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论著

减阻-牵张快速牙移动相关影响因素及有效性探索

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摘要： 目的: 建立Beagle犬减阻牵张快速牙移动动物模型，探索减阻、牵张措施在快速牙移动中的作用及其可靠性。方法: Beagle犬20只，随机在下颌左右两侧分别实施不同术式：减阻-牵张加力频率2次/d，减阻-牵张加力频率6次/d，减阻-常规加力，常规加力。每种术式各10个单侧。分别于加力前、加力15 、保持30 d时行牙髓活力、牙齿松动度、牙齿移动距离测量，锥形束CT观察评估牙齿倾斜度、牙根吸收和牙槽骨质密度变化。结果: 减阻-牵张2，6次/d频率下牙齿移动距离相似(P>0.05)，都明显快于减阻-常规加力组，常规加力组移动速度最慢; 减阻-牵张下移动牙加力前后牙髓活力正常，未见牙根广泛性吸收和骨质缺损等副作用; 减阻-牵张组移动牙发生远中倾斜程度(13.9°±3.5°)略大于常规方法(6.6°±1.3°)(P<0.05)。结论: 减阻、牵张是实现牙齿快速移动的关键因素，二者缺一不可; 减阻-牵张技术能够在可接受牙齿倾斜限度内实现牙快速移动而不伴明显的副作用。

关键词： 牵张成骨 快速牙移动 支抗 牙槽骨密度

Related factors and effectiveness of rapid teeth movement through reducing resistance and distraction

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Abstract: Objective: To investigate the role of reducing resistance and distraction in rapid teeth movement and its reliability by establishing the Beagle dogs’ experimental model.
Methods: The left or right sides in mandibles of 20 beagles were randomly operated with different treatments: distraction twice a day through reducing resistance; distraction 6 times a day through reducing resistance; conventional distraction through reducing resistance; and conventional distraction (the control group). Each treatment was carried out in 10 sides. The pulp vitality, tooth mobility and distance of teeth transportation were evaluated at different time points: before the distraction, distraction after 15 days, retaining 30 days after 15 days of distraction. The degree of inclination, root resorption and alveolar bone density of the compressive areas were evaluated by cone-beam computed tomography images.
Results: The distance of teeth transportation was similar in groups distraction twice daily and 6 times a day through reducing resistance (P>0.05), but their speed of transportation was significantly higher than that of conventional distraction through reducing resistance. The conventional distraction group had the lowest speed of transportation. The pulp vitality of distracted teeth was normal, and no root comprehensive resorption and periodontal defect were found. Distracted teeth in the reduced resistance and distraction groups (13.9°±3.5°) tipped more that in the conventional distraction group (6.6°±1.3°) (P<0.05).
Conclusion: Reducing resistance and distraction are inseparable factors to realize fast teeth moving. The rate of orthodontic tooth movement can be accelerated through resistance reduction and periodontal distraction without obvious unfavorable effects but at minimal acceptable teeth inclination.

Keywords: distraction osteogenesis rapid tooth movement anchorage dental alveolar bone density

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