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**1:12 pm – 1:17 pm****Comparison of Foot and Ankle Segmental Gait Between Total Ankle Replacement and Arthrodesis****Sang Gyo Seo, MD** (*Seoul, South Korea*)

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**Summary**

The TARA increased the range of hindfoot and forefoot segmental motion comparing to ankle arthrodesis. The shape of arch and forefoot became planovalgus in TARA group relatively to arthrodesis group.

**Introduction**

Total ankle replacement arthroplasty (TARA) and ankle arthrodesis are usually performed for severe ankle arthritis. We compared the postoperative differences between two procedures during barefoot gait.

**Methods**

We analyzed the 17 patients undergoing TARA and 7 patients undergoing arthrodesis patients at one institution. The subjects were tested by 3D multi-segment foot model with 15-markers. The temporal gait parameters such as cadence, speed, stride length, step width, step time, and stance phase were calculated. The maximum and minimal values and the difference of 3-planes (sagittal, coronal, transverse) of hallux, forefoot, hindfoot and arch were compared between TARA and arthrodesis. We also analyzed the inter-segmental positions at 8 phases of gait (initial contact, loading response, mid-stance, terminal stance, pre-swing, initial swing, mid-swing, and terminal swing).

**Results**

After TARA, the cadence was faster than arthrodesis. The step width was longer and the step time was shorter in TARA group. According to analyzing of foot and ankle segmental motion, the range of hindfoot sagittal motion was significantly increased in TARA group (15.1 degrees) comparing to arthrodesis group (10.2 degrees) ( $p=0.01$ ). The main component of motion increase was hindfoot dorsiflexion (12.3 degrees, 8.6 degrees) rather than plantar flexion (2.8 degrees, 1.6 degrees), respectively. The motions of hindfoot coronal and transverse plane in TARA were similar to fusion group. The range of the forefoot sagittal motion was increased in TARA group (9.3 degrees than arthrodesis group (5.8 degrees) ( $p=0.005$ ). The difference of forefoot sagittal motion was influenced from initial contact to loading response ( $p=0.001$ ) and pre-swing and initial swing phase ( $p=0.02$ ). The arch was lower and forefoot was more abducted in TARA group during all gait cycle. There was no difference in hallux motion between two groups.

**Conclusion**

The TARA increased the range of hindfoot and forefoot segmental motion comparing to ankle arthrodesis. The shape of arch and forefoot became planovalgus in TARA group relatively to arthrodesis group.