



# **SCIENTIFIC** **HIGHLIGHTS**

Short overviews on recently  
published scientific evidence.

Issue **1**/2025

*Edited by Dr. Marcin Maj*

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### EDITOR'S CHOICE

#### **In Vitro Evaluation of Bacterial Adhesion of Streptococcus mutans and Enterococcus faecalis on Sand-Blasted, Acid-Etched, and Anodized Titanium Dental Implants**

*(Vamshi Nizampuram et al. 2025)*

and

#### **Aesthetic Clinical Case for Immediate Implant Therapy for Maxillary Central Incisors**

*(Gerardo Guzman et al., 2025)*

#### **Narrow Versus Standard Diameter Implants for Supporting Single Crown Restorations in the Posterior Jaw: A Randomised Controlled Trial**

*(Momen A Atiehet et al., 2025)*

## EDITOR'S CHOICE

J Long Term Eff Med Implants. 2025;35(1):45-49

### In Vitro Evaluation of Bacterial Adhesion of *Streptococcus mutans* and *Enterococcus faecalis* on Sand-Blasted, Acid-Etched, and Anodized Titanium Dental Implants

Vamshi Nizampuram, Arvina Rajasekar

#### STUDY OBJECTIVES AND METHODS

The purpose of this study was to compare the bacterial adhesion of *S. mutans* and *Enterococcus faecalis* on sand-blasted acid-etched and anodized titanium dental implants. Three commercially available implants, namely SLA (n = 3), SLActive (n = 3), and TiUnite (n = 3), were inoculated with the prepared broth suspension of *S. mutans* and *E. faecalis*, and were incubated at 37°C for 48 h. After incubation, the colonies were counted using direct microscopy and the results were recorded as colony forming units/mL (CFU/mL). Mean CFUs were compared between the three implants by ANOVA and pairwise comparison by Tukey's HSD post hoc test using SPSS Software. p value of < 0.05 was considered to be statistically significant.

#### RESULTS

- TiUnite implant showed the highest bacterial adherence for *S. mutans* ( $3.49 \pm 0.53 \times 10^2$  CFU/mL) and *E. faecalis* ( $35.14 \pm 1.54 \times 10^2$  CFU/mL) followed by SLA and SLActive.
- These data demonstrated statistically significant differences between the three types of implants ( $P < 0.05$ ). Pairwise comparison showed that there was a statistically significant difference between SLA and TiUnite ( $P = 0.004$ ) and SLActive and TiUnite ( $P = 0.001$ ) in terms of *S. mutans* colony count.
- In terms of *E. faecalis* colony count, there was a statistically significant difference between SLA and SLActive ( $P = 0.000$ ), SLA and TiUnite ( $P = 0.000$ ) and SLActive and TiUnite ( $P = 0.000$ ).

#### CONCLUSIONS

Compared with sand-blasted and acid-etched dental implants, anodized dental implants showed higher adhesion of *S. mutans* and *E. faecalis*.

Adapted from V Nizampuram et al., J Long Term Eff Med Implants. 2025;35(1):45-49, for more info about this publication click [HERE](#)

Case Rep Dent. 2024 Dec 3:2024:4199406

## Aesthetic Clinical Case for Immediate Implant Therapy for Maxillary Central Incisors

Gerardo Guzman, Silvia Rojas-Rueda, Franciele Floriani, Carlos A Jurado, Francisco X Apiazu-Flores, Nicholas G Fischer



### STUDY OBJECTIVES METHODS AND RESULTS

This case report features a female patient with the chief complaint of needing to replace an anterior crown. After a comprehensive oral assessment and cone beam computed tomography (CBCT) radiographic examination, it was determined that the crown on Tooth #9 was subgingivally fractured. The procedure involved atraumatic extraction of Tooth #9, followed by immediate implant placement. Xenograft bone graft material was placed to complete the space between the buccal bone and the implant. A connective tissue graft (CTG), 1 mm thick and 5 mm wide, was harvested from the palate and placed. The final implant crown was restored using a prefabricated abutment with a titanium base and zirconia ceramic dental material.

