

[DOI] 10.12016/j.issn.2096-1456.2023.08.005

· 临床研究 ·

儿童正中多生牙拔除时机对恒牙萌出异常矫治时长的影响

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【摘要】 目的 探讨儿童正中多生牙拔除时机与恒牙萌出异常矫治时长的关系, 为临床治疗提供依据。**方法** 将187例儿童正中多生牙分为I型萌出型、II型冠部埋伏型、III型牙间埋伏型、IV型根部埋伏型。按拔除时机分别将I型、III型、IV型多生牙分为: 毗邻中切牙萌出前拔除组(A), 毗邻中切牙萌出后拔除组(B); 将II型多生牙分为: 对侧中切牙萌出前拔除组(A), 对侧中切牙萌出后拔除组(B)。统计正中多生牙所致的错殆畸形表现及多生牙拔除后恒前牙萌出异常的矫治时长。**结果** 正中多生牙引起后继恒前牙萌出异常表现为: 唇侧异位萌出106例, 恒牙阻萌28例, 牙扭转27例, 个别牙反殆26例。I型A组、II型A组、III型A组平均矫治时长分别为(7.07 ± 2.45)个月、(6.57 ± 1.12)个月、(6.95 ± 2.52)个月, 低于I型B组(9.67 ± 3.04)个月、II型B组(10.25 ± 1.29)个月、III型B组(9.33 ± 3.26)个月, 差异均具有统计学意义($P < 0.01$); IV型A组平均矫治时长(6.00 ± 0.94)个月, 与B组(6.33 ± 0.80)个月之间差异无统计学意义($P > 0.05$)。**结论** 儿童正中多生牙在邻近中切牙萌出前拔除, 在大多数情况下可减低后期恒前牙萌出异常的矫治时长。

【关键词】 正中多生牙; 错殆畸形; 拔牙时机; 萌出异常; 矫治时长; 早期矫治; 儿童

【中图分类号】 R78 **【文献标志码】** A **【文章编号】** 2096-1456(2023)08-0567-06

【引用著录格式】 郭小科, 刘建锋, 赵吉宏, 等. 儿童正中多生牙拔除时机对恒牙萌出异常矫治时长的影响[J]. 口腔疾病防治, 2023, 31(8): 567-572. doi:10.12016/j.issn.2096-1456.2023.08.005.

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【Abstract】 Objective To discuss the correlation between the extraction timing of mesiodens and the orthodontic treatment duration of its eruption-related complications in children to provide a reference for the clinic. **Methods** The mesiodentes of 187 children were classified as eruption type (type I), dental crown impacted type (type II), interdental impacted type (type III), and dental root impacted type (type IV). According to the timing of extraction, mesiodentes in type I, type III, and type IV were divided into Groups A: before the eruption of the adjacent central incisor and B: after the eruption of the adjacent central incisor. Mesiodentes in type II were divided into Group A: before the eruption of the contralateral central incisor and B: after the eruption of the contralateral central incisor. Eruption-related complications and orthodontic treatment durations caused by mesiodens were statistically analyzed. **Results** There were 106

【收稿日期】 2022-10-27; **【修回日期】** 2023-01-15

【基金项目】 国家自然科学基金项目(82001066)

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cases of displacement, 28 cases of failed eruption, 27 cases of tooth rotation, and 26 cases of individual cross-bite among the eruption-related complications caused by mesiodens. The mean orthodontic treatment cycle in Group A of type I (7.07 ± 2.45 month), Group A of type II (6.57 ± 1.12 month), and Group A of type III (6.95 ± 2.52 month) were lower than that in Group B of type I (9.67 ± 3.04 month), Group B of type II (10.25 ± 1.29 month), and Group B of type III (9.33 ± 3.26 month), and the differences were statistically significant ($P < 0.01$). Meanwhile, there was no significant difference in the mean orthodontic treatment duration between Groups A (6.00 ± 0.94 month) and B (6.33 ± 0.80 month) of type IV ($P > 0.05$). **Conclusion** In most cases, the mesiodens are removed before the eruption of the adjacent central incisor, which can reduce the duration of orthodontic treatment for eruption-related complications in children.

【Key words】 mesiodens; malocclusion; tooth extraction timing; abnormal tooth eruption; orthodontic treatment duration; early orthodontic treatment; children

J Prev Treat Stomatol Dis, 2023, 31(8): 567-572.

【Competing interests】 The authors declare no competing interests.

This study was supported by the grants from National Natural Science Foundation of China (No.82001066).

