Alignment Changes of Subtalar Joints after Low Tibial Osteotomy for Varus Type Osteoarthritis of the Ankle

Presenting Author:
Akira Taniguchi, MD, PhD
Nara, Japan

Abstract Co-Authors:
1. Yasuhiro Tanaka, MD, PhD
   Nara, Japan
   (n)
2. Shinji Tsukamoto, MD
   Nara, Japan
   (n)
3. Takenori Matsuda, MD
   Nara, Japan
   (n)
4. Satoshi Kamijyo, MD
   Nara, Japan
   (n)
5. Koji Hayashi, MD, PhD
   Nara, Japan
   (n)
6. Tsukasa Kumai, MD, PhD
   Nara, Japan
   (n)
7. Yoshinori Takakura, MD, PhD
   Nara, Japan
   (n)

Summary:
Varus deformity of the ankle joint is compensated by valgus inclination at the subtalar joint. After the low tibial osteotomy (LTO), hindfoot did not show excessive valgus change, maintained an ideal alignment with compensation from the subtalar joint.

Introduction:
The subtalar joint is located at the lowest point in the load axis of the lower extremity, and plays a role in compensating for inversion/eversion deformity of the ankle joint. However, few reports have investigated deviation of the subtalar joint after LTO.

Material and Method:
Fourteen patients (14 feet) who underwent LTO for varus-type osteoarthritis (stage 2, 1 foot; stage 3-a, 13 feet) were investigated between September 1999 and June 2009. Hindfoot alignment was evaluated using weight-bearing subtalar X-ray view before and after surgery. This view allows visualization of the tibial shaft and articular surface of the talar dome and the articular surface of the posterior facet of the calcaneus.

Results:
Angle between the tibial axis and a line on the surface of the ankle joint on the talus (TTS angle) changed from 84.7±3.6° to 94.2±5.7°, and angle between the tibial axis and a line on the surface of the posterior facet of the subtalar joint on the calcaneus (TPC angle) changed from 91.2±8.3° to 98.9±6.9°. Those results indicate that valgus angulation to the tibial axis was obtained. The
difference between TPC angle and TTS angle (SIA angle) changed from 6.5±7.0° to 4.7±4.8° indicating reduced calcaneal valgus inclination to the talus.

**Discussion and Conclusion:**
TTS and TPC angles decreased postoperatively. However, compared with the TTS angle, less change in TPC angles were verified, as a result, the SIA angle reduced. This indicates varus deformity of the ankle joint was corrected after LTO, but the hindfoot did not show excessive valgus change, maintaining ideal alignment with compensation from the subtalar joint.