



Half Foot Training Footwear for Safer and Faster Running from Masters Athletes to Professional Athletes

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Abbreviations: ATA-Anterior Transverse Arch, JMA-Japan Masters Athletics.

The International Olympic Committee (IOC) session in 2013 had chosen Tokyo as the host city for the 2020 Olympic and Paralympic Games (Tokyo 2020 Games). After that, the preparation organization for Tokyo 2020 Games was established and Japan Olympic Committee (JOC), Japan Paralympic Committee (JPC) and other committees have continued various activities [1]. Thus, further development of international friendship and sports promotion has been expected. It can give various beneficial influences for wide range of sports, medical, economic and social fields [2].

There are many kinds of sports, in which the basic category would be the athletics. The authors have been involved in Japan Masters Athletics (JMA) so far, and have continued to give masters athletics runners various lectures by workshops, books and medical articles [3,4]. Currently, we have been coaching several candidates for the Paralympic Games who may have won in the Tokyo Paralympic Games.

Furthermore, we have advised mainly Masters Athletics players on how to run faster and safer without any injuries. There are several important tips, such as two-axis running, soft landing way and stretching using pole method [5,6]. The ideal running style is to run without excessive tension or force. There is certain footwear for the practice of better running. Using them, the athletes can get a relaxed walk and good run without injuries. Authors have continued workshops so that the athletes can get a good run. In this article, we would like to introduce certain footwear and explain the beneficial effects.

There have been Ashinaka, which was worn on the soles of the foot. This name is from the following Japanese language, in which Ashinaka means Ashi (foot) and naka (half, medial, center). Then, it means half foot training footwear, and actually it covers the front half of the sole. It has been originally made of rice straw, and utilized well for long years until now [7]. Authors can make the same footwear by knitting with thick plastic straps (Figure 1). There is a strap at the center of the front, and it is fixed to foot by pinching it with the first and second

fingers of the toes. It covers the front half of the sole where there is a strong Anterior Transverse Arch (ATA) [8]. Thus, Ashinaka has an important role to absorb the impact from the ground.

On the other hand, Ashinaka does not cover the toes and heels. The characteristic point would be that the toes often protrude forward and float, and usually does not put a force on the 1st finger (thumb). In order to stop suddenly the body motion, the toes sometimes put a force and touch the ground. In contrast, the back half of the foot, including the heel, always touches the ground directly and plays a role of preventing slippery.

Through the running practice using Ashinaka, three main effects would be shown. The first is not to put great force on the toe of the foot [9]. As we usually wearing shoes, all fingers of the foot are protected in the shoes. We sometimes put great force on the toe of the foot, kick it, and move the body forward. On the other hand, the five fingers of the foot slightly protrude forward when wearing Ashinaka. Then, the fingers can touch the ground slightly, leading to better sensation of the toes and soles.

The second is to adjust the arch of the foot [10]. There is an important "foot triangle" in the foot. It is always supported by three points, which are MP joints of 1st/5th fingers and heel. Body weight is well-balanced on the foot triangle [11]. Therefore, no extra loading has been imposed on each of three arches. As a result, the burden and stress on the foot can be reduced, and injuries such as plantar fasciitis can be prevented. Furthermore, the center of gravity of the body is situated on not the front ATA, but rather rear position in the foot. Consequently, the runner can relax and lean forward without putting unnecessary tension in the trunk [10].

The third is to induce the internal rotation of the hip joint. When we usually walk or run, the foot turns somewhat inward. For the shoes we usually wear, internal rotation may be difficult due to the friction between the sole and the ground. On the other hand, there is an

important part just below the ATA [12]. Here, it is knitted in red color as shown in (Figure 1) so as to recognize this area. It plays a role of smoothly turning the foot inward, in addition to the role of cushioning [13] (Figure 2). Furthermore, the first and second fingers of the foot can hold the strap (thong) tightly with stability for the movement. This movement becomes clarified when the pelvic part is tightly fixed by a wide belt. The back and forth movement of the femur is limited, and the flexion and extension movement of the hip joint is also limited. On the other hand, the movement of the internal and external rotation of the hip joint becomes remarkable. These exercises will make the lower extremities move more smoothly.



Figure 1: Ashinaka (half foot training footwear) which was made by the authors.

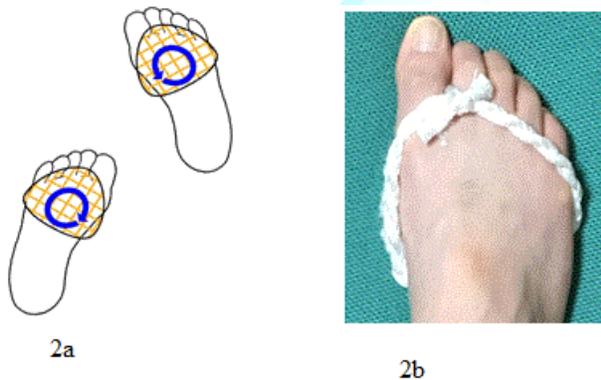


Figure 2: Walking and running of the foot associated with Ashinaka (half foot training footwear). **2a:** Smooth inward rotation of the foot. **2b:** The first and second fingers of the foot can hold the strap (thong) tightly.

In summary, the power to change the society exists in sports, and among them athletics exists as fundamental region. The authors have advised Masters Athletes for better running practices with less injury. In this article, Ashinaka (half foot training footwear) are shown with various usefulness. We hope that this description will become reference for future development.

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