

正畸矫治对上颌外伤切牙牙髓活力的影响

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摘要 目的:研究正畸矫治对上颌外伤切牙牙髓活力的影响。方法:选取我院正畸科 2006~2011 年期间的病例 60 例,并按上颌切牙有无外伤史分为正畸外伤组和正畸无外伤组两组;选取我院牙体牙髓科 2008-2011 年期间上颌切牙有外伤但未行 RCT(Root canal treatment)的病例 30 例,设为外伤无正畸组。对三组间上颌切牙所患牙髓坏死的机率进行比较。结果:正畸外伤组与正畸无外伤组有显著性差别($P<0.01$),正畸外伤组与外伤无正畸组亦有显著性差别($P<0.05$)。而正畸无外伤组与外伤无正畸组没有显著性差别($P>0.05$)。结论:正畸治疗患者中,有严重牙周损伤史的上颌切牙患牙髓坏死的机率要明显高于无外伤史的上颌切牙。

关键词 正畸治疗;上颌切牙;外伤史;牙髓活力

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Impact of Orthodontic Treatment on Pulpal Vitality of Traumatic Maxillary Incisors

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ABSTRACT Objective: To detect the impact of orthodontic treatment on pulpal vitality of traumatic maxillary incisors. **Methods:** The cases were collected from Department of orthodontics and Department of dental pulp, Stomatological College, Fourth Military Medical University during the period 2006 to 2011, and were divided into three groups: orthodontic traumatic group, orthodontic no-traumatic group and trauma group. The pulpal necrosis probabilities of the three groups were compared with each other, respectively. **Results:** There was significant difference between the orthodontic traumatic group and the orthodontic no-traumatic group ($P<0.01$), which was more distinguished than the difference between the orthodontic traumatic group and the trauma group ($P<0.059$). No significant difference was observed between the orthodontic no-traumatic group and trauma group ($P>0.05$). **Conclusion:** Orthodontic treatment of patients, with severe periodontal injury history of maxillary incisors have more chances to take pulp necrosis than those without trauma.

Key words: Orthodontic treatment; Maxillary incisors; Trauma history; Pulp necrosis.

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前言

以往研究表明,在接受正畸治疗的患者中,上颌切牙有过外伤史的占相当高的比例^[1-4]。因此,在常规的正畸治疗中,有过外伤史的切牙的移动已越来越被广大的正畸医师所关注。许多学者对正畸治疗后外伤牙齿的牙根吸收做了研究^[5-8]。然而,正畸治疗对外伤上颌切牙牙髓活力影响的报道较少,本课题对此展开研究。

1 资料与方法

1.1 临床资料

选自我院正畸科 2006~2011 年期间的病例,根据病例记载,选取 30 例上颌切牙有外伤的正畸患者,其中男 18 例,女 12 例,共计 47 颗外伤上颌切牙,随机选取 30 例上颌切牙无外

伤史的正畸患者,其中男 20 例,女 10 例,共计 120 颗无外伤史的上颌切牙;选取我院牙体牙髓科 2006-2008 年期间的病例,根据病例记载,选取 30 例上颌切牙外伤但未行 RCT(Root canal treatment)治疗的患者,其中男 16 例,女 14 例,共计 42 颗外伤上颌切牙。并确定受试对象的纳入标准:①所选病例样本均有完整的病例记载;②所选正畸患者样本前牙均有一定程度的外伤史;③正畸均采用常规固定直丝矫治方法;④所选正畸治疗患者均为治疗结束后且牙齿稳定者。

1.2 方法

将实验分为三组,第一组为上颌切牙有外伤史的正畸患者;第二组为上颌切牙无外伤史的正畸患者;第三组为上颌切牙有外伤史但未行正畸治疗的患者。正畸治疗结束后,分别对正畸外伤组以及正畸组上颌切牙进行牙髓活力测试。外伤无正畸组上颌切牙牙髓活力测试均为外伤后 3 年以上。并对 3 组上颌切牙所患牙髓坏死的几率进行比较,得出其差异性。

按牙齿外伤程度分为轻度(损伤牙釉质或牙本质,但无牙髓症状)、中度(损伤牙本质,有轻微牙髓症状,及时牙体治疗)、重度(牙周损伤、牙齿松动 II 度以上)。各组所选牙齿情况见表 1。

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表 1 各实验组所选牙齿数目及外伤等级分类

Table 1 The numbers of teeth in different groups and the classes of trauma

Classes of traumatic	Orthodontic traumatic group	Orthodontic no-traumatic group	Trauma group
Light	23	-	25
Middle severe	16	-	12
Severe	8	-	5
Total number	47	120	42

