

## Research and Reviews: Orthopedics

# The Important Points in Plantar Region for Relaxed Standing and Running

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### Editorial

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### EDITORIAL

In the light of orthopedic and exercise science, the human body always receives gravity from the earth. Sitting, standing, walking postures are always affected by the gravity. Conversely, the posture in the lying or recumbent position brings the body almost free muscle tension <sup>[1]</sup>. From mentioned above, we can discuss how to stand more efficiently. The recommended posture would be standing freely with relaxation of body and soul. In other words, we can stand supporting on our bones with minimum regulation power of the muscles <sup>[1-3]</sup>.

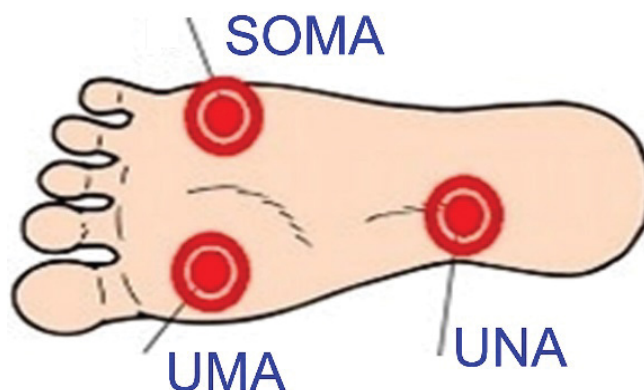
In humans, where is the center of gravity of the body? There are two cases to be discussed. One is the standing position in usual situation. This is basically relaxed comfortable position without muscle contraction of regulating posture <sup>[4]</sup>. In this case, the center of gravity is situated at UNA position just beneath the tibia. On the other hand, there is a posture when the whole body moves and slides forward. In this case, the center of gravity is situated at sole hallucal area (thumball, football) and the base of the second finger of the foot. This is not the usual center, but the temporary center <sup>[5]</sup>.

The authors have continued educational lectures for physical adjustment to healthy people and running method courses that do not hurt Masters Athletes <sup>[6-8]</sup>. Among them, anatomical and physiological fundamental theory and practice in walking and running have been presented <sup>[9]</sup>.

There are three important points on the sole of the foot (**Figure 1**). The details of their origin and characteristic are shown in the following. The explanation includes those names with Japanese and English technical terms <sup>[5]</sup>.

- 1) UNA=U: uchi (medial) +NA: naka (inside). It is situated at the center of the gravity of the body when standing freely with relaxed posture.
- 2) UMA=U: uchi (medial) +MA: mannnaka (middle). It is situated at the MP joint of the first finger of the foot, which is sole hallucal area (thumball, football).
- 3) SOMA=SO: soto (lateral) +MA: mannnaka (middle). It is situated at the MP joint of the fifth finger of the foot.

## Research and Reviews: Orthopedics



**Figure 1: Three Important Points on the Sole of Foot**

When a man tries to stand on the position of UNA with weight on it, the center of gravity will be applied directly above the tibia<sup>[5]</sup>. In that case, he can stand in relax with the minimal tension of the muscles controlling the body's posture<sup>[7]</sup>. In the standing position where the body is relaxed, how to put the center of gravity of the body on the point of UNA is shown below<sup>[5,7]</sup>.

- 1) At first, make the body relax in the standing position.
- 2) Expand both feet to the width of both shoulders, and turn the toes straight ahead.
- 3) Lightly bend your knees and put your weight on the entire plantar region.
- 4) From this status, try to ride your weight just under the external malleolus. Then, the center of gravity will be right above the point of UNA.

This reason will be described. Originally UNA is located at the inside planter region, just under the internal malleolus<sup>[10]</sup>. However, when trying to ride on the point of UNA from the beginning, the center of gravity tends to shift towards the inside direction<sup>[11]</sup>. In this way, the recommended procedure would be (1-4) mentioned above.

On the other hand, there have been recent topics concerning the grounding way in the running<sup>[12]</sup>. They include various arguments about heel contact, toe contact, flat grounding and the grounding way with the foot at open angle and so on<sup>[13]</sup>. In this regard, the authors believe flat landing is the most beneficial for safer way and less injury.

Three points are beneficial when a person is to keep standing position in relaxed condition and also to run adequately in safe method<sup>[8]</sup>. We have taught the important way concerning how to run fast and safe in our lectures and seminars, especially with the relationship of better running and these 3 points<sup>[10]</sup>. The main points are summarized in the following. As the grounding of the foot in the running, planter region is better to touch flatly with the center of gravity at the point of "UNA". In other words, it is not a toe or a heel, but a center of the UNA that a person tries to better and safer grounding. In such case, the idea of triangle would be beneficial, where three points are SOMA, UMA and heel<sup>[14]</sup>. As this triangle, UNA is situated inside the triangle, which corresponds to the point of the center of gravity of the body.

Furthermore, it is also important for the foot to land flat rather than inside or outside grounding. This is because the three arches at the sole function are well in balance and the burdens of the shock are reduced<sup>[15,16]</sup>. The important point here is not to put effort on the toes or not to kick at the toes. One side of the foot triangle and the line connecting the SOMA and UMA show the overlap with the line of the MP joint between 1<sup>st</sup> and 5<sup>th</sup> of the finger of the foot.

In summary, the point of UNA in the planter region plays an important role during standing and running. From the anti-aging medical point of view, a better and safer running has been in discussion, where the flat grounding of the foot would be recommended. We expect that this report would become one of the reference and further development of research in this field would be expected.

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## Research and Reviews: Orthopedics

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