To Evaluate Post Treatment Status Of Palatally Impacted Canines Treated By Open Technique With Free Eruption And Closed Flap Technique

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Abstract:

Background: The upper permanent canine is the tooth with the second highest incidence of impaction after the third molar. The present study was conducted to evaluate post treatment status of palatally impacted canines treated by open technique with free eruption and closed flap technique.

Material and methods: A total 50 patients with a newly diagnosed unilateral palatally impacted maxillary canine were selected to participate in this study divided into 2 groups i.e. Group 1 was palatally impacted canines treated by open technique with free eruption and Group 2 was palatally impacted canines treated by closed flap technique. The intraoral examination included the visual assessment of the color and the shape of the crown of the previously impacted canine, the inclination and the position in the dental arch of the previously impacted canine, its function (occlusal contacts). Statistical analysis was performed using the statistical software package SPSS 20.0 for Windows. The difference was considered to be statistically significant when P<0.05.

Results: In the present study, in 16%, a slightly darker color of the previously impacted canine was observed in group 1 whereas in group 2 8% was observed. In group 1 8% teeth showed cusps with signs of wear whereas in group 2 20% teeth were seen. In group 1, normal tooth position was seen in 60% teeth whereas in group 2, it was 76%. In group 1, normal inclination was seen in 44% teeth whereas in group 2 it was 68%. During the lateral mandibular excursions, in group 1canine protection was observed in 72% whereas in group 2 it was observed in 60%. During the anterior mandibular excursions, normal guidance was detected in 96% of the cases in group 1, whereas in group 2 it was 92%.

Conclusion: The present study concluded that the posttreatment status of palatally impacted canines after the surgical-orthodontic treatment did not differ significantly between the groups of the open and the closed surgical method.

Keywords: surgical-orthodontic treatment, impacted canines, posttreatment.

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Introduction:

The upper permanent canine is the tooth with the second highest incidence of impaction after the third molar, with a prevalence between 1 and 3%. The inclusion of the upper canine shows a predilection for the palatal side and has a prevalence almost three times greater in female patients.[1,2] The prevalence of impacted canines in the orthodontic population was reported between 0.9 and 2.2%[3], and in most of cases, the canines are ectopically positioned. Multiple etiological factors were linked to canine impaction as absence of lateral incisors, anomalies of lateral incisors, lack of guidance, ectopic position of the tooth germ, presence of obstacles to eruption, or genetic factors.[4] The displacement was suggested with higher prevalence on the palatal side.[5] A combined surgical-orthodontic treatment is commonly used to resolve tooth impaction. There are 2 basic surgical methods for the exposure of a palatally impacted canine, i.e., [illegible] impacted tooth is one of the major factors that determine the choice of a surgical exposure method. The surgical-orthodontic treatment should simulate the natural eruption pattern of

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the impacted tooth through the attached gingival tissue. All palatal gingiva is attached; therefore, both the closed and the open surgical methods are appropriate. Other advantages of the surgical techniques are discussed when comparing the operating time and the extent of the surgical procedure[6], the patient's comfort after surgery[7,8], the need for repeated surgery[6,9,10], the time of the eruption/extrusion of the impacted tooth, the overall treatment time.[6,11,12] The present study was conducted to evaluate post treatment status of palatally impacted canines treated by open technique with free eruption and closed flap technique.

Material and methods:

The present study was conducted to evaluate post treatment status of palatally impacted canines treated by open technique with free eruption and closed flap technique. Before the commencement of the study ethical approval was taken from the Ethical Committee of the institute.

A total 50 patients with a newly diagnosed unilateral palatally impacted maxillary canine were selected to participate in this study divided into 2 groups i.e. Group 1 was palatally impacted canines treated by open technique with free eruption and Group 2 was palatally impacted canines treated by closed flap technique..

The inclusion criteria to this prospective study were as follows: nonsyndromic patients with a unilateral palatally impacted maxillary canine, no previous orthodontic treatment; no metabolic disorders or other medical conditions that may influence treatment; and good oral hygiene. The intraoral examination included the visual assessment of the color and the shape of the crown of the previously impacted canine, the inclination and the position in the dental arch of the previously impacted canine, its function (occlusal contacts). Tooth shape was recorded as either a normal cusp or a cusp with signs of wear. Tooth color was recorded as normal or different in comparison with the color of the contralateral side canine. Tooth position was recorded as normal, intrusion (the incisal edge of the canine situated higher compared with the contralateral side canine), mesial rotation (the mesial aspect of the tooth situated labially to the line of the dental arch), or distal rotation (the distal aspect of the tooth situated labially to the line of the dental arch).

