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Plenary Lecture

DESIGNING INTRAMEDULLAR POSTS FOR VETERINARY APPLICATIONS

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Summary: The objective of this study is to describe the development of a low cost interlocking nail for young calves. Biomechanical parameters were measured for the numerical analysis of the bovine femoral reduction system. Different polymeric and composite in silico materials were tested to investigate their mechanical performance . analyze polyacetal (POM), polypropylene (PP), polyamide (PA) and a glass fiber-reinforced polymer (GFRP) Twelve femur models, divided into three groups, each one associated with a different fixation strategy, were used for simulation of an oblique simple fracture. Model loading conditions corresponded to a calf in the transition (decubitus position to static position). The most critical stresses in the implant were found in the screws and at the interface between screw and nail. A numerical model demonstrated that all polymeric materials analyzed provided sufficient resistance to tolerate the loading forces imposed on the femur when an adequate fixation strategy was applied. After testing the biocompatibility of the material, in vivo tests were conducted to validate the proposed design. Preliminary results indicate the efficiency of the proposed nail design.