

ORIGINAL RESEARCH

EFFECTS OF FOREFOOT RUNNING ON CHRONIC EXERTIONAL COMPARTMENT SYNDROME: A CASE SERIES

MAJ Angela R. Diebal, PT, DPT¹Dr. Robert Gregory, PhD²COL Curtis Alitz, MD³LTC J. Parry Gerber, PT, PhD^{1,4}

ABSTRACT

Introduction: Chronic exertional compartment syndrome (CECS) is a condition that occurs almost exclusively with running whereby exercise increases intramuscular pressure compromising circulation, prohibiting muscular function, and causing pain in the lower leg. Currently, a lack of evidence exists for the effective conservative management of CECS. Altering running mechanics by adopting forefoot running as opposed to heel striking may assist in the treatment of CECS, specifically with anterior compartment symptoms.

Case Description: The purpose of this case series is to describe the outcomes for subjects with CECS through a systematic conservative treatment model focused on forefoot running. Subject one was a 21 y/o female with a 4 year history of CECS and subject two was a 21 y/o male, 7 months status-post two-compartment right leg fasciotomy with a return of symptoms and a new onset of symptoms on the contralateral side.

Outcome: Both subjects modified their running technique over a period of six weeks. Kinematic and kinetic analysis revealed increased step rate while step length, impulse, and peak vertical ground reaction forces decreased. In addition, leg intracompartmental pressures decreased from pre-training to post-training. Within 6 weeks of intervention subjects increased their running distance and speed absent of symptoms of CECS. Follow-up questionnaires were completed by the subjects at 7 months following intervention; subject one reported running distances up to 12.87 km pain-free and subject two reported running 6.44 km pain-free consistently 3 times a week.

Discussion: This case series describes a potentially beneficial conservative management approach to CECS in the form of forefoot running instruction. Further research in this area is warranted to further explore the benefits of adopting a forefoot running technique for CECS as well as other musculoskeletal overuse complaints.

Key Words: anterior compartment syndrome, fasciotomy, forefoot running, shin splints.

¹ Keller Army Community Hospital, West Point, NY, USA

² Assistant Professor, Biomechanics, United States Military Academy, West Point, NY, USA

³ Orthopedic Surgeon, Keller Army Community Hospital, West Point, NY, USA

⁴ Baylor University, Waco, TX, USA

IRB approval was granted for the study protocol by Keller Army Community Hospital on 5 OCT 2010

This research was conducted at the United States Military Academy, West Point, NY. At the time of the research, MAJ Diebal was completing a post professional sports medicine physical therapy residency under the mentorship of Dr. Gerber as well as

completing her DScPT in Physical Therapy from Baylor University, Waco TX. The opinions or assertions contained herein are the private views of the authors and are not to be construed as official or as reflecting the views of the US Army, the Department of Defense, or the United States Government.

CORRESPONDING AUTHOR

MAJ Angela Diebal

Keller Army Community Hospital
West Point, NY 10996Email: angie.diebal@us.army.mil