1.3 牙髓活力的评估

正畸外伤组以及正畸组样本牙髓活力测试均在正畸治疗结束 6 个月以上,外伤无正畸组样本牙髓活力测试均在外伤 3 年以上。牙髓活力评估的方法:①观察牙齿颜色,②拍摄根尖片及全口曲面断层片;③利用牙髓活力测试仪。评定牙髓坏死的标准:①牙齿颜色改变,②根尖区出现低密度影响,③牙髓活力测试无反应。除符合第③项标准外,出现另外两项任一症状,均可视为牙髓坏死^[9-12]。

1.4 统计学处理

采用 χ^2 检验统计方法对不同实验组进行比对,并对相同等级的不同实验组进行比对,得出其相关性。采用 Spss13.0 统计分析软件。

2 结果

在正畸外伤组患者中检测出 5 颗牙齿牙髓坏死,约占受测牙齿的 8.5%,正畸组无外伤组和外伤无正畸组均有 2 例牙髓坏死,分别占该组受测牙齿的 1.6%和 4.8%。正畸外伤组与正畸无外伤组有显著性差别($P<0.01$),正畸外伤组与外伤无正畸组亦有显著性差别($P<0.05$),而正畸无外伤组与外伤无正畸组没有显著性差别($P>0.05$)。

正畸外伤组重度损伤的切牙牙髓坏死的几率明显高于正畸无外伤组($P<0.01$)和外伤无正畸组($P<0.05$),正畸外伤组轻度、中度外伤切牙的牙髓坏死率与其余两组间无明显差异。

3 讨论

随着社会的进步以及人们生活水平的提高,采取正畸手段来治疗牙齿不齐、牙列拥挤等错颌畸形已经成为一种普遍现象。而在接受正畸治疗的患者中,上颌切牙受过外伤的亦占不小的比例,正畸过程中,受正畸力的作用,外伤切牙进行小范围的移动,从而引起一些牙齿隐裂、牙髓炎、牙髓坏死等疾病的发生。为临床正畸医师提出了难题,也在正畸操作中越来越强调规范、合理,以及考虑正畸过程中牙齿的生物环境耐受性。

实验表明,正畸治疗患者中,有严重牙周损伤史的上颌切牙患牙髓坏死的几率要明显高于无外伤史的上颌切牙以及虽有外伤史但未接受过正畸治疗的上颌切牙。

许多研究显示,正畸过程中牙齿的移动可以影响牙髓血液的流动^[13-17]。而在影响牙髓血液流动的因素中,压低牙齿的正畸力对根尖区的压力被认为是最重要的因素之一^[18-20]。在牵引前磨牙建合过程中,同样使得牙髓的血液流动受到影响^[21-22]。未受过外伤的牙齿的牙髓可以适应正畸力带来的这种影响,但牙周受过损伤的牙齿,在接受正畸治疗的过程中无法完成自我调整

来适应周围环境的改变,因而更容易出现牙髓坏死的症状。

对于上前牙外伤未接受正畸治疗的患者,在外伤后及时进行治疗而保留牙髓的,经过 3 年的观察期,极少出现牙髓坏死的症状。这与其在观察期间有一个稳定的生物环境有着密切的关系。外伤的上颌切牙牙髓血液流动通畅,血液供应充沛,加之没有正畸力的影响,从而减少了牙髓坏死的几率。

有外伤史及牙周受过损伤的上颌切牙,在正畸治疗过程中发生牙髓坏死的几率要明显高于未受过外伤的上颌切牙。因此,在正畸治疗的过程中,要认真询问患者,有无上颌切牙外伤史。在治疗有外伤史的患者时,我们最好使用轻力,并密切观察牙髓的反应情况,定期进行牙髓活力测试。尤其是在需要内收上前牙的患者中,应避免上前牙过度内收而导致的上前牙牙根暴露或牙髓血液供应障碍,密切关注上颌切牙的牙冠颜色有无改变,牙髓活力有无减弱。在矫治结束后,有必要对外伤的上切牙进行牙髓活力检查及记录,并叮嘱患者定期复查。

参 考 文 献(References)

[1] Bauss O, R ling J, Rahman A, et al. The effect of pulp obliteration on pulpal vitality of orthodontically intruded traumatized teeth [J]. J Endod, 2008,34:417-420

[2] Al-Khateeb S, Al-Nimri K, Alhaija EA. Factors affecting coronal fracture of anterior teeth in North Jordanian children[J]. Dent Traumatol, 2005,21:26-28

[3] Witherspoon D E. Vital pulp therapy with new materials: new directions and treatment perspectives permanent teeth [J]. Pediatr Dent, 2008, 30(3): 220-224

[4] Bauss O, Ro hling J, Schwestka-Polly R. Prevalence of traumatic injuries to the permanent incisors in candidates for orthodontic treatment[J]. Dent-Traumatol, 2004,20:61-66

