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**INTRODUCTION**

The prosthetic socket is the most important compartment of the prostheses for transfemoral amputees [1]. Nowadays, the ischial containment socket (ICS) and anatomical socket (ANA) have been widely used as prosthetic socket for transfemoral amputee. Some studies have showed differences of biomechanical features between the sockets, such as range of motion of lower limb. Although transfemoral amputees are characterized by gait asymmetry, there have been few studies that investigated gait asymmetry during a gait in real-world environments. The aim of this study was to assess asymmetry of foot plantar pressure in transfemoral amputees during a gait in real-world environment considering prosthetic sockets (ICS)

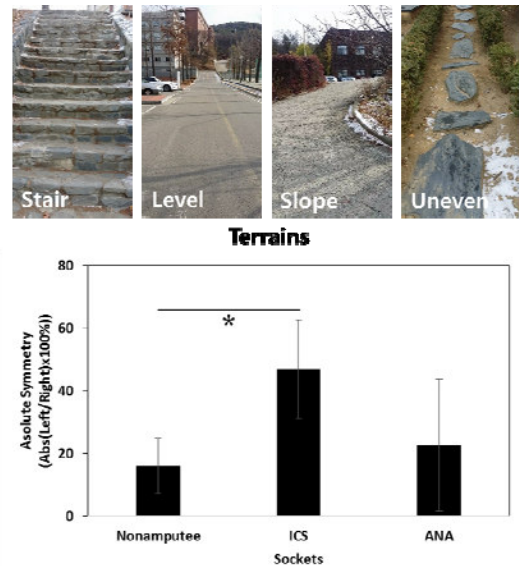
**METHODS**

Seven male transfemoral amputees (174.1 ± 3.9 cm, 81.4 ± 11.0 kg, 46.0 ± 8.8-year-old, # of ICS: 3, # of ANA: 4) and 10 male healthy young adults (176.9 ± 2.5 cm, 72.3 ± 7.9 kg, 24.4 ± 2.0-year-old) were enrolled. A wearable foot pressure insole sensor was placed in the shoe (OpenGO science, Moticon, Germany). Participants were asked to walk at self-selected velocity in real-world environments that consisted of level, slope, stair and uneven terrain for a distance of about 1.6 km (Figure 1.). Asymmetry of foot plantar pressure and temporal parameters between sound and amputated feet and between left and right feet were calculated.

**RESULTS AND DISCUSSION**

Figure. 1 shows the comparison of symmetry of plantar pressure. Transfemoral amputees had higher asymmetry as compared with non-amputee participants. Significantly higher asymmetry in ICS was observed, while no significant differences between non-amputee and ANA was shown. Although there was tendency for greater asymmetry of stance phase in transfemoral amputee, (7.3 % in ICS, 6.4 % in ANA) than non-amputees (3 %), no significant differences were observed among groups (p > 0.05). Significantly larger asymmetry of double stance phase was observed in transfemoral amputees (p < 0.05). However, there were no differences between ICS and ANA (p > 0.05). These results indicate that asymmetry in transfemoral amputees during walking in real-world environments is larger than for non-amputees. Furthermore, the transfemoral socket types appear to affect the magnitude of asymmetry.

In this study, only a few transfemoral amputees were involved which will have impacted the statistical power. Further studies with more subjects are needed.



**Figure 1:** Terrains on real environment and comparison of symmetry of plantar pressure, \*: p < 0.05.

**CONCLUSIONS**

In this study, the asymmetry between sound and amputated limb in transfemoral amputees during walking in real-world environments was evaluated. We confirmed a higher asymmetry in transfemoral amputees. Furthermore, socket type affected the asymmetry.

**ACKNOWLEDGEMENTS**

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