Use of the Lower Extremity Functional Scale (LEFS) in a Patient After a First Metatarsophalangeal Joint Implant: A Case Report.

Courtney Brinckman, SPT; Kirsten Buchanan PhD, PT, ATC
Physical Therapy Department, University of New England

Unique
First metatarsophalangeal (MTP) total joint implants are uncommon; however, hemi implants have increased in popularity. The HemiCAP® (Franklin, MA) implant resurfaces the metatarsal head while leaving the distal phalanx intact. Early results of the HemiCAP® implant surgery have been promising, physical therapy outcome measures such as the LEFS have not been extensively studied in this population.

The Lower Extremity Functional Scale (LEFS) is a sensitive and reliable outcome measure that has commonly been used in patients with hip and knee dysfunction. While the LEFS has been used for a broad spectrum of lower-extremity pathologies, there is a paucity of research that investigates the use of LEFS in patients who have had a first MTP joint implant.

Purpose
The purpose of this case report was to investigate the use of LEFS in a patient with first MTP HemiCAP® joint implant.

Foundation
- Arthritis is most frequently cited chronic disease in the United States and hallux rigidus is the most common form of arthritis in the foot.
- First MTP joint replacements have a tendency to fail over time due to the significant amount of force through the 1st MTP with each step.
- HemiCAP DF® incorporates an anatomic, extended dorsal curve on the first metatarsal to improve dorsal roll-off while preventing osteophyte regrowth.
- In a study of 27 great toes in 25 patients, Aslan et al (2012) found that the HemiCAP® resurfacing implant was successful in improving range of motion (ROM), function, and pain scores 37 weeks after surgery.
- The LEFS has strong reliability and validity and is easy to administer and score in patients with a wide range of conditions and disability levels.

Description
- The patient was a 56 year-old male with bilateral pes planus.
- The patient reported a 9 year history of hallux rigidus in the right 1st MTP.
- Conservative treatment did not decrease symptoms and the patient underwent surgery for a 1st MTP HemiCAP® arthroplasty implant.
- A systems review 9 weeks after surgery revealed impairments of right great toe range of motion, strength and balance.
- Tests and measures included gait assessment, goniometric range of motion, manual muscle testing (MMT), and the LEFS.
- The patient was seen for 45-60 minutes/session, 2x/week for 4 weeks.
- Physical therapy intervention included balance exercises, toe and ankle stretching and strengthening, and joint mobilizations of the first MTP.
- Gait training prioritized weight shift, equal step length and push off over level surfaces with the use of a mirror for visual feedback.
- A written home exercise plan was included that reinforced the above interventions.
- The patient’s goals were to walk normally and return to golf.

Observation
- Right 1st MTP flexion improved from 5° to 10° both actively and passively.
- Right first MTP extension improved from 20° actively and 30° passively to 10° both actively and passively.
- This compared to left 1st MTP active range of motion of 10° flexion and 10° extension.
- MMT of the right flexor hallucis longus and brevis improved from 4/5 to 5/5.
- MMT of right extensor hallucis longus and brevis improved from 4/5 to 4/5.
- Plantarflexor strength improvement of 4/5 to 5/5.
- Pt improved from 0 to 45 seconds in single limb stance from initial evaluation to discharge.
- LEFS score improved from 60/80 to 73/80, showing a clinically important difference.

Conclusions
This case report suggested that the use of the LEFS outcome measure was beneficial when assessing a patient who had a 1st MTP HemiCAP® arthroplasty implant. Future research should investigate the use of the LEFS in larger populations of patients with foot and ankle pathologies.

References and Acknowledgements