

The significance of the calcaneocuboid joint in the evolution of human bipedality. M.E. LANDRY, University Hospital, Kansas City, and D. AGOADA, University of Washington, Seattle.

The calcaneocuboid joint appears to have been of major importance in the evolutionary development of the midtarsal joint mechanism that allows the normal human foot to act as a stable, rigid lever in bipedal gait. However, the hypermobile flatfoot abounds throughout the world's modern population, with its associated symptomatology. It is apparent that the higher arch foot has evolved in response to the selection for greater stability. In this study, 30 human cadaver feet were dissected and 20 human subjects' feet were examined, clinically and radiographically. The feet were grouped into different morphologic types: pes cavus (rigid, high arch), pes planus (flexible, flatfoot) and normal arched. The calcaneocuboid joint configurations were then compared to each other, and to skeletal foot specimens of *Pan troglodytes* and casted specimen of Olduvai Hominid 8. Among the results, it was found that the pes cavus foot type had a more sellar, or saddle-like calcaneocuboid joint articulation than did the normals or pes planus. In pes planus and in OH 8, the joint was rather flat, approaching the condition seen in specimens of *Pan*. While the calcaneocuboid joint of OH 8 was clearly more like that of modern humans than *Pan* in a number of features, it did resemble that of the hypermobile flatfoot. The midtarsal and subtalar joint pronation observed in human subjects with pes planus was also seen in the assembled skeletal elements of OH 8. The results of this study supports the idea that changes in the calcaneocuboid joint during human evolution have helped to produce a functionally more stable, higher arched foot. It appears that by the time of OH 8 (1.8 million years ago) the hominid foot, while approaching that of the modern human configuration, was still hypermobile, with a flat longitudinal arch, as seen today in human pes planus.

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