

18<sup>th</sup> International Conference on

# Oral Health & Maxillofacial Surgery

December 05-06, 2016 Madrid, Spain

## Skeletal and dentoalveolar effects of Twin-block appliances in the treatment of Class II malocclusion: finite element analysis

**Ritu Duggal**

CDER All India Institute of Medical Sciences, India

**Introduction:** The aim of the research project was to evaluate and analyze the stress and its areas, displacement and force generated in the human mandible, following Twin Block therapy through 3 dimensional finite element analysis.

**Methods:** A 3D finite element model of the mandible was constructed from the Ct Scan of a patient who had undergone twin block therapy and had achieved Class I molar relation or had completed at least six months of treatment. Mimics and Ansys software were used for 3D Model generation. In the 3D finite element model the magnitude and direction of the muscle force attached to the mandible were entered in all the three planes i.e. x,y,z respectively. The length in x plane was 105.44mm length in y plane was 75.823 mm and in the z plane was 94.364mm. The volume of the geometry was 46066 mm<sup>3</sup> and mass was 4.6112e+.006 kg

**Results:** The entire mandible was moved antero-inferiorly. The antero inferior displacement of the mandibular dentition was most pronounced in the incisor region. The entire dentition experienced tensile stress. Maximum tensile stress and von Mises stresses were occurred in the condylar neck and head. The force generated was 101.76 N.

**Conclusions:** The tensile stresses on the condyle were suggestive of biomechanical effects of the twin block appliance, role of condylar cartilage and lateral pterygoid muscle on the growth of the mandible after functional appliances. The displacement suggested that the entire mandible moved antero inferiorly and the force generated suggested that activating the muscle attached to the mandible could bring the changes in the direction of growth.

### Biography

Ritu Duggal is currently working as a Professor in Department of Orthodontics CDER, AIIMS. She has graduated from Government Dental College, Bombay (1986) and did her post graduation from All India Institute of Medical Sciences, New Delhi (1989) in field of orthodontics. She has special interest in Non Extraction treatment and Functional Jaw Orthopedics.

ritudug@gmail.com

### Notes: