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Biomechanical analysis of patient-specific femur model of osteogenesis imperfecta with cortical and cancellous bone (Conference Paper) (Open Access)

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Abstract

Osteogenesis imperfecta (OI) is a fragile bone disease characterized by easy fractures. The femur consists of cortical and cancellous bone, each with different mechanical properties. Bone fractures often occur throughout patients' lifetime. However, doctors still have no quantitative method to predict fractures. This project's purpose is to investigate the mechanical behaviour of patient-specific OI femur from the finite element analysis. The fracture risk in daily activities (ADL) were examined. All the stress values were judged by the fracture criteria, assumed as 115 MPa. The exercises that exerted force more than 6 times of body weight could cause fractures. Cancellous bone was not affected in any case of ADL. The effects of force and stress on cancellous bone and its impact on fracture risk are negligible. © Published under licence by IOP Publishing Ltd.

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