INTRODUCTION

- Standard of care for individuals with a transfemoral amputation is an ischial containment (IC) socket
- Proximal brim of IC socket can cause
  - Discomfort
  - Increased pressure
  - Limited hip range of motion (ROM) [1,2]
- Limited hip ROM during walking can lead to unhealthy compensatory strategies [1]
- Advancements in socket suspension have allowed prosthetists to design sub-ischial (SI) sockets that eliminate ischial containment. Vacuum-assisted socket suspension aims to reduce motion between the residual limb and socket [3].
- Potential concern
  - May affect socket stability (frontal plane relative motion between the socket and the residual limb) during walking [4]
- Potential benefits of SI socket and vacuum-assisted socket suspension
  - Less motion between socket and limb [2]
  - Greater hip ROM
  - Increased comfort during sitting [1,3]
- Self-selected walking speed was overall faster while walking in the IC socket compared to the SI socket. All differences per activity were less than 0.1 m/s.

METHODS

- Inclusion Criteria:
  - 18-45 years old
  - Unilateral transfemoral amputation
  - Residual limb length minimum of 4 inches
  - No prior experience with vacuum-assisted socket suspension
  - Each subject wore an IC socket at enrollment and an SI socket was fabricated for the study

RESULTS

- There was an average 7.8° increase in sagittal plane hip ROM during OG walking in the SI socket as compared to the IC socket. Each subject’s increase in sagittal plane hip ROM was greater than the MDC (3.2°).
- There was an average 4.7° increase in hip ROM during STA in the IC socket compared to the IC socket. MDC not available.
- For all subjects, hip extension increased during both OG walking and STA in the IC socket. Each subject’s increase in sagittal plane hip ROM was greater than the MDC (3.2°).
- There was a consistent preference for the SI socket for activities such as cycling and squats but overall preference for daily use was mixed.
- The results of this study indicate a SI socket may have hip ROM and comfort advantages compared to an IC socket without affecting socket stability. However, an increase in sample size is necessary to determine a clear preference for comfort and daily use.

CONCLUSIONS

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REFERENCES