

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

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## Unique

First metatarsophalangeal (MTP) total joint implants are uncommon; however, hemi implants have increased in popularity.<sup>1</sup> The HemiCAP® (Franklin, MA) implant resurfaces the metatarsal head while leaving the distal phalanx intact.<sup>1</sup> While 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.<sup>2</sup>

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.<sup>3</sup> 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

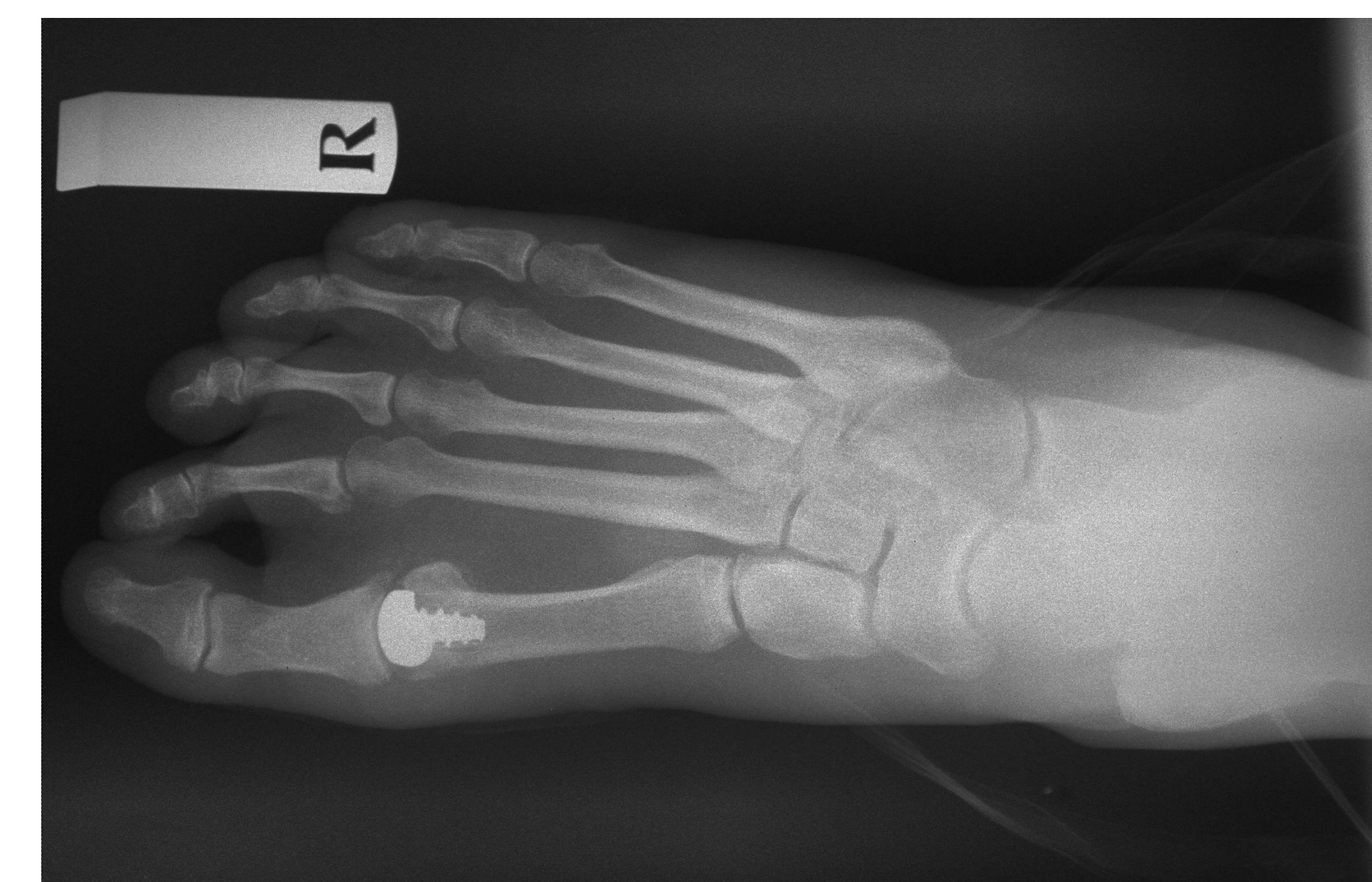


Figure 1: Resurfacing of the first MTP with the HemiCAP DorsiFlexion Implant System.<sup>9</sup>

- Arthritis is most frequently cited chronic disease in the United States<sup>4,5</sup> and hallux rigidus is the most common form of arthritis in the foot.<sup>6</sup>
- First MTP joint replacements have a tendency to fail over time due to the significant amount of force through the 1<sup>st</sup> MTP with each step.<sup>7</sup>
- HemiCAP DF® incorporates an anatomic, extended dorsal curve on the first metatarsal to improve dorsal roll-off while preventing osteophyte regrowth.<sup>8</sup>
- 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.<sup>2</sup>
- 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.<sup>3</sup>

## 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 1<sup>st</sup> MTP.
- Conservative treatment did not decrease symptoms and the patient underwent surgery for a 1<sup>st</sup> MTP HemiCAP® arthroscopic implant.<sup>1</sup>
- 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.