正中多生牙是位于上颌中切牙间的多生牙,是最常见的多生牙类型^[1]。约76.8%的正中多生牙会引起并发症^[2],包括恒牙延迟萌出、恒牙阻生、邻牙异位萌出、牙列拥挤、上颌中切牙间隙、邻牙牙根的吸收或发育异常、囊肿的形成等^[3],并造成相应的错殆畸形。对于不干扰正畸中牙移动或没有明显症状的多生牙,可考虑暂不拔除。对已经影响恒牙正常萌出,造成前牙区错殆畸形的多生牙是拔牙的适应证^[4-5],且临床上需要多学科联合协作来完成^[6-7]。在正中多生牙有明确拔除指征的前提下,早期诊断、选择合适时机拔除该类多生牙可减低相关并发症的发生^[1,8-10]。本研究对近年来本科室诊治的187例因正中多生牙导致恒前牙萌出异常的儿童进行分析,探讨正中多生牙的拔除时机与矫治时长的关系,为临床决策提供依据。

1 资料和方法

1.1 一般资料

选择2016年7月至2022年7月在武汉大学口腔医院二七门诊部因正中多生牙致恒前牙萌出异常就诊的患儿187例。纳入标准:①年龄小于10岁的替牙列期患儿,且多生牙已拔除;②上颌至少2个恒切牙萌出,且矫治方法为2×4固定矫治;③矫治范围仅限于切牙,不包含尖牙的矫治。排除标准:①影像资料虽然有正中多生牙,但并未造成前牙区萌出异常;②前牙区有萌出异常,且影像资料显示多生牙存在,但其萌出异常由非多生牙因素导致,如唇系带短缩、乳牙根尖炎症等;③恒前牙萌出异常由正中多生牙所致,但其治疗方法为非2×4固定矫治,如无托槽隐形矫治技术等。

1.2 分类方法

以远离恒牙切端为低,接近为高。以正中多生牙毗邻的恒中切牙为参考点,按正中多生牙的生长部位将其分为I型萌出型(多生牙从牙列曲线中萌出,不包括腭侧萌出)、II型冠部埋伏型(多生牙埋伏于恒中切牙的切端或腭侧牙冠部,其矢状最低点不超过恒牙的牙颈部)、III型牙间埋伏型(多生牙各个方向埋伏于两个恒中切牙间,横断面见多生牙位于两个恒中切牙近中邻面之间)、IV型根部埋伏型(多生牙埋伏于恒中切牙的腭侧,其矢状最低点超过恒牙的牙颈部),见图1。

1.3 分组及多学科治疗

按拔除时机分别将I型、III型、IV型正中多生牙分为:毗邻中切牙萌出前拔除组(A),毗邻中切牙萌出后拔除组(B);将II型多生牙分为:对侧中切牙萌出前拔除组(A),对侧中切牙萌出后拔除组(B)。所有病例均先外科拔除多生牙,待上颌至少2颗切牙萌出时再行2×4固定矫治(图2)。萌出受阻的切牙配合固定或基托矫治器牵引治疗(图3),拥挤病例先行螺旋扩弓后再行2×4固定治疗(图4)。统计正中多生牙所致的错殆畸形表现及多生牙拔除后恒前牙萌出异常的矫治时长。

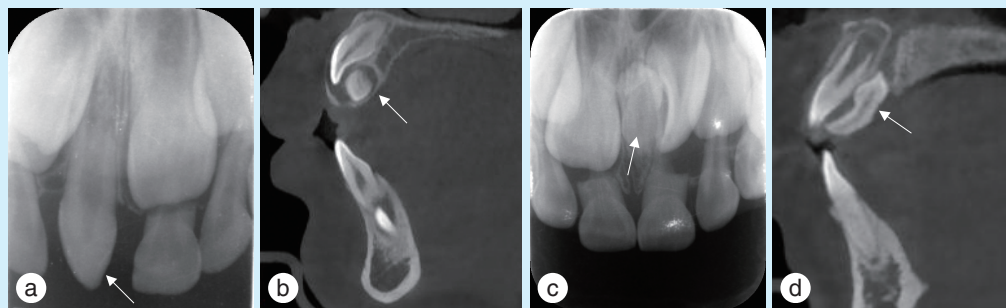
1.4 统计学分析

应用SPSS 25.0统计学软件进行数据分析,K-S检验显示数据符合正态分布,采用均数±标准差表示,两组间比较采用独立样本 t 检验。 $P < 0.05$ 为差异有统计学意义。

