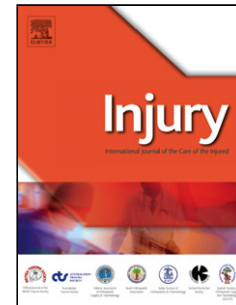


Accepted Manuscript

Title: Implications of three-dimensional modeling of the proximal femur for cephalomedullary nailing: An Asian cadaver study

Authors: Chang-Soo Chon, Bokku Kang, Han Sung Kim, Gu-Hee Jung



PII: S0020-1383(17)30428-X
DOI: <http://dx.doi.org/doi:10.1016/j.injury.2017.07.009>
Reference: JINJ 7299

To appear in: *Injury, Int. J. Care Injured*

Received date: 19-2-2017
Revised date: 24-6-2017
Accepted date: 9-7-2017

Please cite this article as: Chon Chang-Soo, Kang Bokku, Kim Han Sung, Jung Gu-Hee. Implications of three-dimensional modeling of the proximal femur for cephalomedullary nailing: An Asian cadaver study. *Injury* <http://dx.doi.org/10.1016/j.injury.2017.07.009>

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 proof before it is published in its final 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.

Implications of three-dimensional modeling of the proximal femur for cephalomedullary nailing: An Asian cadaver study

Computational analysis of virtual CM nailing

Chang-Soo Chon¹, Bokku Kang¹, Han Sung Kim¹ and Gu-Hee Jung^{✉2}

(1) Department of Biomedical Engineering, Yonsei University, Wonju, Gangwon-Do, 26493, Korea

(2) Department of Orthopaedic surgery, Gyeongsang national university Changwon hospital, 1, Samjeongja-ro, Seongsan-gu, Changwon-si, Gyeongsangnam-do, 51472, Republic of Korea

✉ Gu Hee Jung

E-mail: jyujin2001@hotmail.com

Tel.: +82.55-214-3822

Abstract

Purpose: To determine the variability in the ideal entry point of cephalomedullary (CM) nail around the greater trochanter (GT) and the consequent conformity with the proximal femur by analyzing three-dimensional (3D) modeling and virtual implantation

Materials and Methods: A total of 105 cadaveric femurs (50 males and 55 females) underwent continuous 1.0 mm slice computed tomography (CT) scans. CT images imported into Mimics[®] software to reconstruct the 3D model of the proximal femur and medullary canal. PFNA-II[®] was processed into a 3D model using a 3D-sensor at the actual size and optimally implanted in the proximal femur model using Mimics[®] software. The ideal entry point, nail conformity with the proximal femur, and the relationship between the entry point and adjacent structures were assessed.

Results: The ideal entry point was located a mean of 2.38 mm (SD, 3.53 mm) medial to the tip of GT. No lateral cortex impingement of the proximal femur occurred in the coronal plane based on the recommended point. However, a disparity in the sagittal plane between the proximal shaft and nail curvature was found in 47 models (44.8%). Rotation and magnification of the 3D model exposed all nails above the surface of the medial side of the GT. The proximal nail end was

Download English Version:

<https://daneshyari.com/en/article/5652414>

Download Persian Version:

<https://daneshyari.com/article/5652414>

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