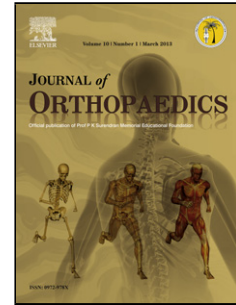


Accepted Manuscript

Title: Healing of femoral fractures by the meaning of an innovative intramedullary nail

Author: V. Filardi

PII: S0972-978X(17)30316-1
DOI: <https://doi.org/10.1016/j.jor.2018.01.011>
Reference: JOR 430



To appear in:

Received date: 5-9-2017
Accepted date: 12-1-2018

Please cite this article as: V.Filardi, Healing of femoral fractures by the meaning of an innovative intramedullary nail (2010), <https://doi.org/10.1016/j.jor.2018.01.011>

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.

Healing of femoral fractures by the meaning of an innovative intramedullary nail

V. Filardi

CARECI - University of Messina, Via consolato del mare 41, 98121, Messina - ITALY
vfilardi@unime.it - +390906768268

Abstract

In this paper, an innovative design of nail, conceived to heal fractures of long bones has been investigated. Its functioning is based essentially on sliding of conical surfaces located in a spindle and in a series of holding pins radially disposed around it. Spindle and holding pins are connected together by means of a sleeve. Medial and distal screws are not necessary. Rotational and longitudinal motions of the spindle are transformed in a radial expansion of the holding pins by the sliding of conical surfaces. A complete numerical FE model of an implanted femur was realized and analyzed by the mean of two loading configurations: LC1 by imposing a vertical load of 980 N, and LC2 by considering resultants of the muscle actions. Analyses confirmed results, in terms of mechanical performances, comparable with the others traditional systems of prosthesis.

Keywords: *intramedullar nail, femur, CAD, FE analysis*

1. Introduction

Generally, fractures are treated with a conservative approach, which involves the immobilization, by cast bandage. However, when it is necessary to stabilize the skeletal segments employing mechanical devices, applied because of a surgical intervention. Osteosynthesis is applied in the following cases:

- *Whenever a conservative approach cannot guarantee satisfactory results,*
- *When the fracture requires immediate surgical repair,*
- *When the cast bandage treatment appears to be too long and cause of degeneration,*
- *When the cast bandage could limit autonomy or self-management of the patient.*

Pseudarthrosis is defined as the non-union of a fracture within about six months after the traumatic event, and can occur in those areas where the correct blood supply is lacking. Some bones can be

Download English Version:

<https://daneshyari.com/en/article/8720388>

Download Persian Version:

<https://daneshyari.com/article/8720388>

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