### CONCLUSIONS

A well-planned combined treatment, including atraumatic tooth extractions for immediate implants and ideal contouring of soft tissues, can significantly impact the outcome of aesthetic restorations. A single immediate implant-supported crown in the aesthetic zone was able to fulfill the patient's aesthetic expectations at the 2-year follow-up.

Adapted from G Guzman et al., Case Rep Dent. 2024 Dec 3:2024:4199406, for more info about this publication click [HERE](#)

Int Dent J. 2025 Jan 25;S0020-6539(25)00009-7

## Narrow Versus Standard Diameter Implants for Supporting Single Crown Restorations in the Posterior Jaw: A Randomised Controlled Trial

Momen A Atieh, Sunyoung Ma, Andrew Tawse-Smith, Warwick J Duncan, Fatemeh Amir-Rad, Maanas Shah, Haifa Hannawi, Zaid H Baqain, Nabeel H M Alsabeeha

### STUDY OBJECTIVES AND METHODS

The aim of this study was to assess clinical, radiographic and patient reported outcomes of narrow versus standard diameter titanium zirconium (TiZr) implants supporting single crown restorations in posterior sites with limited bone width. Participants requiring replacement of single missing posterior teeth with implant-supported crowns were randomly allocated into 2 treatment groups: narrow (3.3 mm) or standard (4.1 mm) diameter implant. All implants were restored with screw-retained monolithic zirconia crowns. The changes in marginal bone level (MBL) were assessed at the time of delivery of definitive crown and after 1 year of function. Implant stability was measured at placement, 3 and 12 months. Implant success, pink esthetic score (PES), peri-implant parameters, and patient satisfaction were also evaluated.

### RESULTS

- A total of 20 participants with 20 implant-supported single crowns completed the 1-year follow-up.
- All implants were successful. The narrow diameter implants had a higher bone remodeling of  $0.39 \pm 0.92$  mm after 1 year of loading compared with only  $0.10 \pm 0.29$  mm for the standard diameter implants but the difference was not statistically significant ( $P = .40$ ).
- There were no statistically significant differences between the 2 implant groups in terms of PES and peri-implant outcomes.

### CONCLUSIONS

Narrow and standard-diameter TiZr implants supporting screw-retained monolithic zirconia crowns in the posterior region were reliable treatment modalities with comparable clinical, radiographic and patient reported outcomes after 1 year of function. Patient satisfaction was high in both treatment groups.

Adapted from MA Atieh et al., Int Dent J. 2025 Jan 25;S0020-6539(25)00009-7, for more info about this publication, click [HERE](#)

Quintessence Int. 2025 Jan 13;0(0):0

## Osteoporosis' effects on dental implants osseointegration and survival rate: a systematic review of clinical studies

Jamil A Shibli, Viviane Naddeo, Khalila C Cotrim, Eduardo C Kalil, Erica Dorigatti de Avila, Fernanda Faot, Leonardo P Faverani, João Gabriel S Souza, Juliana Campos Hasse Fernandes, Gustavo Vicentis Oliveira Fernandes

### STUDY OBJECTIVES AND METHODS

The aim of this study was to critically appraise the existing evidence evaluating osteoporosis' effects on dental implant osseointegration and survival rate. The inclusion criteria were clinical studies that evaluated the implant placement, complications, and osseointegration results in patients with osteoporosis; literature reviews and clinical studies addressing the outcome were considered; and articles written in English and published since 2000. Descriptive data analysis included author, year of publication, study design, number of patients, osteoporosis assessment, follow-up, and main findings. JBI quality assessment was performed. 24 articles were included with a total of 2,102 patients; 5954 dental implants were considered and evaluated.

