

Effect of Normal Gait on *In Vivo* Tibiofemoral
Cartilage Strains

Nimit K. Lad, Betty Liu, Pramodh K. Ganapathy,
Gangadhar M. Utturkar, E. Grant Sutter, Claude T.
Moorman, William E. Garrett, Charles E. Spritzer,
Louis E. DeFrate



PII: S0021-9290(16)30707-2
DOI: <http://dx.doi.org/10.1016/j.jbiomech.2016.06.025>
Reference: BM7779

To appear in: *Journal of Biomechanics*

Received date: 21 January 2016
Revised date: 10 June 2016
Accepted date: 23 June 2016

Cite this article as: Nimit K. Lad, Betty Liu, Pramodh K. Ganapathy, Gangadha
M. Utturkar, E. Grant Sutter, Claude T. Moorman, William E. Garrett, Charles
E. Spritzer and Louis E. DeFrate, Effect of Normal Gait on *In Vivo* Tibiofemora
Cartilage Strains, *Journal of Biomechanics*
<http://dx.doi.org/10.1016/j.jbiomech.2016.06.025>

This is a PDF file of an unedited manuscript that has been accepted for
publication. As a service to our customers we are providing this early version of
the manuscript. The manuscript will undergo copyediting, typesetting, and
review of the resulting galley proof before it is published in its final citable form.
Please note that during the production process errors may be discovered which
could affect the content, and all legal disclaimers that apply to the journal pertain

EFFECT OF NORMAL GAIT ON *IN VIVO* TIBIOFEMORAL CARTILAGE STRAINS

Nimit K. Lad¹, Betty Liu^{1,2}, Pramodh K. Ganapathy¹, Gangadhar M. Utturkar¹, E. Grant Sutter¹, Claude T. Moorman¹, William E. Garrett¹, Charles E. Spritzer³, Louis E. DeFrate^{1,2*}

¹Duke Sports Medicine Center, Department of Orthopaedic Surgery, Duke University Medical Center, Durham, North Carolina, USA

²Department of Biomedical Engineering, Duke University, Durham, North Carolina, USA

³Department of Radiology, Duke University Medical Center, Durham, North Carolina, USA

*Corresponding author at: 379 Medical Sciences Research Building, Box 3093 Duke University Medical Center, Durham, NC 27710. Tel.: +919 681 9959; fax: +919 668 3422.

E-mail: lou.defrate@duke.edu

Abstract

Altered cartilage loading is believed to be associated with osteoarthritis development. However, there are limited data regarding the influence of normal gait, an essential daily loading activity, on cartilage strains. In this study, 8 healthy subjects with no history of knee surgery or injury underwent magnetic resonance imaging of a single knee prior to and following a 20-minute walking activity at approximately 1.1 m/s. Bone and cartilage surfaces were segmented from these images and compiled into 3-dimensional models of the tibia, femur, and associated cartilage. Thickness changes were measured across a grid of evenly spaced points spanning the models of the articular surfaces. Averaged compartmental strains and local strains were then calculated. Overall compartmental strains after the walking activity were found to be significantly different from zero in all four tibiofemoral compartments, with tibial cartilage strain

Download English Version:

<https://daneshyari.com/en/article/5032464>

Download Persian Version:

<https://daneshyari.com/article/5032464>

[Daneshyari.com](https://daneshyari.com)