Inclination was registered as normal, lingual (the occlusal portion of the tooth crown angulated lingually to the gingival portion relative to the occlusal plane), or buccal (the occlusal portion of the tooth crown angulated buccally to the gingival portion relative to the occlusal plane). Occlusal contacts on the nonworking and working sides were registered during lateral mandible excursions up to 3 mm and during anterior excursions up to the edge-to-edge incisor contact. Statistical analysis was performed using the statistical software package SPSS 20.0 for Windows. The difference was considered to be statistically significant when $P<0.05$.

Results:

In the present study, in 16%, a slightly darker color of the previously impacted canine was observed in group 1 whereas in group 2 8% was observed. In group 1 8% teeth showed cusps with signs of wear whereas in group 2 20% teeth were seen. In group 1, normal tooth position was seen in 60% teeth whereas in group 2, it was 76%. In group 1, normal inclination was seen in 44% teeth whereas in group 2 it was 68%.

During the lateral mandibular excursions, in group 1canine protection was observed in 72% whereas in group 2 it was observed in 60%. During the anterior mandibular excursions, normal guidance was detected in 96% of the cases in group 1, whereas in group 2 it was 92%.

Table 1: Frequency of Posttreatment Canine Shape and Color Abnormality, Malalignment, and Function of Impacted Canines After Surgical-Orthodontic Treatment Applying 2 Different Surgical Methods

Posttreatment Morphology	Function of the Canine	Group 1(n=25)	Group 2(n=25)	P value
Tooth color	Normal	21(84%)	23(92%)	<0.05

	Different	**4(16%)**	**2(8%)**	
Tooth shape	**Normal cusp**	**23(92%)**	**20(80%)**	
	Cusp with signs of wear	**2(8%)**	**5(20%)**	
Tooth position in the dental arch	**Normal**	**15(60%)**	**19(76%)**	
	Intruded	**3(12%)**	**3(12%)**	
	Mesial rotation	**4(16%)**	**0(0%)**	
	Distal rotation	**3(12%)**	**3(12%)**	
Tooth inclination	**Normal**	**11(44%)**	**17(68%)**	
	Lingual	**4(16%)**	**3(12%)**	
	Buccal	**10(40%)**	**5(20%)**	
Lateral mandible excursions	**Canine protection**	**18(72%)**	**15(60%)**	
	Group guidance	**7(28%)**	**4(16%)**	
	Anomalous guidance	**0(0%)**	**6(24%)**	
Anterior mandibular excursions	**Normal guidance**	**24(96%)**	**23(92%)**	
	Anomalous guidance	**1(4%)**	**2(8%)**	

Discussion:

The treatment of impacted canine requires a multidisciplinary approach in which surgery is a fundamental step.[13]When considering a patient for surgical exposure of a labial or intra-alveolar impaction of a maxillary canine, the following four criteria should be evaluated to determine the correct method for uncovering the tooth.First, assess the labiolingual position of the impacted canine crown. The second criterion to evaluate is the vertical position of the tooth relative to the mucogingival junction. The third criterion to evaluate is the amount of gingiva in the area of the impacted canine. The fourth and final criterion to evaluate is the mesiodistal position of the canine crown.[14,15]

In the present study, in 16%, a slightly darker color of the previously impacted canine was observed in group 1 whereas in group 2 8% was observed. In group 1 8% teeth showed cusps with signs of wear whereas in group 2 20% teeth were seen. In group 1, normal tooth position was seen in 60% teeth whereas in group 2, it was 76%. In group 1, normal inclination was seen in 44% teeth whereas in group 2 it was 68%. During the lateral mandibular excursions, in group 1canine protection was observed in 72% whereas in group 2 it was observed in 60%. During the anterior mandibular excursions, normal guidance was detected in 96% of the cases in group 1, whereas in group 2 it was 92%.

Incomplete alignment was also recorded by D'Amico et al.: 3.5 years after an orthodontic treatment, a normal position of treated canines was recorded only in 44%–52% of cases and a normal inclination in 55%–57% of cases.[16]

D'Amico et al. found that the color of treated canines was abnormal in 34% of unilateral impaction cases and in 50% of bilaterally impacted canines.[16]

D'Amico et al., observed cuspid protection and group contact were found in 46%–47% and 49%–53% of cases, respectively.[16]

Conclusion:

The present study concluded that the posttreatment status of palatally impacted canines after the surgical-orthodontic treatment did not differ significantly between the groups of the open and the closed surgical method.

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