# Assessment of clinical success of mini screw implant for orthodontic treatment

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#### Abstract

**Background**: This study was carried out for the assessment of clinical success of mini screw implant for orthodontic treatment.

**Material and methods**: In this study, 50 patients were enrolled for mini-screw implantation as part of their orthodontic therapy. Comprehensive demographic information of all the patients was acquired. A comprehensive clinical examination was conducted. The surgical procedures were performed under optimal aseptic circumstances. The patients were summoned for a follow-up and the success rate was evaluated. The results were examined using the SPSS program. The chi-square test was employed to assess the statistical significance.

**Results**: This study enrolled a total of 50 patients. The patients' average age was 19 years. The mini-screw implant procedure affected the right side in 61% of patients. Males made up 78% of the patient population and females 22%. In 67% of the cases, the maxillary arch was affected. The current study found that mini-screw implants had a 97% clinical success rate. When comparing the success rate with the failure rate, significant findings were found. **Conclusion**: A high success rate is often associated with orthodontic treatments that include miniscrew implants.

Keywords: Mini screw implants, orthodontics, anchorage, treatment.

## Introduction

Anchorage control is one of the key issues to be taken into account when planning orthodontic treatment. Expectations are not always met, despite the applied different anchorage reinforcement protocols. Most of conventional anchorage devices require either the patients' compliance or they load patients' teeth, thus leading to their uncontrolled, mostly undesired movement. [1–5]Temporary intraoral skeletal anchorage devices (TISAD/TAD) have many advantages, such as low price, ease of insertion and removal, and rare complications related to their application, but most of all they ensure excellent biomechanics of tooth movement and anchorage control, even in uncooperative patients. [5–7]Primary stability may be increased when the miniscrew is inserted at angles of 60oto 70oin relation to the bone surface, in regions with thicker cortical bone, but for this purpose a higher torque is demanded for its insertion. However, this increased angulation may cause a higher failure rate due to excessive pressure on the bone. 6The bone density in the posterior region of the maxilla is lower than it is in the mandible, and this area also presents a thin vestibular cortical. [8,9]Hence, this study was carried out for the assessment of clinical success of mini screw implant for orthodontic treatment.In this study, 50 patients were enrolled for mini-screw implantation as part of their acquired. A comprehensive clinical examination was conducted. The surgical procedures were performed under optimal aseptic circumstances. The patients were summoned for a follow-up and the success rate was evaluated. The results were examined using the SPSS program. The chi-square was employed to assess the statistical test significance.

## Results

Table 1: Gender-wise distribution of subjects.					
Gender	Number of subjects	Percentage			

Males	39	78%
Females	11	22%
Total	50	100%

This study enrolled a total of 50 patients. The patients' average age was 19 years. The mini-screw implant procedure affected the right side in 61% of patients. Males made up 78% of the patient population and females 22%. In 67% of the cases, the maxillary arch was affected.

Clinical outcome	Number of cases
Success	49(98%)
Failure	01(02%)
Total	50(100%)

Table 2:	clinical	outcome	of implants.	
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The current study found that mini-screw implants had a 98% clinical success rate. When comparing the success rate with the failure rate, significant findings were found.

## Discussion

The limitations of traditional tooth movement have been overcome by orthodontic mini-screws, [10-15] and mini-screws are now increasingly applied in dentistry. Orthodontic mini-screws are used to improve orthodontic treatment efficiency and have been gaining popularity because of their simple insertion procedure and non-requirement of patient cooperation. However, use of mini-screws does not always guarantee treatment success, and stability of the mini-screw is essential for promoting anchorage. Orthodontic mini-screws are mostly inserted by the self-drilling method using hand drivers. [16,17] Various articles on orthodontic mini-screw placement have reported the use of motor-driven handpieces. Mini-screws can be inserted using endodontic contraangle or surgical implant motors and handpieces. [10-12]Hence, this study was carried out for the assessment of clinical success of mini screw implant for orthodontic treatment. This study enrolled a total of 50 patients. The patients' average age was 19 years. The mini-screw implant procedure affected the right side in 61% of patients. Males made up 78% of the patient population and females 22%. In 67% of the cases, the maxillary arch was affected. The current study found that mini-screw implants had a 97% clinical success rate. When comparing the success rate with the failure rate, significant findings were found.Gurdan Z et al [18] in their study, calculated the success and complication rates of orthodontic miniimplants.In this retrospective study, patients of their orthodontic department were enrolled, getting overall 59 orthodontic mini-implants during their orthodontic treatment in a 2-year period. Every patient had one or more of the 1.6 mm × 8 mm in size self-drilling miniimplants. Screw loading was performed immediately after insertions, keeping tension forces under 150 g. Soft tissue and bone infections, implant mobility and screw loss, implant fracture, and neighboring tooth injury were registered. Relationships between variables were tested using the Chi-square test for statistical significance. The success rate of the orthodontic mini-implants was 89.8% in this study while the average loading period was 8.1 months. Soft-tissue infections varied between 6.3% and 33.3% of the cases while screw mobility varied between 3.1% and 20.8% of the cases regarding the anatomic localization. Screw mobility was significantly more frequent in the buccal fold than in the palate (P =0.034). Screw mobility was significantly more frequent in the buccal fold than in the palate (P =0.034) and screw mobility was found more frequently in case of intrusions than by extrusions (P =0.036). The overall success rate of mini-implants was found acceptable in this study, however, screw mobility in the buccal fold showed a high incidence, suggesting the thorough consideration of the immediate loading buccal by miniimplants.Motoyoshi etal[19] examined the success rate of mini-screws in 57 patients (aged 11.7-36.1) undergoing orthodontic treatment. The aim of skeletal anchorage was to retract the front teeth following the extraction of the upper premolar teeth, loaded with 2 N orthodontic forces. Poorest results (63.8%) were found in teenagers who received the force load within <1 month. In similar interventions, if the load to the mini-screw started only 3 months later, treatment was more successful (97.2%).

## Conclusion

A high success rate is often associated with orthodontic treatments that include miniscrew implants.

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