2 结果

2.1 患者基本信息

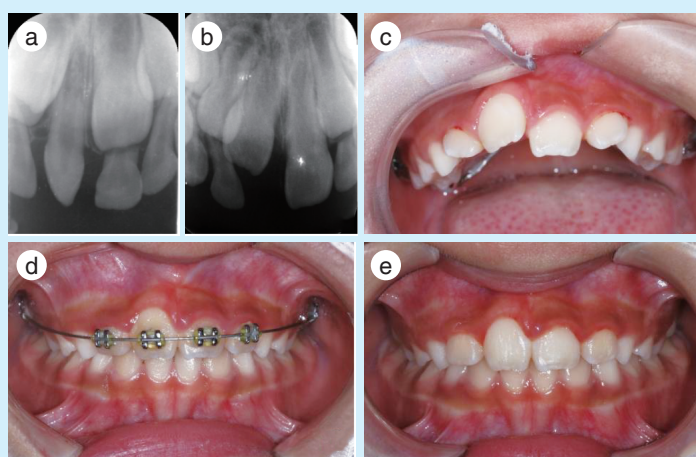
共纳入187例患者,拔除多生牙234颗。其中



a: mesiodens (arrow) erupting in the tooth arch (type I), and its roots can be erect or curved; b: mesiodens (arrow) is impacted on the palatal side of the crown of the permanent central incisor, and its lowest point does not exceed the neck of the permanent tooth with a sagittal orientation (type II). Its morphology is often tuberculate or odontoma, with or without a cyst; c: mesiodens (arrow) is impacted between the mesial surface of the permanent central incisors (type III), and it can be vertical, inverted, transverse or sagittal; d: mesiodens (arrow) is impacted on the palatal side of the permanent central incisor and it is mostly inverted (type IV). Its lowest point exceeds the neck of the permanent tooth with a sagittal orientation

Figure 1 Classification of mesiodens that cause abnormal anterior tooth eruption in children

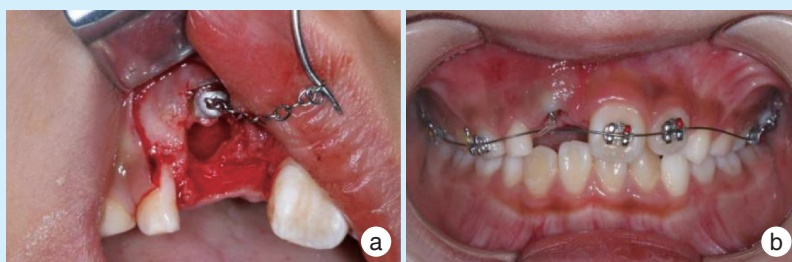
图1 引起儿童恒前牙萌出异常的正中多生牙分类



a: a supernumerary tooth was found in the deciduous dentition; b-c: a permanent central incisor was found to be ectopic 1 year later; d-e: a 2×4 technique was applied to correct the ectopic teeth

Figure 2 Typical case of abnormal eruption of anterior teeth caused by multiple teeth treated with a 2×4 appliance

图2 应用2×4矫治器治疗因多生牙致前牙异常萌出典型病例



a: a lingual button with a chain was attached to the impacted central incisor; b: combined orthodontic traction and 2×4 technique for the impacted central incisor

Figure 3 Combination orthodontic traction and 2×4 technique for the impacted central incisor

图3 应用2×4矫治技术联合牵引治疗恒中切牙萌出受阻

男136例,女51例;平均正畸矫治年龄为7.86岁;最小年龄6岁,最大年龄10岁。I型A组纳入30例,B组纳入30例;II型A组纳入21例,B组纳入28例;III型A组纳入22例,B组纳入27例;IV型A组纳入17例,B组纳入12例。

2.2 正中多生牙的形态学统计

正中多生牙按形态学统计为:锥形125颗、补充牙形64颗、结节状或瘤状45颗。

2.3 正中多生牙所致的错颌畸形表现

正中多生牙引起后继恒前牙萌出异常表现



为：唇侧异位萌出106例，恒牙阻萌28例，牙扭转27例，个别牙反骀26例（表1）。具体为①I型A组：唇侧异位萌出22例、牙扭转8例，可伴牙间隙；B组：侧切牙反骀13例、牙扭转8例、唇侧异位萌出9例，可伴牙间隙。②II型A组：唇侧异位萌

