Journal of Advanced Medical and Dental Sciences Research

@Society of Scientific Research and Studies ***NLM ID:*** *101716117*

Journal home page: www.jamdsr.com doi: 10.21276/jamdsr Index Copernicus value = 85.10

(e) ISSN Online: 2321-9599; (p) ISSN Print: 2348-6805

Original Research

Retrospective evaluation of 79 patients with Orthodontic Miniscrew Implants: An observational study

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ABSTRACT:
Background: Anchorage plays a significant role in the success of orthodontic treatment outcomes. Many authors have acclaimed miniscrews as the future in temporary skeletal anchorage devices in daily clinical practice. Hence; the present study was planned for retrospective evaluating 79 patients with orthodontic miniscrew implants. **Materials & methods:** Data of a total of 79 patients who underwent orthodontic mini-implant procedures were enrolled. A Performa was framed and details clinical and intro-oral details were recorded from data record files. Radiographs of all the patients were retrieved. Complete analysis of radiographs was done. Follow-up radiographs were also obtained and were analysed. Prognosis was classified as success or failure. Patients in which loosening of implant was reported on follow-up were classified as failure cases. All the results were recorded in Microsoft excel sheet and were analysed by SPSS software. **Results:** Implants placed were supported by removable prosthesis in 22 cases while they were supported by fixed prosthesis in 57 cases. Mini-implant failure occurred in 5 cases. Hence; the overall survival (prognosis) rate of orthodontic mini-implants was 93.67 %. **Conclusion:** Orthodontic mini-implants have excellent prognosis when placed with adequate care.
Key words: Orthodontic, Mini-screw implants

Received: 23/07/2020 **Modified:** 20/08/2020 **Accepted:** 24/08/2020

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This article may be cited as: Bagalkot KB, Kalsi S, Singh J, Sabharwal P. Retrospective evaluation of 79 patients with Orthodontic Miniscrew Implants: An observational study. J Adv Med Dent Scie Res 2020;8(9):91-93.

INTRODUCTION

Anchorage plays a significant role in the success of orthodontic treatment outcomes. Some efforts have been made to gain the optimum anchorage intra or extra orally such as using chin cap, headgear, and multiple brackets. Both anchorage devices and techniques are accompanied by some deficiencies. Extra oral anchorage requires remarkable patient's cooperation which is not mostly achieve. Once mini-implants were introduced with a view to aiding orthodontic treatment, they allowed unwanted effects to be minimized or even eliminated, thereby favoring tooth movement mechanical control. This resource caused major changes in current orthodontic treatment.[1-3]

Potential sites for mini-implant insertion in the maxilla comprise interradicular space, the infrazygomatic crest and the hard palate. In terms of skeletal anchorage, the anterior hard palate is especially advantageous since root damage is very unlikely in this area. Furthermore, it provides good bony support. Median and paramedian insertion as

well as various mechanics have been described. According to recent studies, the success rate of miniscrews has significantly increased and is now about 90%.[4, 5] Many authors have acclaimed miniscrews as the future in temporary skeletal anchorage devices in daily clinical practice. However, because nearly 10% of miniscrew implants (MIs) still fail, it is hard to believe the claims that they have become fully reliable anchorage devices.[6, 7] Hence; the present study was planned for retrospective evaluating 79 patients with orthodontic miniscrew implants.

MATERIALS & METHODS

The present study was conducted with the aim of retrospectively evaluating 79 patients with orthodontic miniscrew implants. Data of a total of 79 patients who underwent orthodontic mini-implant procedures were enrolled. Ethical approval was obtained from institutional ethical committee. A Performa was framed and details clinical and intro-oral details were recorded from data record files. Radiographs of all the patients were retrieved. Complete analysis of radiographs was done. Follow-up radiographs were also obtained and were analysed. Prognosis was classified as success or failure. Patients in which loosening of implant was reported on follow-up were classified as failure cases. All the results were recorded in Microsoft excel sheet and were analysed by SPSS software. Chi- square test was used for evaluation of level of significance.

