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微型种植体支抗在口腔正畸治疗中的临床研究

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摘要 目的:探讨微型种植体支抗在口腔正畸治疗中的效果。**方法:**将 80 例需口腔正畸治疗的患者随机分为两组,对照组给予传统正畸治疗,观察组给予微型种植体支抗治疗,观察和比较两组的手术成功率、治疗结果及随访 2 周期间不良反应的发生情况。**结果:**观察组手术成功率(92.5%)显著高于对照组(70.0%, $P<0.05$)。治疗后,观察组上中切牙凸距差为 (4.54 ± 1.21) mm (增加 80.9%)、上中切牙倾角为 (27.27 ± 4.45) mm(增加 132.3%)、下齿槽座角为 (1.49 ± 0.53) mm(增加 81.7%)、尖牙间宽度为 (1.73 ± 0.69) mm(增加 143.7%)、磨牙移位为 (3.25 ± 0.73) mm(降低 37.1%)、上齿槽座角为 (-1.81 ± 0.46) mm(降低 147.9%),与对照组相比,均有显著性差异($P<0.05$)。随访 2 周内,与对照组相比,观察组口腔炎症、口腔感染、不适感降低以及软组织轻度浮肿等不良反应的发生率(10%)显著低于对照组(30%, $P<0.05$)。**结论:**微型种植体支抗在口腔正畸治疗中能发挥理想的矫治效果,稳定性好,手术成功率和安全性均较高。

关键词:微型种植体;支抗;口腔正畸;矫治效果

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Clinical Investigation of Micro-implant Anchorage in the Treatment of Orthodontics

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ABSTRACT Objective: To investigate the efficacy of micro-implant anchorage in the treatment of orthodontics. **Methods:** 80 cases of patients with orthodontics in our hospital were chosen and randomly divided into two groups, the control group was given traditional orthodontics, the observation group was given micro-implant anchorage. The operation success rate, therapeutic outcomes and incidence of adverse reactions followed up for 2 weeks were observed and compared between two groups. **Results:** The achievement ratio of operation in observation group (92.5%) was higher than that of the control group (70.0%, $P<0.05$). After treatment, the upper middle incisors difference was (4.54 ± 1.21) mm in the observation group (an increase of 80.9 percent), the inclined angle of upper middle incisors was (27.27 ± 4.45) mm (an increase of 132.3 percent), the groove angle of lower tooth was (1.49 ± 0.53) mm (an increase of 81.7 percent), the intercanine width was (1.73 ± 0.69) mm (an increase of 143.7 percent), the molar shift was (3.25 ± 0.73) mm (a reduction of 37.1 percent), the groove angle of upper tooth was (-1.81 ± 0.46) mm (a reduction of 147.9 percent), which all showed significantly difference compared with the control group ($P<0.05$). Compared with the control group, the incidence of adverse reactions including oral inflammation, oral infection, discomfort, the mildly swollen of soft tissue in observation group was dramatically lower than that of the control group (30%, $P<0.05$). **Conclusion:** Micro-implant anchorage had corrective action, good stability, high operation successful rate and safety in the treatment of orthodontics.

Key words: Micro-implant; Anchorage; Orthodontics; Disease management

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前言

由先天或后天因素引起的牙齿、颌骨、颌面间的关系不匀称称为错颌畸形,在我国发病率较高,积极预防与治疗错颌畸形

具有重要的临床意义^[1-3]。鉴于患者对外貌的关注度较高,一般采取正畸治疗方式恢复上下牙列不齐、上下牙弓牙合关系异常^[4,5]。近年来,微型种植体作为一种骨骼支抗装置在正畸治疗中非常受欢迎^[6,7],其很好地替代了口内支抗和口外弓装置等传统正畸支抗系统。传统矫治方式不但影响患者外观,并且矫治装置在远期随访当中出现稳定性下滑,导致矫治效果下降^[8,9]。微型种植体不仅具有相对较小的尺寸,还有用户友好协议、即时