出21例；B组：中切牙阻生28例。③III型A组：唇侧异位萌出17例、牙扭转5例，可伴牙间隙；B组：侧切牙反骀11例、唇侧异位萌出10例、牙扭转6例，可伴牙间隙。④IV型A组：唇侧异位萌出17例；B组：唇侧异位萌出10例、中切牙反骀2例。

表1 正中多生牙所致的恒前牙萌出异常表现、正畸治疗方法及治疗时长

Table 1 Eruption-related complications, treatment methods and mean treatment cycle caused by mesiodentes

Group	Eruption-related complications	Treatment methods	Mean treatment cycle
Group A of type I	Displacement (22 cases)	2×4 corrective technique	5.73 months
	Rotation (8 cases)	2×4 corrective technique	10.75 months
Group B of type I	Lateral incisor cross-bite (13 cases)	Combined arch expansion and 2×4 technique	12.15 months
	Rotation (8 cases)	2×4 corrective technique	10.37 months
	Displacement (9 cases)	2×4 corrective technique	5.44 months
Group A of type II	Displacement (21 cases)	2×4 corrective technique	6.57 months
Group B of type II	Failure of eruption (28 cases)	Combined orthodontic traction and 2×4 technique	10.25 months
Group A of type III	Displacement (17 cases)	2×4 corrective technique	5.94 months
	Rotation (5 cases)	2×4 corrective technique	11.6 months
Group B of type III	Lateral incisor cross-bite (11 cases)	Combined arch expansion and 2×4 technique	12.18 months
	Rotation (6 cases)	2×4 corrective technique	10.67 months
	Displacement (10 cases)	2×4 corrective technique	5.6 months
Group A of type IV	Displacement (17 cases)	2×4 corrective technique	6 months
Group B of type IV	Displacement (10 cases)	2×4 corrective technique	5.9 months
	Incisor cross-bite (2 cases)	2×4 corrective technique	8.5 months

2.4 正中多生牙的拔牙时机与错骀畸形治疗时长的关系

①I型：A组平均矫治时长为(7.07 ± 2.45)个月；B组平均矫治时长为(9.67 ± 3.04)个月，差异有统计学意义($t = -4.531, P < 0.01$)。②II型：A组平均矫治时长为(6.57 ± 1.12)个月；B组平均矫治时长为(10.25 ± 1.29)个月，差异有统计学意义($t = -4.398, P < 0.01$)。③III型：A组平均矫治时长为(6.95 ± 2.52)个月；B组平均矫治时长为(9.33 ± 3.26)个月，差异有统计学意义($t = -3.490, P < 0.01$)。④IV型：A组平均矫治时长为(6.00 ± 0.94)个月；B组平均矫治时长为(6.33 ± 0.80)个

月，差异无统计学意义($t = -1.779, P > 0.05$)。见表2。

表2 正中多生牙的拔牙时机与矫治时长

Table 2 Extraction timing of mesiodentes and treatment duration

Group	n	Treatment cycle/month	t	P
Group A of type I	30	7.07 ± 2.45	-4.531	< 0.01
Group B of type I	30	9.67 ± 3.04		
Group A of type II	21	6.57 ± 1.12	-4.398	< 0.01
Group B of type II	28	10.25 ± 1.29		
Group A of type III	22	6.95 ± 2.52	-3.490	< 0.01
Group B of type III	27	9.33 ± 3.26		
Group A of type IV	17	6.00 ± 0.94	-1.779	> 0.05
Group B of type IV	12	6.33 ± 0.80		

3 讨论

正中多生牙的病因尚不明确,可能与遗传或环境因素有关^[11-12]。关于有明确拔除指征的正中多生牙的拔除时机,以往主要有两种观点:及早拔除和晚期拔除。及早拔除指在6岁中切牙萌出前发现多生牙即拔出,该时间段拔除的优点有:①可增加中切牙向牙弓正常位置萌出的可能性;②可避免或减少后期的正畸治疗;③上颌前部骨量丧失较少。因此,Shih等^[1]认为在5岁以前或毗邻切牙 nolla7期以前拔除能较大程度减少并发症的发生以及正畸治疗的可能性。然而,缺点在于术中有损伤恒牙牙根或牙胚的风险。晚期拔除指8~10岁毗邻中切牙的根尖孔已闭合时拔出,此时虽然可以避免牙根损伤,但也增加了后期正畸矫治的概率^[13]。随着锥形束CT^[14]、舒适化诊疗^[15]、个性化导板在多生牙诊疗的应用^[16],不仅可以较大程度避免手术中损伤毗邻恒牙牙根或牙胚的风险,同时也降低了患儿对手术的耐受要求。Koyama等^[17]将混合现实技术应用于正中多生牙的拔除,并认为混合现实技术可以避免因视线盲区而损伤恒牙牙根或牙胚的风险。Kim等^[13]发现正中多生牙与恒前牙发育迟缓有直接关系,而后者会增加前牙萌出异常的发生。Barham等^[18]认为正中多生牙拔除并未引起毗邻恒牙牙根的发育异常。因此,本研究将正中多生牙的拔除时机以毗邻或对侧中切牙萌出为界点来分组,探讨正中多生牙所致恒前牙萌出异常的矫治时长和拔牙时机的关系。

