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腭側迷你骨釘的使用結果

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摘要

目前在齒列矯正治療中，腭側迷你骨釘被引用於骨性錨定。然而，患者對於使用這種新穎的概念在齒列矯正過程仍然憂心忡忡。這項研究的目的是評估治療使用腭側迷你骨釘植入後的結果。方法：20隻迷你骨釘（直徑：2毫米，長度：8毫米）植入腭側骨當作齒列矯正治療的骨性錨定。結果：所有的腭側迷你骨釘植入鎖在骨骼內5mm. 病人均不需要切開和皮瓣手術來植入迷你骨釘，本次腭側迷你骨釘成功率為100％。結論：骨性錨定使用腭側迷你骨釘可以提高齒列矯正治療的有效性和效率。

關鍵詞：腭骨、迷你骨釘、骨性錨定

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The outcomes of palatal mini-implant anchorage

Running title: Palatal mini-implant anchorage

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Abstract

Background:

Currently, in orthodontic treatments, palatal mini-implants are being used for skeletal anchorage. However, patients remain apprehensive regarding the use of this novel concept in orthodontic procedures. The purpose of this study was to evaluate the outcomes after treatment using palatal mini-implants.

Methods:

For orthodontic treatment, 20 mini-implants (diameter: 2mm; length: 8 mm) were inserted as skeletal anchors into the palatal area.

Results:

All palatal mini-implants were lock-in bone for 5mm.No patient required an incision and flap to insert the palatal mini-implnat. The success rate was 100 %

Conclusions:

Skeletal anchorage using palatal mini-implants could enhance the effectiveness and efficiency of orthodontic treatment.

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Keywords：Palate, Mini-implant, Skeletal anchorage

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Introduction

The success of orthodontic treatment is dependent on consistent anchorage. It is easy for orthodontic treatment to be impeded due to anchorage loss that easily occurs when there is limited intro-oral anchorage and the extra-oral appliance is not readily accepted by patients. Orthodontists have recently become interested in mini-implants which not only provide the skeletal anchorage, but also could improve the quality of orthodontic procedures. In the 1960's the titanium implant was introduced to dentistry by Brånemark et al. Many years later, the success rate has been more than 90% as documented in the English literature[1, 2, 3]. Orthodontists in Asia have been convinced that they should utilize microimplants as a viable orthodontic treatment. Modern orthodontic has now recognized and accepted palatal mini-implant anchorage as an alternative orthodontic treatment. Therefore, our goal in this study was to evaluate the success rate after palatal mini-implant treatment.

Materials and methods

Twenty palatal mini-implants were implanted in 20 patients for skeletal anchorage in orthodontic treatment procedures at the Department of Orthodontic, Kaohsiung Medical University Chung-Ho Memorial Hospital. of the 20 patients, 18 were women and 2 were men. The mean age of the patients was 27.6 years. The application of orthodontic force was started 3 weeks after palatal mini-implant placement. A force of 100-200g was loaded with an elastometric chain. The criteria for successful insertion of mini-implants were as follows: (1) the mini-implant could resist orthodontic force until removal (2) there was no persistent inflammation or infection. Screw failure, which resulted in the removal of the mini-implant, occurred when there was significant mobility of a mini-implant that could not sustain the orthodontic force, or when there was persistent infection or inflammation that did not subside after local cleaning and antibiotic treatment.

Results

The diameter of the mini-implants was 2 mm, and the lengths were 8 mm (Figure 1). All palatal mini-implants were lock-in bone for 5mm.No patient required an incision and flap to insert the palatal mini-implant. The placement time was about 10 to 15 minutes. After orthodontic force loading (Figure 2), no palatal mini-implant was failure before removal. The palatal mini-implant was used as skeletal anchorage at least 6 months.

