Treatment of Phantom Limb Pain: Incorporating Intuitive Use of Imagery Into the Graded Motor Imagery Program

K Baun, MPH OTR/L, J Peterson, MA PT, T Ryan, MOT OTR/L CSCS
Advanced Arm Dynamics

INTRODUCTION

Phantom limb sensation and phantom limb pain (PLP) are common experiences in the amputee population, with reported incidence of PLP in up to 80% of cases and resulting permanent disability in upwards of 40% of patients (Lotze, 2001). Over the past decade, a new technique called Graded Motor Imagery (GMI) has been developed as a means of providing relief for persistent pain states including PLP for both upper and lower extremity amputees. GMI is based on the concept of central sensitization and intended to impact cortical reorganization that occurs with PLP (Moseley and Flor, 2012). GMI involves 3 phases that are performed sequentially beginning with left/right discrimination exercises then observing and imagining positions and movement of the affected limb and finally mirror therapy. These phases build implicit and explicit imagery skills which result in diminished PLP. Two case studies will be presented that describe patients who intuitively used imagery techniques (prior to introduction to GMI), and as a result, were successful at moving directly to the final phase of GMI to further diminish PLP.

METHOD

Two patients were interviewed at evaluation and at a subsequent visit. Mirror therapy was performed with both patients. Responses to interview questions were analyzed and compared with current GMI procedures as described in the Graded Motor Imagery Handbook (Moseley, 2012), a more formal GMI approach was initiated and recommendations for treatment continuation with GMI were made.

RESULTS

The first patient interviewed sustained a left transhumeral amputation secondary to an MVA 43 years ago. Fifteen to twenty years post injury the patient began intuitively practicing imagery techniques, essentially GMI phase 2. Along with a sensation of his limb lengthening, came a reduction in PLP. Frequency of PLP decreased and intensity of pain changed from 8/10 to 2/10. Right/left discrimination (GMI phase 1) was subjectively evaluated and found intact for both speed and accuracy as compared with the evaluator. As a way to further decrease PLP, the patient was instructed in a GMI program and was readily able to participate in mirror therapy. The second patient sustained a right wrist disarticulation amputation following a traumatic workplace injury in 2011. On initial evaluation, the patient reported PLP as 8/10, occurring multiple times per day. Narcotic pain medication was used every 4 hours for pain relief. On follow up, this patient reported that he could control phantom pain by thinking about moving his right hand (GMI Phase 2). He currently reports phantom pain occurring twice per day and lasting approximately 30-60 seconds with an intensity of 8/10. He has reduced medication use to 2 times per day. Due to his natural use of motor imagery, the patient was able to successfully begin mirror therapy (phase 3) of a GMI program.

DISCUSSION

A growing body of evidence points to the effectiveness of Graded Motor Imagery for the treatment of PLP (Moseley 2003; Moseley 2006; Priganc 2011). Based on the case studies presented, patients may be successfully decreasing PLP by intuitively using imagery, akin to phase 2 of GMI, and may therefore progress directly to phase 3 of a GMI program to further reduce PLP. Of interest for future study will be outcomes for the two patients presented using GMI, exploring this approach with a greater number of patients and tracking the incidence of intuitive use of imagery among the amputee population.

CONCLUSION

It is recommended that patients with PLP follow the GMI treatment progression. However, patients that are naturally performing imagery comparable to phase 2 of GMI, may progress more quickly to phase 3, mirror therapy. Ascertaining a patient's practice of imagery techniques through thorough evaluation interviewing and follow up can expedite and improve PLP management and appropriate integration into a GMI program for optimal relief of PLP.

CLINICAL APPLICATIONS

PLP may be decreased more efficiently and effectively through integration of existing imagery practice into a GMI program.

REFERENCES

Lotze, M. et al. Brain 2001; 124, 2268-2277.
Moseley, L. et al. The Graded Motor Imagery Handbook. 2012.
Moseley, L & Flor, H. Neurorehab Neural Repair. 2012;Feb: 1-7.
Priganc, V & Stralka, S. J Hand Ther 2011; 24: 164-9.

American Academy of Orthotists & Prosthetists
39th Academy Annual Meeting and Scientific Symposium
February 20-23, 2013