

Intramedullary implants for osteosynthesis of long bones

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Abstract

Purpose: *The goal of the monograph is to assess the issues in the construction of long bone intramedullary implants in the area of construction, and materials used in their manufacturing, as well the presentation of the implants developed by the authors. In the monograph outline of the long bones structure, the mechanical aspects of the femur and hip fracture, and osteosynthesis problems of long bones are presented. An analysis of the material and structural aspects of intramedullary implants in the area of: the issue stabilize fractures of the long bones, the femur mechanical loads, characterization of biomaterials, methods of bonding biomaterials, intramedullary nailing design and the new concept of their design.*

Design/methodology/approach: *The outline of the structure of the long bones, the mechanical aspects of the femur and hip fracture osteosynthesis problems of long bones. The stability problems of long bone fractures was defined, intramedullary implant design development, and problems of issues design as well the choice of materials for implants. There have been*

analyzing the possibility of welding methods of biomaterials and implants components in the osteosynthesis.

Findings: *The original achievement of the monograph is the development of new design concepts with innovative ways to implant locking nail in the bone. In the design of intramedullary implant for osteosynthesis of the femur with a separate positioning anchoring of the proximal and distal bone structure rather than weaken the locking screws used non-invasive intramedullary stabilization system.*

Research limitations/implications: *The proposed solution design intramedullary implant for osteosynthesis of the femur with a separate positioning anchoring of the proximal and distal relate mainly to stabilize fractures of the long bones diaphysis.*

Practical implications: *It is expected, after the detailed studies, the start of production intramedullary implants for osteosynthesis of the femur with the proposed separate positioning anchoring of the proximal and distal are used mainly to stabilize fractures of the long bones diaphysis.*

Originality/value: *Assessment of the structure intramedullary implants current state of art used in their construction materials, and the analysis of the possibilities of the joining techniques application to simplify their technology, and consider the new possibilities of the implants design solutions determine the importance of the monograph.*

Keywords: *Construction of intramedullary implants; Fracture of the femur; The long bone fracture stabilization; Bio-materials; Welding technology*

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