ture base and mucosa was simulated.

MATERIALS AND METHODS

A 2-dimensional model, which included the occlusion rim, mucosa, cortical bone, and cancellous bone, was used as the contrast model, namely the Connected model. (Fig. 1) The thickness of the mucosa was 1.5 mm, and that of the cortical bone was 2.0 mm.

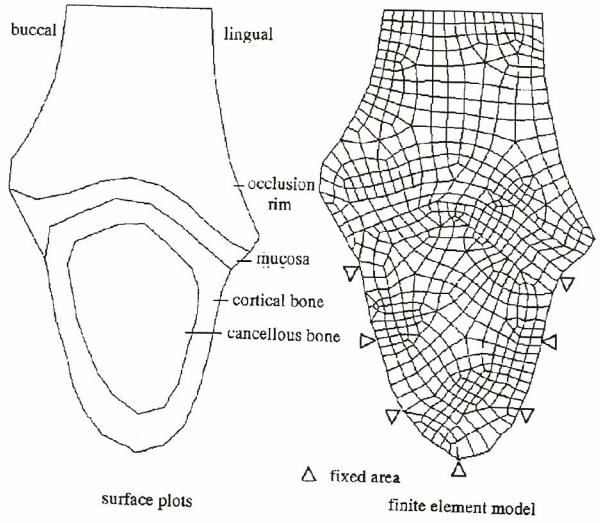

Fig. 1. Surface plots and a finite element model for the Connected model.

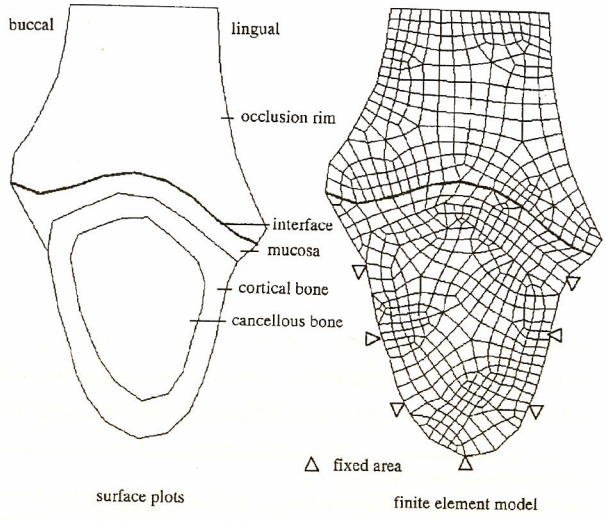

Fig. 2. Surface plots and a finite element model for the Separated model.

The Connected model for finite element analysis contained 723 nodes and 576 elements.

In order to simulate the contact relation between the tissue surface of the occlusion rim and the mucosa, contact elements including gap elements and truss elements were applied. The space between the occlusion rim and mucosa was defined by lifting the occlusion rim 0.1 mm from the mucosal surface vertically in the Connected model. The new nodes were connected by gap elements and truss elements vertically. The new model with contact components was called the Separated model. (Figs. 2, 3)

Displacement of the occlusion rim, stress and strain on the mucosal surface, mucosa, and bone were

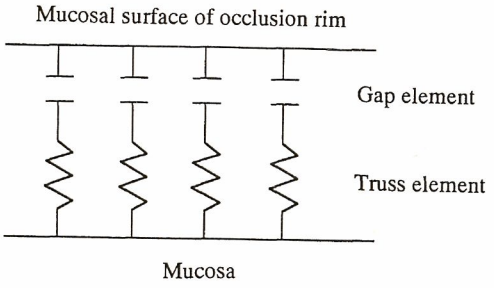

Fig. 3. Gap elements and Truss elements for constructing the occlusion rim-mucosa interface.

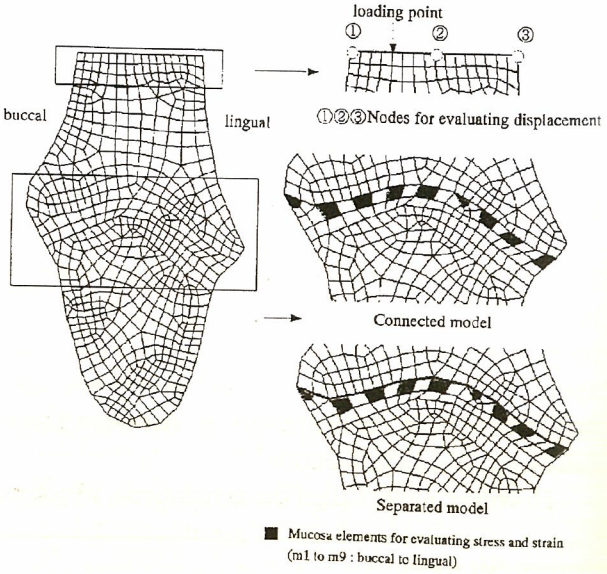

Fig. 4. Loading point and nodes on the occlusal surface and elements in the mucosa for evaluating stress and strain.