-posterior and medial-lateral directions with a sine wave. From the results, binding toes showed larger movement of centre of pressure than normal toes and expanding toes. In addition, people with normal toes also indicated larger sway than expanding toes. It could conclude that control the toes function causes instability during static balance but improve the hallux function can increase the balance ability.

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