



## Foot and Ankle Arches Complexity

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### Abstract

The presence of high rocky feet in modern society is the result of natural selection of long-distance running. On the other hand, the old trait of unripe feet on our great baboon relatives has been preserved because of their preference to hold tree branches as part of their arboreal life. The distinction between baboon feet and human feet began with the ancestor of the first man *Ardipithecus ramidus*, in which the reinforced plantar tissue emerged, which supported the premature movement of the earth before the appearance of the real arch. However, the skeletal longitudinal arch structure itself did not begin to evolve until *Australopithecus afarensis* transformed a much lower longitudinal arch (compared to modern humans) and the first signs of a parallel arch associated with it.

### Introduction

The foot is a body region that is farther away from the leg and has 28 bones. These bones are organized into longitudinal and transverse arches with the support of various muscles and ligaments. There are three arches in the foot, called:

1. Middle longitudinal arch
2. Lateral longitudinal arch
3. The opposite arch

These bows play an important role in standing, walking, and running. Their shape allows them to act in the same way as spring, carrying weight and capturing the shock produced during travel. The flexibility provided by the foot by these arches helps with tasks such as walking and running.

### Medial arch

The middle arch is higher than the longitudinal arch lateral. It is composed of calcaneus, talus, navicular, three cuneiform (middle, middle, and lateral), as well as the first, second, and third metatarsal. Its top is located at the highest point of the talus, and its two or points, where it sits in a standing position, are the tuberosity in the plantar area of the posterior calcaneus and the first, second, and third bone heads before. Its weakest part (i.e., the part that should be found most in excessive pressure) is the joint between the talus and the navicular, but this part is bound by the plantar calcaneonavicular ligament aka spring ligament, which is flexible and thus able to quickly replace the arch. In its original state when the disruptive power is removed.

The ligament is tightened in the middle by connecting to the deltoid ligament of the ankle joint, and is supported under the tendon of the posterior Tibialis, which spreads to the posterior tendons and prevents unnecessary ligament tension or similar amount of stretching as it can stretch permanently.

### Lateral arch

The lateral arch is composed of the calcaneus, the cuboid, and the fourth and fifth metatarsal. Two notable features of this arch are its stiffness and low height. The two strong muscles, the long plantar and the plantar calcaneocuboid, as well as the Extensor muscles and the short toes of the small toe, maintain its integrity.

### Transversal arch

The horizontal arch is composed of three cuneiform, a cuboid, and five metatarsal bases. The horizontal arch is strengthened by the joint muscles, plantar, and dorsal ligaments, the short muscles of the first and fifth toes (especially the opposite head of the Adductor hallucis), and the Peronæus longus, the artery that runs between the muscles arches.

### Conclusion

However, the human feet, as well as the central longitudinal arch of the human foot, differ in that the front part of the foot is twisted in the back of the foot, so that all the toes touch the ground at the same time, too. Twisting is so marked that the middle toe, big toe or hallux, (for some people the second toe) often exerts a very powerful stimulus in walking and running. This gives the human foot a 'walking' or external look compared to other monkeys.

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**Received:** 07-Jan-2022, Manuscript No. CRFA-21-49016; **Editor assigned:** 10-Jan-2022, PreQC No. CRFA-21-49016 (PQ); **Reviewed:** 17-Jan-2022, QC No. CRFA-21-49016; **Revised:** 24-Jan-2022, Manuscript No. CRFA-21-49016 (R); **Published:** 31-Jan-2022, DOI: 10.4172/2329-910X.1000328

**Citation:** Sule I (2022) Foot and Ankle Arches Complexity. Clin Res Foot Ankle, 10: 328.

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