本研究将纳入病例分为I型萌出型、II型冠部埋伏型、III型牙间埋伏型、IV型根部埋伏型。从多生牙形态来看,I型的形态与以往分类中的补充牙型相同,II型与结节型相同,IV型与锥形相同。锥形最常见,多引起恒牙异位萌出,也可无症状;其次为补充型,在乳牙列较为常见;结节型最少,多阻碍切牙萌出^[19],这与本研究结果中I、II、IV型所致的恒前牙萌出异常表现一致。从多生牙的生长方向来看,I型的方向同以往分类中的正位型相同,III型可以垂直、倒置、横向和矢状生长,IV型多为倒置状。其中正位型最常见且多能自行萌出,倒置其次、横向最少^[20],这与本研究结果中I、III、IV型的多生牙生长方向分布一致。

正中多生牙引起的前牙区错殆畸形的表现有恒牙阻萌、牙间隙增大、牙扭转、个别牙反殆、唇侧异位萌出等^[21]。本研究正中多生牙引起恒前牙萌

出异常由高到低的排序为:唇侧异位萌出、恒牙阻萌、牙扭转、个别牙反殆。唇侧异位萌出在I型A组、B组,II型A组,III型A组、B组,IV型A组、B组均可能出现,治疗时长为6个月左右。牙扭转出现在I型A组、B组,III型A组、B组,其时长为10~11个月。恒牙阻萌仅出现II型B组,治疗时长为10个月左右。个别牙反殆出现在I型B组,III型B组,IV型B组。其中侧切牙反殆的治疗时长为12个月左右,中切牙反殆的治疗时长为8个月左右。导致这种差异是因为中切牙反殆较少涉及到间隙改变,不需要额外增加创造间隙的治疗时间。I型A组与B组错殆畸形表现差异在于侧切牙反殆,侧切牙反殆是因萌出的多生牙挤占了前牙区恒牙正常萌出空间所致,迫使侧切牙自腭侧萌出继而产生反殆。侧切牙反殆的矫治时长使得I型A组与B组的平均矫治时长出现了明显差异。II型A组与B组错殆畸形表现差异在于毗邻中切牙萌出受阻。对侧中切牙萌出前即发现冠部埋伏多生牙且及时拔除,待恒牙萌出时均表现为唇侧异位萌出,避免了对萌出受阻的中切牙行牵引治疗,从而缩短矫治周期。III型A组与B组错殆畸形表现差异同I型一致,也在于侧切牙反殆。这是因为III型和I型正中多生牙的阻生位置是相似的,区别在于多生牙能否自行萌出。IV型A组与B组错殆畸形表现差异在于中切牙反殆,中切牙反殆往往不涉及间隙的丢失,治疗较侧切牙反殆简单。有报道仅拔除多生牙,中切牙反殆即自行矫治的情况^[22]。因而,IV型A组与B组的矫治时长并无明显差异。

综上,I型萌出型和III型牙间埋伏型的正中多生牙在中切牙萌出前拔除、II型冠部埋伏型的正中多生牙在对侧中切牙萌出前拔除可降低恒牙萌出时错殆畸形的复杂情况,同时减少相应的矫治时长。IV型根部埋伏型的多生牙可根据患儿的情况综合考虑择期拔除,如多生牙呈倒置状时也建议尽早拔除,因为随着年龄的增长和牙齿的发育,多生牙的冠部位置加深,拔除时创伤、难度、并发症均会增加。

【Author contributions】 Guo XK, Liu JF collected, analyzed the data and wrote the article. Ding J collected case material and analyzed the data. Man QW reviewed the article. Zhao JH designed the article. All authors read and approved the final manuscript as submitted.

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(编辑 罗燕鸿, 李昉劼)



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