RESULTS

In the present study, data of a total of 79 patients who underwent orthodontic mini-implant procedures were analysed. Mean follow-up time period was found to be 3.8 years. Out of 79 cases, maxillary implants were placed in 49 cases while mandibular implants were placed in 30 cases. Implants placed were supported by removable prosthesis in 22 cases while they were supported by fixed prosthesis in 57 cases. Mini-implant failure occurred in 5 cases. Hence; the overall survival (prognosis) rate of orthodontic mini-implants was 93.67 %. However; while analysing the distribution of prognosis of mini-implants with arch wise-distribution of cases, non-significant results were obtained.

Table 1: Demographic data

Parameter		Number of patients	Percentage of patients
Mean age (years)		21.5	
Gender	Males	33	41.77
	Females	46	58.23
Arch	Maxillary	49	62.03
	Mandibular	30	37.97
Appliance	Removable	22	27.85
	Fixed	57	72.15

Table 2: Prognosis

Prognosis	Number of patients	Percentage of patients
Success	74	93.67
Failure	5	6.33

DISCUSSION

Significant alteration in the Implant dentistry has occurred over past couple of decades leading to drastic improvement in the prognosis. The field of dental implantology has evolved rapidly over a period of time. Even though technology has enhanced significantly over the past several years, and some conventional implant systems allow for early loading, most conventional endosseous fixtures require up to 4 to 6 months or longer before prosthetic restoration can be completed. In addition, often times these larger-diameter implants require sinus lift procedures and bone augmentation. The relatively lower cost of mini dental implants allows for a larger patient-selection base. Mini dental implants were initially designed for the temporary stabilization of a prosthesis during the healing period of conventional implants. Recently, they have become popular in use for orthodontic anchorage, periodontal therapy, fixed prosthetics, and complete denture stabilization.[7- 9] Hence; the present study was planned for retrospective evaluating 79 patients with orthodontic miniscrew implants.

In the present study, data of a total of 79 patients who underwent orthodontic mini-implant procedures were analysed. Mean follow-up time period was found to be 3.8 years. Out of 79 cases, maxillary implants were placed in 49 cases while mandibular implants were placed in 30 cases. Antoszewska J et al analysed the factors that suggestively contributed to the success of mini-implants in various orthodontic treatment procedures. They evaluated a total of 350 self-tapping and 163 Ortho Easy Pin MIs used with the purpose of reinforcing orthodontic anchorage. They categorized the clinical parameters into patient-related, implant-related, location-related, and orthodontic-related. They observed stable overall success rates of 93.43 percent for MIs over a mean follow-up period of 19.2 months. Deep bites, insertion of MI in the attached gingiva and en-masse distalization of teeth were the factors found to be significantly associated with higher success rate.[10]

In the present study, implants placed were supported by removable prosthesis in 22 cases while they were supported by fixed prosthesis in 57 cases. Mini-implant failure occurred in 5 cases. Hence; the overall survival (prognosis) rate of orthodontic mini-implants was 93.67 %. In another study conducted by Ziebura T et al, authors identified insertion procedure and force application related complications in Jet Screw (JS) type mini-implants when inserted in the palatal slope. They analysed 41 consecutive patients which were treated using mini-implants in the palatal slope. They assessed 66 JS cases and evaluated complete patients records. Implant loss was seen in 2 cases

while in another two cases, implant loosening occurred while still serving for anchorage. Complications that required treatment did not occur, the most severe problem observed being gingival proliferation which was attributable neither to patients' age nor to applied mechanics or deviations from the ideal implant position.[11]

In the present study, while analysing the distribution of prognosis of mini-implants with arch wise-distribution of cases, non-significant results were obtained. Shatkin TE et al, in another study, described retrospective analysis of 5640 mini dental implants placed into 1260 patients over a 12-year period. The mean follow-up time in their study was 3.5 years. The implants placed supported removable (2319) and fixed prostheses (3321), with placement in the maxilla (3134) and mandible (2506). The overall implant survival was 92.1%. Failures of implants (445) were attributed to mobility of the implant; the mean time to failure for these implants was 14.4 months. The small size of these implants has led to the development of techniques that enable placement and use in a short amount of time for both the doctor and patient. The high rates of success show that mini dental implants are suitable for use in supporting fixed and removable prosthetics.[12]

CONCLUSION

From the above results, the authors concluded that orthodontic mini-implants have excellent prognosis when placed with adequate care.

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