ABSTRACT

INTRODUCTION: Class III malocclusion can be due to maxillary deficiency, mandibular prognathism or combination of both. These malocclusions can be treated only surgically after the cessation of growth period. But during the growth phase, growth modifications can be achieved with orthopaedic appliance. Maxillary deficiency patients are treated with face mask therapy. The movement of maxilla in forward direction and backward rotation of mandible are elicited as the main effects of the conventional face mask therapy. In addition to the necessary movement, various side effects such as labioversion of maxillary incisors, extrusion of maxillary molars, counterclockwise rotation of maxillary plane and clockwise rotation of mandible also occurs. So this study assess the movement of maxilla by directly placing an implant without the side effects produced by the intra oral splint used in conventional face mask therapy.

AIMS AND OBJECTIVES: To assess the Von Misses stress at different conditions, at circum maxillary sutures and on mini implants with 350 grams and 500 grams of force with implants placed anteriorly and posteriorly with 10°, 20° and 30° force vector below occlusal plane. To assess the displacement at x,y and z axis with 350 grams and 500 grams of force with10°, 20° and 30° force vector below occlusal plane with implants placed anteriorly and posteriorly.

MATERIALS AND METHODS: Mini implant was modified with the ball attachment on either side of the head to place elastics. 3D Finite Element model of cranium along with maxilla was constructed from 11 year old patient.

RESULTS: Stress and displacement were tabulated and analysed using ANSYS software.
CONCLUSION: The results suggested that it was more advantageous when the implants were placed on the anterior region rather than on the posterior region. The analysed stress pattern and the displacement of maxilla showed more favourable results with the anterior implant when compared to posterior implant.

The optimum force would be 500 grams as it showed reasonable displacement and relevant stress pattern as compared with the 350 grams on both anterior and posterior positioned implants. As far as the force vector was concerned, 100 vectors were favourable according to this study. The stress and displacement was more in 100 force vector compared to 200 and 300 vector in this study.

KEYWORDS: Mini implants, FEM, Class III malocclusion, ball headed mini implant, retrognathic maxilla.