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负载潜力、生物力学的适应性、高成功率、低成本等优点,最重要的是患者可接受^[10,11]。虽然微型种植体失败的案例很少,但在临床上确实出现了一期愈合后微型种植体剥离的案例,似乎与大量咬合压力和生物材料集中感染有关。目前,虽然患者已经广泛关注口腔卫生以及使用抗微生物漱口水,但这种感染仍然发生。如何降低术后口腔感染并较好地减少支抗部分移动是临床需要克服的主要障碍^[12,13]。因此,本研究主要探讨了微型种植支抗在口腔正畸中的应用效果以及术后不良反应的发生情况。

1 资料与方法

1.1 一般资料

选取我院口腔科收治的 80 例患者,这些患者需接受正畸治疗。年限:2012 年 4 月-2015 年 12 月,纳入标准:(1)患者依从性较高,愿意接受正畸治疗;(2)口腔卫生良好;(3)本研究经过本院伦理委员会同意,且患者在术前签署书面知情同意书。排除标准:全身系统性疾病,牙龈炎,慢性牙周炎患者。80 例患者入院后,按随机数字表法分为对照组(n=40)和观察组(n=40)。对照组,男 29 例,女 11 例,年龄 33~57 岁,平均(45.72±12.78)岁;观察组男 26 例,女 14 例,年龄 31~62 岁,平均(46.75±15.83)岁。且两组患者在一般资料(包括:性别、年龄等)比较差异无统计学意义(P<0.05)。

1.2 治疗方法

通常在正畸治疗前,需要保持口腔清洁干净,故患者入院后使用 0.02%洗必泰漱口,清洁口腔残留物,口腔局部麻醉所用麻醉药物为利多卡因,所有正畸病例均采用直丝弓矫治技术,对牙弓不齐、不平整状态进行矫治。观察组患者术前常规拍摄曲面断层片、根尖片,检查牙根的形态和位置及相邻的组织,

选择合适型号的微型种植体植入,可灵活植入两邻牙牙根之间的牙槽嵴,植入时注意保护牙周组织内牙窦、牙槽神经等。术后拍摄全景片、侧位片、根尖片,观察其植入情况。术后口服抗生素预防感染,每个月复诊 1 次。微型种植体取出时,无需麻醉,取出后也不用对创口进行特殊处理,可自行痊愈。对照组采取传统正畸方法进行治疗。

1.3 观察指标

(1)手术成功率,记录手术成功的人数,若术后能满足正常上下牙正常咬合关系,牙列整齐、美观,无牙龈疼痛和感染情况,则判定为手术成功;(2)X 射线观察两组患者上中切牙凸距差、尖牙间宽度,上中切牙倾角、上齿槽座角、下齿槽座角、磨牙移位;(3)不良反应,随访 2 周,观察并记录是否出现口腔炎症、口腔感染、不适感、软组织轻度浮肿等不良反应。

1.4 统计学分析

采用 SPSS 17.0 进行数据统计分析,计量资料数据以($\bar{x} \pm s$)表示,组间比较采用 t 检验,计数资料以【例(%)】表示,组间比较采用卡方检验,以 P<0.05 为差异有统计学意义。

2 结果

2.1 两组手术成功率的比较

观察组成功 37 例,手术成功率 92.5%;对照组成功 28 例,手术成功率 70.0%,观察组手术成功率显著高于对照组(P<0.05)。

2.2 两组治疗结果的比较

治疗后,观察组上中切牙凸距差、尖牙间宽度大于对照组(P<0.05),上中切牙倾角、上齿槽座角的绝对值,下齿槽座角均大于对照组(P<0.05),观察组磨牙移位小于对照组(P<0.05),见表 1。

表 1 两组治疗结果对比

Table 1 The comparison of therapeutic outcomes between observation group and control group

Items	Observation group	Control group
The upper middle incisors difference(mm)	4.54± 1.21*	2.51± 0.81
The inclined angle of upper middle incisors (°)	27.27± 4.45*	11.74± 2.47
The molar shift(mm)	3.25± 0.73*	5.17± 0.54
The groove angle of upper tooth(°)	-1.81± 0.46*	-0.73± 0.22*
The groove angle of lower tooth(°)	1.49± 0.53*	0.82± 0.36
The intercanine width(mm)	1.73± 0.69*	0.71± 0.18

Note: compared with the control group, *P<0.05.

