



REVIEW

Mini Implants – A Review

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ABSTRACT: A common condition in elderly patients is edentulism, which can be the result of many factors such as systemic disorders, poor oral hygiene, dental caries and periodontal disease. The edentulous condition has been shown to have a negative impact on the oral-health related quality of life. Over the past 2 decades, oral implants which are widely used in the replacement of missing teeth (partial/complete) provide optimum satisfaction and improved quality of life for the patients. However, the determinant factors in the success rate of implants are the quality and quantity of available bone. Mini-implants are nowadays used as an alternative to conventional implants in areas with compromised bone. This review focuses on the role of mini-implants in the rehabilitation of edentulous patients.

Key words: *mini-implants, narrow diameter implants, small diameter implants*

AUTHOR & YEAR	IMPLANT DIAMETER	AREA OF INSERTION	OBSERVATION OF THE STUDY
Polizzi et al (1999)⁶	3mm diameter implants - 30	Replacing single maxillary and mandibular incisors	A success rate of 96.7% with a minimum marginal bone loss which were in function for 3-7years.
Vigolo P (2000)¹²	52 mini-implants	5 year retrospective study of single-tooth restorations	The mini-implants achieved rehabilitation similar to that of standard single-tooth implant restoration with total implant survival rate of 94.2%.
Anderson et al (2001)¹³	Comparison of the performance of narrow diameter, self-tapping implants and standard self-tapping implants	Maxillary anterior region	The cumulative success rate as well as the marginal bone resorption remained to be the same in both groups.
Dilek OC & Tezulas E (2007)⁵	Single 2.4mm (square head) implant	Immediate loading of the implant in an edentulous area of the maxilla.	No bone resorption and no inflammation were observed in a 12 month follow-up.
Zinsli B et al (2004)¹⁴	3.3mm implants	149 partially or completely edentulous patients.	The cumulative 5 year survival rate of the implants was 98.7% (96.6% after 6 years).
Vigolo P et al (2004)¹⁵	Small diameter implants (either 2.9mm or 3.25mm)	Single-tooth and multiple-implant restorations in a 7 year prospective study.	The total implant survival rate was 95.3%.
Kim JW et al (2005)¹⁶	Mini implant with 1.8mm diameter and 13mm length	Maxillary right lateral incisor	Clinical & radiographic examination revealed minimal bone level changes & maintenance of soft tissue health 6 months post-operatively.
Griffitt et al (2005)²	116 mini implants placed in 30 patients	Each patient received 4 implants placed between the mental foramina in the mandible.	Patients were found to be satisfied with the retention, comfort, chewing & speaking ability with the dentures.
Comfort et al (2005).¹⁷	Narrow platform implants with 3.3mm diameter	23 machined screw-shaped NP implants were placed in nine patients.	a success rate of 96% on clinical and radiographic evaluation
Bulard et al (2005)¹⁸	A multi clinic study of 1,029 mini-implants	Used for mandibular denture retention.	An overall success rate of 91.2%.
Romeo et al (2006)¹⁹	Narrow diameter implants (3.3mm) were compared with the standard diameter implants (4.1mm).	Over a period of 7 years	Narrow diameter implants had similar success rate as that of standard diameter implants.
Bansal R et al (2006)²⁰	Implant of 2.3mm diameter and 14mm in length	Replacing maxillary central incisors	Final prosthesis was successfully functioning during two and half years of follow-up.
Dilek OC & Tezulas E (2007)⁵	2.4mm (square head) implant	Placed in an edentulous area of the maxilla & loaded immediately.	No bone resorption and no inflammation were observed in a 12 month follow-up.

Shatkin TE et al (2007)²¹	2514 mini implants	Supporting single crowns, FPD, RPD& CD over a period of 5 years	overall success rate to be 94.2%
Flanagan D (2008)¹¹	Mini – implants	In the fresh extraction sockets of mandibular anteriors	Successfully functioning (Clinically & radiographically) for 2 years with no complications.
Degidi et al (2008)²²	Retrospective study of 510 narrow diameter implants (< 3.75mm)	Followed for an average period of 20 months (3-96months)	NDIs had a high success rate similar to that of regular implants.
Laberre et al (2008)⁸	626 fixtures (mini-implants)	supporting mandibular dentures.	cumulative success rate over a six year period to be 92.6% with high patient satisfaction. ⁸
Degidi et al (2009)²³	Immediate restoration of 93 3mm diameter implants	In partial posterior edentulous areas of 40 evaluated for a period of 4yrs.	All implants were clinically stable at 6 month follow-up with mean marginal bone loss of 1.16±0.90mm at the 48 month follow-up.
Degidi et al (2009)²⁴	Immediate restoration of 3mm implants evaluated over a period of 3yrs.	Maxillary lateral incisor in 60 patients.	Clinically stable and performed similar to one stage loaded implants.
Franco M (2009)²⁵	94 different narrow diameter implants (<3.75mm) in 36 patients	Placed in homologous fresh frozen bone grafts	Success rate found to be similar to regular and narrow diameter implants inserted in non-grafted jaws.

CONCLUSION

Dental implants have been the most influential change in dentistry during the last half – century. With the data projected in this article, small diameter implants showing success rate comparable to that obtained with standard or wide diameters implants, they may be considered the treatment of choice in cases when space related difficulties exist. The mini or small – diameters or narrow – diameter implant (<3mm diameter) concept is making an impact on the profession amid controversy and debate. The use of narrow diameter or mini-implants is potentially one of the solutions to the in-affordability dilemma. Further research is needed to find suitable alloys, appropriate abutment design and the service potential of these small implants over many years.

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