

A numerical investigation to achieve optimum intrusion of a maxillary central incisor in lingual orthodonticsAbhishek M Thote¹, Rashmi V Uddanwadiker¹, Krishna Sharma², Sunita Shrivastava² and Gangadhar Navnage¹¹Visvesvaraya National Institute of Technology, India²Sharad Pawar Dental College, India

The objective of the present study was to devise an optimum force system by specifying toe (Θ) for an intrusive force to achieve intrusion of a maxillary central incisor in lingual orthodontics. The geometrical model of a maxillary central incisor with normal inclination was developed. The total six different positions of the bracket slot were considered according to three different heights (h) from the incisal edge as 3 mm, 4 mm, 5 mm and two different horizontal distances (x) from incisor surface as 2 mm and 3 mm. The finite element analysis was performed to verify the calculated values of Θ for all the aforesaid six positions of the bracket slot. In

finite element analysis, the results were shown in the form of vectors of nodal displacements along with undeformed and deformed models. The desired intrusion of a maxillary central incisor was observed. Thus, the devised force system from a geometrical model was verified with finite element analysis. For x=2 mm and 3 mm, no toe was required at heights h=4 mm and 3 mm, respectively. Thus, the almost pure intrusion can be achieved at these positions of bracket slot. Hence, these two positions can be considered as better positions of bracket slot.

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