2.3 两组不良反应发生情况的比较

对照组(30%,P<0.05),见表 2。

随访 2 周内,观察组不良反应的发生率为 10%,显著低于

表 2 两组不良反应的发生情况对比

Table 2 The comparison of incidence of adverse reactions between observation group and control group

Groups	Oral inflammation	Oral infection	Discomfort	Mildly swollen of soft tissue	Rate of adverse reactions
Observation group (n=40)	1	0	2	1	4(10.0) *
Control group(n=40)	2	3	4	3	12(30.0)

Note: compared with the control group, *P<0.05.

3 讨论

正畸治疗是治疗牙周疾病常用的矫治方法,通过矫正装置对牙齿等持续施加压力,从而有效纠正错颌畸形或牙齿畸形,降低牙列不齐对面部的影响^[14,15]。在口腔正畸治疗中,支抗是极其关键的一部分,在被矫治牙移向目标位置的过程中,尽量减少支抗部分移动甚至不移动^[16],这就需要在正畸治疗过程中采取优良的支抗设计并控制支抗,以便取得较为理想的矫治结果^[17,18]。近年来,随着正畸治疗技术地不断发展,临床出现了一种新型种植体支抗,即微型种植体支抗技术^[19,20]。与传统常用的支抗控制方式不同,微型种植体支抗可将矫治力的反作用力施加于颌骨上^[21,22],避免了不必要的牙齿移动,可以达到较为满意的治疗效果^[23,24],尤其适用于那些具有不完全牙列的成年人以及在不遵守治疗的青少年尤其有用^[25]。

李雪琦的研究选取平均年龄 27~29 岁的青年男女进行微型种植体支抗口腔正畸手术,结果显示术后患者的不良反应总发生率为 43%。而进行非种植体支抗的患者术后不良反应总发生率为 76.66%^[26]。本研究选择年龄 45-47 岁的中年男女进行上述手术,术后患者的不良反应总发生率为 10%。而进行传统正畸治疗的患者术后不良反应发生率为 30%。一般如果接受正畸治疗的患者年龄层次偏低,那么他们可能无法具有较高的配合度^[27,28]。因此,不管是微型种植体支抗治疗还是传统种植体支抗治疗,患者的配合度对口腔正畸手术后炎症、感染、不适以及组织水肿等不良反应的发生率有显著影响。上述结果也表明微型种植体在口腔正畸治疗中的术后不良反应发生率低于传统种植体支抗治疗。由于微型种植体材质多为金属钛,固定方面依靠种植体与骨组织直接的机械嵌合力,不依赖于骨性结合固定,不会出现排斥反应,术后发生感染的概率较低^[29]。

观察组手术成功率为 92.5%,显著高于对照组为(70.0%),说明微型种植体支抗易于进行手术操作,这和其自身材质、支抗设计有较大关系。治疗后,观察组磨牙移位小于对照组,说明微型种植体在矫治过程能够保持稳定,达到了支抗部分减少位移或不位移的目的。这与刘洪等人的研究结果类似,他们选择平均年龄为 25 岁的青年男女接受微型种植体支抗正畸治疗,术后磨牙移位为 3.48 mm^[30],与本研究术后磨牙移位 3.25 mm 接近。因此,年龄差距对微型种植体支抗的手术治疗结果影响不大,但对术后不良反应的发生可能有极大的影响。刘洪等的研究显示在术后 2 年时,不良反应发生率为 8%,而本研究患者在术后 2 周时不良反应发生率已经为 10%。因此,年龄可能是影响微型种植体支抗术后恢复的因素之一。观察组治疗后上中切牙凸距差、尖牙间宽度大于对照组,说明微型种植体对牙列不齐,错颌畸形的矫治效果较好,治疗后更接近正常的覆牙合、覆盖。

综上所述,微型种植体支抗在口腔正畸治疗中能发挥理想的矫治效果,稳定性好,手术成功率和安全性均较高。

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