Intramedullary Nail and Fixation Plate Coated with Biodegradable and Osteoinductive Pure Mg or Its Alloys for Enhancing Bone Fracture Repair

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Technology description

The Technology

Bone fracture is a common medical condition in which there is a break in the continuity of the bone. The non-unions occur in 5-10% of fractures and are characterized by the failure to heal without further intervention. Magnesium (Mg) is an important bivalent ions associated with the formation of bioactive apatite, and it is thus an important factor for bone metabolism. Degraded elements (e.g. Mg ions) products during degradation of pure Mg or its alloys could lead to bone cell activation followed by the increased bone formation. We have developed novel titanium or steel fracture fixation devices coated with biodegradable and osteoinductive pure Mg or Mg alloy for enhancement of bone fracture healing. This innovative approach will facilitate better healing and earlier removal of the fixation nail or plate therefore earlier recovery and reduction of complications as well as costs associated with delayed healing or fracture non-union. This invention have profound impact on innovation of orthopaedic implants and significant contribution to our orthopeadic community, especially to benefit patients with difficult fracture repair such as in patients with osteoporosis and osteonecrosis.

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