

Abstract Submitted
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Simulation of a flow around biting teeth HIDEAKI NARUSAWA, Showa University, ERIKO YAMAMOTO, KUNIO KUWAHARA, Institute of Computational Fluid Dynamics — We simulated a flow around biting teeth. The decayed tooth is a disease that a majority of people are annoyed. These are often generated from a deep groove at occlusal surface. It is known that a person who bites well doesn't suffer from a decayed tooth easily. Biting forces reach as much as 60 kg/cm^2 by an adult male, and when chewing, upper and lower teeth approach to bite by those forces. The crushed food mixed with saliva becomes high viscosity fluid, and is pushed out of ditches of teeth in the direction of the cheek or the tongue. Teeth with complex three dimension curved surface are thought to form venturi at this time, and to generate big pressure partially. An excellent dental articulation will possibly help a natural generation of a flow to remove dental plaque, i.e. the cause of the decayed tooth. Moreover, the relation of this flow with the destruction of the filled metal or the polymer is doubted. In this research, we try to clarify the pressure distributions by this flow generation as well as its dynamics when chewing. One of our goals is to enable an objective design of the shape of the dental fillings and the artificial tooth. Tooth has a very small uneven ground and a bluff body. In this case, to calculate a computational numerical simulation to solve the Navier-Stokes equations three dimension Cartesian coordinate system is employed.

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