Discussion

Anchorage control is the principle concern of orthodontic treatment. A random trial was reported by Feldmann and Bondemark[4] regarding the conventional anchorage systems using headgear and transpalatal appliances and the skeletal anchorage capability of osseointegrated palatal implants(Straumann, Basal, Switzerland). They found that implant groups had much greater anchorage success rates compared to the headgear and transpalatal bar groups. Arcuri[5] did a five year study on orthodontic anchorage and the use of palatal mini-implants(Straumann, Basal, Switzerland). They reported that more than 90% of the implants have been successfully connected, and verified to be an adjacent device for orthdontic treatment. Therefore, palatal orthodontic

implants (Straumann, Basal, Switzerland) and conventional dental implants have similar success rates.

Although Straumann's palatal implants have a high success rate, but they need to utilize flap operations for insertion and removal producers due to its 3 mm diameter. Recently, a smaller diameter palatal mini-implant (2mm) has been developed to direct insertion in stead of flap surgery. In our series, we used 20 palatal mini-implants(diameter：2mm; length: 8 mm) and overall success rate was 100% during usage of palatal mini-implants. Jackson et al.[6] did a comparison study regarding stability of delayed loading vs immediate loading of orthodontic palatal implants. The results showed a significant difference in the delayed and immediately loaded groups. Delayed palatal implants are more stable after an 8-week healing period, as compared to implants that are immediately loaded. In our patients, palatal mini-implants always were loaded orthodontic force 3-week after insertion.

Kang et al.[7] used computed tomography evaluation of palatal bone thickness for orthodontic mini-implant placement. Thickest bone (＞5 mm) was found in the anterior palate, median suture, and paramedian areas. The midpalatal area within 1 mm of the midsagittal suture had the thickest bone available in the whole palate. The thickness tended to decrease laterally and posteriorly. There was a significant difference between the male and female groups. The men had greater mean values for most areas, near the posterior midsagittal palate. In our series, mini-implants were inserted into palatal paramedian area about 5 mm.

The palatal mini-implant anchorage is a new technique and treatment option in current orthodontic therapy. Naturally, patients are always concerned about the differences between conventional and new concepts of treatment. Therefore, new skills must contribute a better outcome to persuade patients and orthodontists alike to willingly trust the new modality of treatment, and address the sequela of suffering to relieve patient uncertainty.

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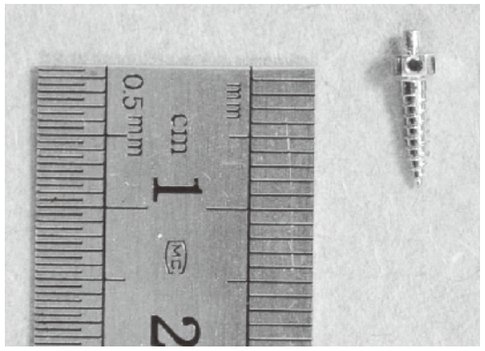

Figure 1. Palatal mini-implants (2.0 × 8 mm; Bioray®, Bio-Ray Biotech Corp, Taipei, Taiwan).

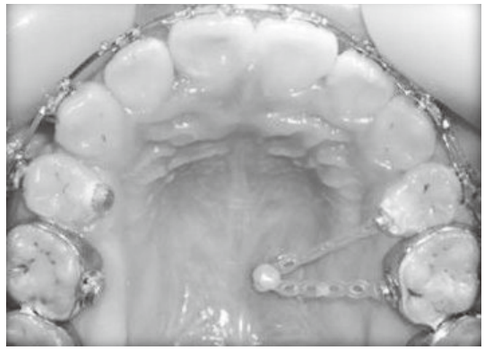

Figure 2. Bioray® mini-implant was inserted into palatal paramedian area.

Table 1 The summary of palatal mini-implant (n = 20)*

Gender	Male: 2; Female: 18
Age (yr)	Mean: 27.6; range: 18 to 44
Palatal min-implant	
	Diameter: 2 mm; Length: 8 mm
Average follow-up	≧ 6 months
Overall success rate: 100 %	

*n = number of palatal mini-implants