European Journal of Molecular & Clinical Medicine

ISSN 2515-8260 Volume 07, Issue 11, 2020

Assessment of clinical success of Miniscrew Implants for Orthodontic Treatment: An observational study

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ABSTRACT:
Background: Mini-screw implants are a compliance-free alternative to more traditional forms of incisor intrusion. Hence; the present study was undertaken for assessing the clinical success of Miniscrew Implants for Orthodontic Treatment.**Materials & methods:**The present study was undertaken for assessing the clinical success of Miniscrew Implants for Orthodontic Treatment. A total of 30 patients scheduled to undergo mini-screw implants as a part of orthodontic treatment were enrolled. Complete demographic details of all the patients were obtained. A Performa was made and thorough details of the clinical examination of all the patients were recorded. All the surgical procedures were carried out under adequate septic conditions. All the patients were recalled on follow-up and success rate was assessed. **Results:**Maxillary arch was involved in 70 percent of the patients. In the present study, clinical success rate of mini-screw implants was 96.67 percent. Significant results were obtained while comparing the success rate and failure rate. **Conclusion:** Miniscrew Implants for Orthodontic Treatment are accompanied by high success rate.
Key words: Orthodontic, Mini-screw, Implants

INTRODUCTION

Mini-screw implants are a compliance-free alternative to more traditional forms of incisor intrusion. It has recently been developed. They are smaller than regular dental implants and have the advantages of reducing patient compliance, immediate loading, uncomplicated placement, and minimal expense for patients. Mini-screw implants have also been successfully used for intruding teeth because they make it possible to apply light continuous forces of known magnitudes. Better control of the forces could decrease external apical root resorption, which often associated with intrusive movements.[1-3]

Stability refers to the resistance to reactive forces, offered by teeth or other oral or extraoral structures that would lead to unwanted movements. In the case of mini-implants, two types of stability can be distinguished: primary and secondary. Primary stability is mechanical and is achieved by the mini-implant compressing the bone during insertion, while secondary, or

biological stability, begins at the moment of placement and increases during the bone remodeling or healing process.[4- 6]Hence; the present study was undertaken for assessing the clinical success of Miniscrew Implants for Orthodontic Treatment.

MATERIALS & METHODS

The present study was undertaken for assessing the clinical success of Miniscrew Implants for Orthodontic Treatment. A total of 30 patients scheduled to undergo mini-screw implants as a part of orthodontic treatment were enrolled. Complete demographic details of all the patients were obtained. A Performa was made and thorough details of the clinical examination of all the patients were recorded. All the surgical procedures were carried out under adequate septic conditions. Exclusion criteria for the present study included:

- Patients with history of any other systemic illness,
- Patients with any known drug allergy
- Patients with history of any metabolic bone disorder

All the patients were recalled on follow-up and success rate was assessed. All the results were recorded and analyzed by SPSS software. Chi-square test was used for evaluation of level of significance.

RESULTS

In the present study, a total of 30 patients were analyzed. Mean age of the patients was 18.6 years. Right side was involved in mini-screw implant process in 53.33 percent of the patients. 60 percent of the patients were males while the remaining were females. Maxillary arch was involved in 70 percent of the patients. In the present study, clinical success rate of mini-screw implants was 96.67 percent. Significant results were obtained while comparing the success rate and failure rate.

Table 1: Demographic variables

Variable		Number	Percentage
Mean age (years)		18.6	
Gender	Males	18	60
	Females	12	40
Side involved	Left	14	46.67
	Right	16	53.33
Jaw involved	Maxillary arch	21	70
	Mandibular arch	9	30

Table 2: Clinical success

Clinical outcome	Number	Percentage
Success	29	96.67
Failure	1	3.33
p- value	0.000 (Significant)	

DISCUSSION

Mini-screw implants, often referred to as temporary anchorage devices (TADs), have become an accepted component of orthodontic treatment. The comparatively simple technique for the placement of these mini-screws is described with emphasis on the importance of correct site selection as well as an understanding of the possible complications that may arise. The application and description of appliances incorporating mini-screws are described with the aid of typodont models and clinical examples. While the technique is of primary relevance to orthodontists, the use of mini-screws as an aid for pre-prosthodontic tooth movement is also

of relevance to prosthodontists.[6- 8]Hence; the present study was undertaken for assessing the clinical success of Miniscrew Implants for Orthodontic Treatment.

In the present study, a total of 30 patients were analyzed. Mean age of the patients was 18.6 years. Right side was involved in mini-screw implant process in 53.33 percent of the patients. 60 percent of the patients were males while the remaining were females. Maxillary arch was involved in 70 percent of the patients. Joanna Antoszewska et al investigated factors significantly contributing to the success rates of MIs in various orthodontic treatment procedures in white patients. In total, 350 self-tapping (187 Abso Anchor [Dentos, Daegu, South Korea] and 163 Ortho Easy Pin [Forestadent, Pforzheim, Germany]) MIs used to reinforce orthodontic anchorage and placed in 130 consecutively chosen patients were assessed retrospectively. Clinical variables possibly influencing the success rates of MIs were categorized into patient-related, implant-related, location-related, and orthodontic-related. Statistical evaluation included descriptive statistics and survival analysis. The overall success rates of MIs that remained stable during a mean treatment time of 19.2 +/- 2.3 months was 93.43%; this was considerably higher than in previous reports. Only a few factors were found to be associated with statistically significant higher success rates of MIs, including deep bites, placement in the attached gingiva of the maxilla, and en-masse distalization of teeth. The success rates of MIs in white patients were greater than the corresponding rates reported for Asian patients.[10]

In the present study, clinical success rate of mini-screw implants was 96.67 percent. Significant results were obtained while comparing the success rate and failure rate. Jing Z et al evaluated the various factors that influence the success rate of miniscrew implants used as orthodontic anchorage. Potential confounding variables examined were sex, age, vertical (FMA) and sagittal (ANB) skeletal facial pattern, site of placement (labial and buccal, palatal, and retromandibular triangle), arch of placement (maxilla and mandible), placement soft tissue type, oral hygiene, diameter and length of miniscrew implants, insertion method (predrilled or drill-free), angle of placement, onset and strength of force application, and clinical purpose. One hundred fourteen patients were included with a total of 253 miniscrew implants. The overall success rate was 88.54% with an average loading period of 9.5 months in successful cases. To minimize the failure of miniscrew implants, proper oral hygiene instruction and effective supervision should be given for patients, especially young (< 12 years) high-angle patients with miniscrew implants placed in the mandible.[11]In another study conducted by Topouzelis N et al, authors assessed the correlation of various clinical indicators with the success or failure of miniscrews used for anchorage during orthodontic treatment. Thirty-four consecutive patients with a cumulative total of 82 miniscrews implanted participated in the study. Generalized Estimating Equations were used to assess the correlation of various factors with success rates. The miniscrew was considered the unit of analysis clustered within site and within patient. The overall success rate of miniscrews was 90.2%. For every additional miniscrew used in a patient's oral cavity, the success rate was reduced by 67%.[12]

CONCLUSION

Miniscrew Implants for Orthodontic Treatment are accompanied by high success rate.

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