[5] Bauss O, Freitag S, Ro hling J, et al. Influence of overjet and lip coverage on the prevalence and severity of incisor trauma [J]. Orofac Orthop, 2008,69:402-410

[6] Hartsfield J.Genetic factors in external apical root resorption and orthodontic treatment[J]. Crit Rev Oral Biol Med, 2004,15(2):115-122

[7] Jarvinen S. Traumatic injuries to upper permanent incisors related to age and incisal overjet: a retrospective study [J]. Acta Odontol Scand, 1979, 37:335-338

[8] Nigul K, Jagomagi T. Factors related to apical root resorption of maxillary incisors in orthodontic patients stomatologija [J]. Baltic Dent Maxillofac J, 2006, 8(3):76-79

[9] Imamura N, Nakata S, Nakasima A. Changes in periodontal pulsation in relation to increasing loads on rat molars and to blood pressure[J]. Arch Oral Biol, 2002, 47(8):599-606

- [10] Kitasako Y, Ikeda M, Tagami J. Pulpal responses to bacterial contamination following dentin bridging beneath hard-setting calcium hydroxide and self-etching adhesive resin system [J]. *Den Traumatol*, 2008, 24(2):201-206
- [11] Linge BO, Linge L. Apical root resorption in upper anterior teeth[J]. *Eur J Orthod*, 1983,5:173-183
- [12] Imazato S. Bio-active restorative materials with antibacterial effects: new dimension of innovation in restorative dentistry[J]. *Dent Mater J*, 2009, 28(1):11-19
- [13] Rönnerman A. Orthodontic movement of traumatised upper central incisors: report of two cases[J]. *Swed Dent*, 1973,66:527-534
- [14] Bauss O, Röhling J, Sadat-Khonsari R, et al. Influence of orthodontic intrusion on pulpal vitality of previously traumatized maxillary permanent incisors[J]. *Orthod Dentofacial Orthop*, 2008,134:12-17
- [15] Vandevska-Radunovic V, Kristiansen AB. Changes in blood circulation in teeth and supporting tissues incident to experimental tooth movement[J]. *Eur J Orthod*, 1994,16:361-369
- [16] McDonald F, Pitt Ford TR. Blood flow changes in permanent maxillary canines during retraction[J]. *Eur J Orthod*, 1994,16:1-9
- [17] Derringer KA, Jagers DC, Linden RWA. Angiogenesis in human dental pulp following orthodontic tooth movement [J]. *Dent Res*, 1996,75:1761-1766
- [18] Dellinger EL. A histologic and cephalometric investigation of premolar intrusion in the *Macaca speciosa* monkey [J]. *Am J Orthod*, 1967,53:325-355
- [19] Caviedes-Bucheli J, Lombana N, Azuem-Holgutn MM, et al. Quantification of neuropeptides expressed in healthy and inflamed human dental pulp[J]. *Endod J*, 2006, 39(5):394-400
- [20] Reitan K. Clinical and histological observations on tooth movement during and after orthodontic treatment [J]. *Am J Orthod*, 1967,53:721-745
- [21] Barwick PJ, Ramsay DS. Effect of brief intrusive force on human pulpal blood flow [J]. *Am J Orthod Dentofacial Orthop*, 1996,110:273-279
- [22] Mostafa YA, Iskander KG, El-Mangoury NH. Iatrogenic pulpal reactions to orthodontic extrusion [J]. *Am J Orthod Dentofacial Orthop*, 1991,99:30-34

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- [6] 包崇云, 张兴栋. 磷酸钙生物材料固有骨诱导性的研究现状与展望 [J]. *生物医学工程学杂志*, 2006,23(2):442-445
- Bao Chong-yun, Zhang Xing-dong. Research Development and Prospect of Calcium Phosphate Biomaterials with Intrinsic Osteoinductivity[J]. *Journal of Biomedical Engineering*, 2006, 23(2):442-445
- [7] Merten HA, Wiltfang J, Grohmann U, et al. Intraindividual comparative animal study of alpha- and beta-tricalcium phosphate degradation in conjunction with simultaneous insertion of dental implants [J]. *J Craniofac Surg*, 2001, 12(1): 59-68
- [8] Kondo N, Ogose A, Tokunaga K, et al. Osteoinduction with highly purified beta-tricalcium phosphate in dog dorsal muscles and the proliferation of osteoclasts before heterotopic bone formation [J]. *Biomaterials*, 2006, 27(25):4419-4427
- [9] 张聪, 姚一民, 冯怀志, 等. 多孔生物活性陶瓷治疗骨缺损(附 40 例临床应用报告) [J]. *西南国防医药*, 2003,13(3):274-276
- Zhang Cong, Yao Yi-min, Feng Huai-zhi, et al. The effect of porous active bioceramic on bone defect: report of 40 cases [J]. *Medical Journal of National Defending Forces in Southwest China*, 2003,13(3): 274-276