Top: Medial aspect of right foot  
Bottom: Post-surgical x-ray of right foot



Above: Dorsal surface of right foot

## Observation

- Right 1<sup>st</sup> MTP flexion improved from 5° to 10° both actively and passively.
- Right first MTP extension improved from 20° actively and 30° passively to 40° both actively and passively.
- This compared to left 1<sup>st</sup> MTP active range of motion of 10° flexion and 40° 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.<sup>1</sup>

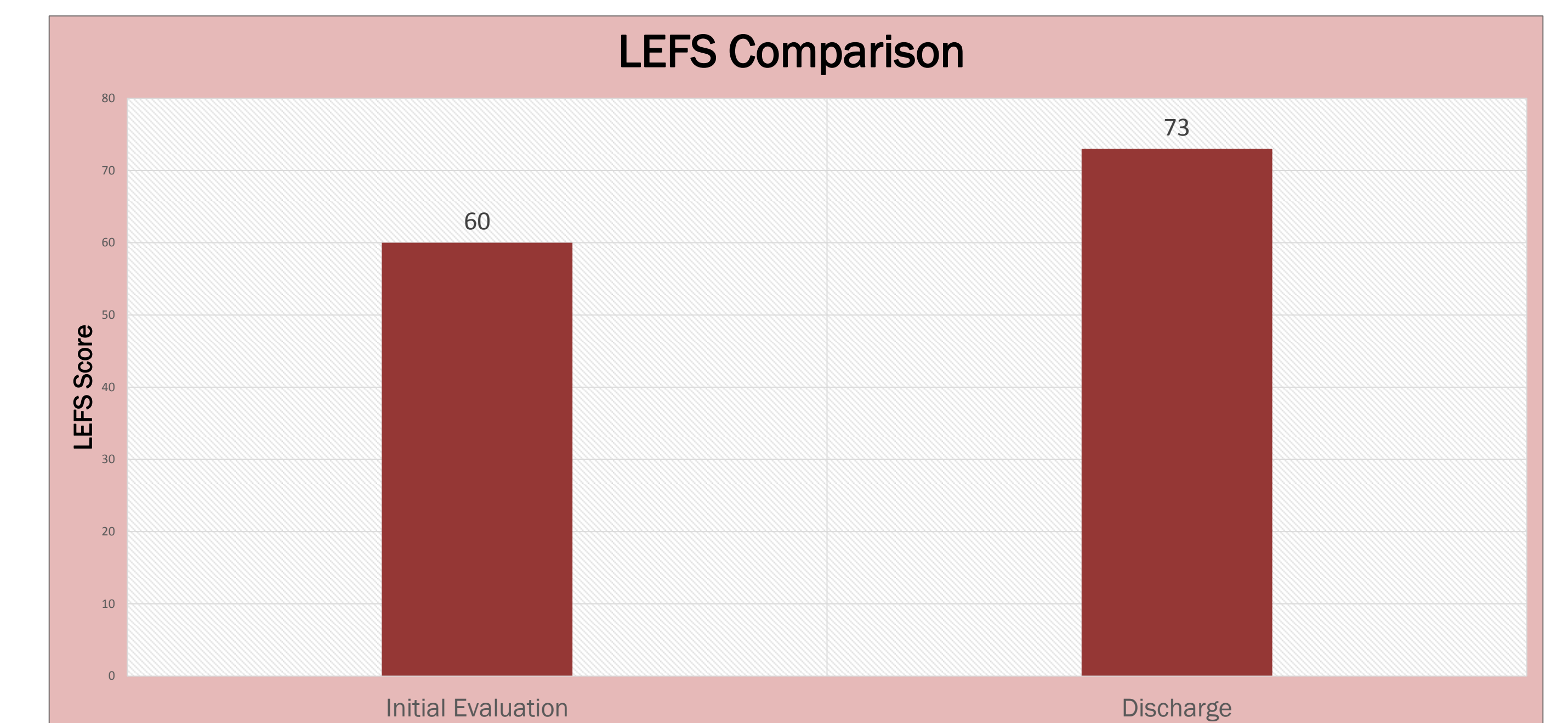


Figure 2: Comparison of LEFS Scores

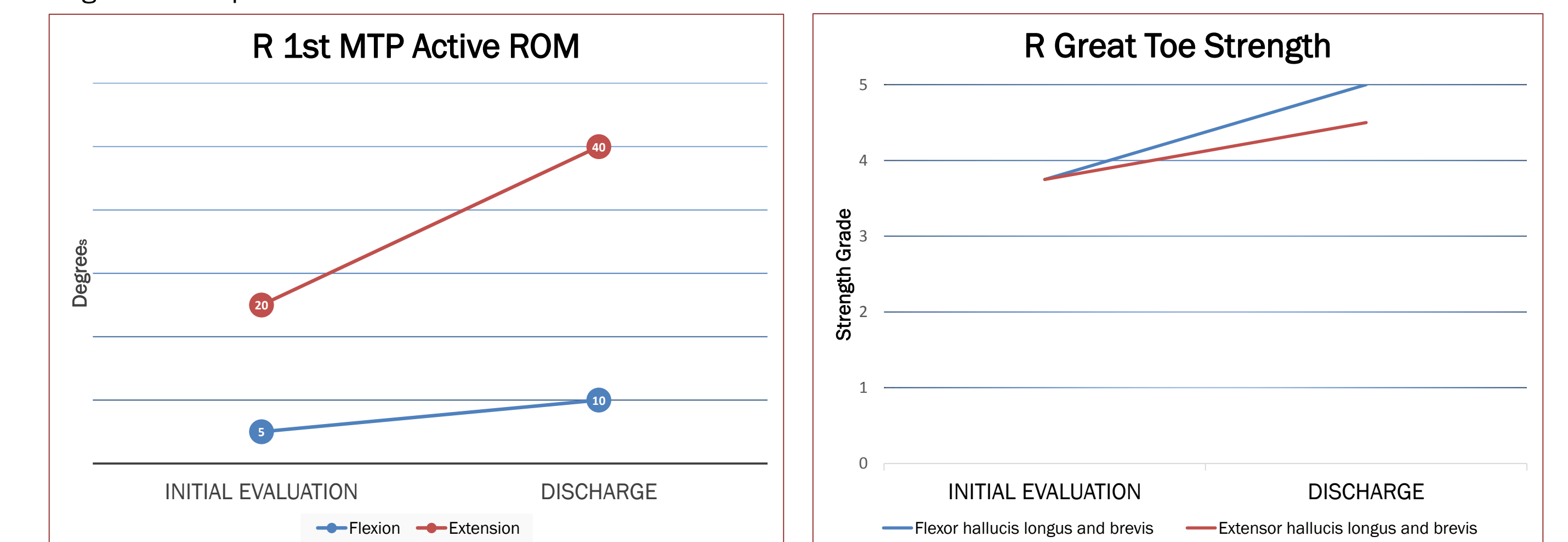


Figure 3: Comparison of R 1<sup>st</sup> MTP ROM Measurements

Figure 4: Comparison of 1<sup>st</sup> Ray MMT Grades

## Conclusions

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

## References and Acknowledgements

1. Metten D. Current Insights On First MTP Implants. *Podiatry Today*. 2012;14(10). Available at: <http://www.podiatrytoday.com/content/view/full/1410101010>. Accessed September 20, 2013.
2. Aslan H. Early results of First MTP resurfacing implant. *Foot and Ankle International*. 2012;33(11):1212-1216. Available at: <http://dx.doi.org/10.31774/journal.footankle.2012.33.11.1212>.
3. Bekke J, Swartz P, Lee S, Balke D. The Lower Extremity Functional Scale (LEFS): scale development, measurement properties, and clinical application. *North American Journal of Rehabilitation Research*. 2008;45(1):10-17.
4. Clegg D. *Arthritis*. In: *Arthritis*. Philadelphia: Elsevier; 2011:10-15.
5. Clegg D. *Arthritis*. In: *Arthritis*. Philadelphia: Elsevier; 2011:10-15.
6. Liaw K. *Arthritis*. In: *Arthritis*. Philadelphia: Elsevier; 2011:10-15.
7. D'Antonio J. *Arthritis*. In: *Arthritis*. Philadelphia: Elsevier; 2011:10-15.
8. *Podiatry Today*. An American Orthotic Society Publication. Available at: <http://www.podiatrytoday.com/content/view/full/1410101010>. Accessed September 20, 2013.
9. *Podiatry Today*. An American Orthotic Society Publication. Available at: <http://www.podiatrytoday.com/content/view/full/1410101010>. Accessed September 20, 2013.