Stress in the hip joint articular surface during gait

Marija Ipavec

Department of Orthopedic Surgery, Medical Faculty, University of Ljubljana, SI-61000 Ljubljana, SLOVENIA

Vera Kralj - Iglič

Institute of Biophysics, Medical Faculty, University of Ljubljana, SI-61000 Ljubljana, SLOVENIA

Aleš Iglič

Faculty of Electrical and Computer Engineering, University of Ljubljana, SI-61000 Ljubljana, SLOVENIA; Jozef Stefan Institute, University of Ljubljana, SI-61000 Ljubljana, SLOVENIA

SUMMARY

A mathematical model is developed for calculating the stress distribution in the weight bearing area of the hip joint. Stress in the hip joint is analyzed during gait. For each phase of the gait considered it is determined where stress attains its peak value on the weight bearing area and also what is the peak value of stress. It is concluded that the position of the peak stress is close to the superior acetabular rim. The values of peak stress range from 0.8 MPa in the one-limb stance phase to 2.6 MPa in the heel strike phase. Due to its simplicity the model can be used in everyday clinical practice.