Customized Hip Implant Testing Using Gait Cycle for Normal Walking and Walking Up and Down Stairs.

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Custom-made or patient specific implant is the need of the hour as standard implant available on the shelf fails in the long run. There is need of testing of customized implant for dynamic activities like normal walking and walking up and down stairs

In this paper, experimental model of customized hip implant is developed to find out the strains and stresses in the hip implant. The finite element analysis is also performed under normal walking and walking up and down stairs. For creating a CAD model of an implant, the dimensions were obtained from the hip joint radiograph of the patient and load is applied as per gait cycle. The comparison between finite element analysis and experimental result is carried out. This study also proposes multiple linear regression models to predict the maximum stress during human activities like normal walking and walking up and down stairs for customized implant.

Keywords: Customized implant, Gait cycle, Testing, Finite element analysis, Regression model