

## Analysis of Location of defects near geometric discontinuities on the Mechanical Behaviour of Bone Cement

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**Abstract:** The objective of this study was to analyze, by the finite element method by the commercial code Abaqus 6.11 software, the stress level in the PMMA binder the prosthesis to the acetabulum and the inter-microvoids interaction effects on the mechanical behaviour bone cement. The interface and the free edges are stress concentration seats. At these sites, we assumed the location of microvoids. The interaction of the stress fields of these defects with the free edge and the cement-bone interface generates a significant concentration of shear stress priming generally to the free edges of the structure (Fig. 1).

**Keywords:** shear stress, cement bone, free edge, microvoid, finite element analysis.

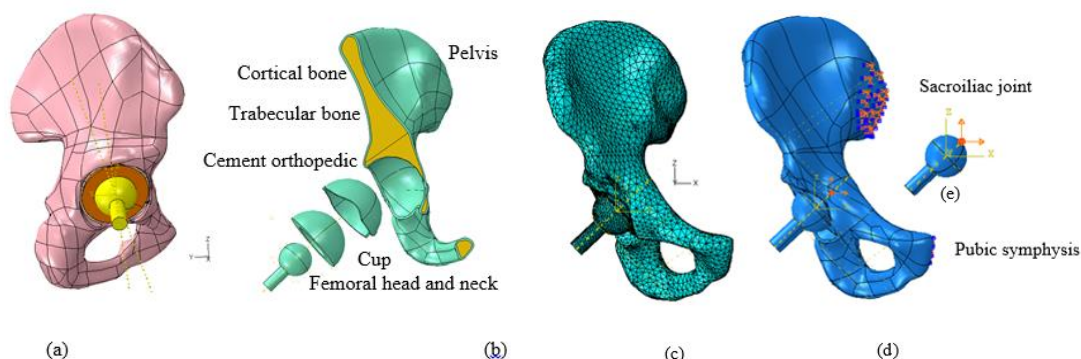


Fig. 1: Composition of a reconstructed acetabulum. (a) Latero-medial view of the solid model, (b) Antero-posterior view of the pelvis and acetabular component, (c) Boundary condition and directions of forces applied to the center of femoral head, (c) Meshed model of the pelvis and acetabular component, (e) The three force components medial ( $F_x$ )-ventral ( $F_y$ )-proximal ( $F_z$ ) at the femoral head.

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