### RESULTS

- All studies' survival rate was higher than 90%, even for osteoporotic patients. Most studies indicated no differences between osteoporotic and healthy patients regarding marginal bone loss (MBL), bone-to-implant contact, cytokine levels, and mineral bone density.
- A prospective cohort study found a small MBL (-0.34 mm) in osteoporotic female patients, but there was insufficient evidence to prove any causal relationship between MBL and osteoporosis.
- Another study showed no clinical differences between implants placed in osteoporotic and healthy individuals. In contrast, other studies showed lower stability scores for implants placed in osteoporotic sites and a higher risk of failure for implant placement.
- Osteoporosis status was not a risk factor for dental implant failure, which was also confirmed by histological studies. Three studies had a medium risk of bias and 21 a low risk.

### CONCLUSIONS

Osteoporosis is not a contraindication for dental implant placement. Osseointegration in patients with osteoporosis is feasible; however, planning must be cautious and personalized for the installation of dental implants

Adapted from Jamil A Shibli et al., Quintessence Int. 2025 Jan 13;0(0):0, for more info about this publication, click [HERE](#)

J Patient Rep Outcomes. 2025 Jan 14;9(1):7

## Patient-reported outcomes of zirconia dental implants: a systematic review and future directions

Behrouz Arefnia, Omid Fakheran, Norbert Jakse, Michael Payer



### STUDY OBJECTIVES AND METHODS

This systematic review evaluated the evidence on patient-reported outcome (PROs) in zirconia dental implant treatment. A systematic literature review was conducted following the PRISMA guidelines, utilizing six electronic databases, and supplemented by a manual search of relevant journals and websites to ensure a thorough and comprehensive screening process. The identified studies were subjected to preidentified inclusion criteria. Only controlled clinical trials published in English were considered without limitations on the year of publication. Data on the study characteristics (follow-up, survival rate (%), implant system, number of implants, and type of treatment), PROMs, level of evidence, and Methodological Index for Nonrandomized Studies (MINORS) Bias Score were extracted.

### RESULTS

- The initial database and hand search yielded 596 articles; 189 were included in the title and abstract screening after excluding the duplicates.
- Eighteen articles were selected based on the inclusion criteria, among which six were excluded because they did not match the research question. Thus, the final selection comprised 12 articles.
- Most PROMs (aesthetics, speaking, comfort, chewing ability, and general satisfaction) at prosthetic delivery revealed significantly improved average scores than those at pretreatment.

### CONCLUSIONS

Despite the respective limitations of the articles included in this systematic review, patients revealed high satisfaction levels with regard to zirconia dental implants. A high level of heterogeneity was observed among the instruments used for measuring the patient-reported outcomes in patients with zirconia implants, thus highlighting the need to develop specific PROMs in the future.

Adapted from B Arefnia et al., J Patient Rep Outcomes. 2025 Jan 14;9(1):7, for more info about this publication, click [HERE](#)

J Prosthodont. 2025 Jan 27

## Angulated titanium bases screw channel abutments for single implant restorations: A systematic review and meta-analysis

Paolo De Angelis, Edoardo Rella, Margherita Giorgia Liguori, Davide Piccirillo, Alberto Palmieri, Antonio D'addona, Paolo Francesco Manicone

### STUDY OBJECTIVES AND METHODS

The purpose of this systematic review was to examine available literature related to the effects of ASC abutments in rehabilitating single implant crowns. The meta-analysis used a fixed or a random effects model, based on the heterogeneity between the studies, focusing on binary and continuous data. A risk of bias assessment was performed (NOS or MOGA et al.) The outcomes assessed were peri-implant marginal bone level, probing pocket depth (PPD), the prevalence of technical and mechanical complications, implant and prosthesis survival rates, and esthetics. Statistical significance was set at  $p < 0.05$ .

### RESULTS

- The searches resulted in a total of 10 studies included in the meta-analysis.
- The mean implant and prosthesis survival rates were respectively 99% (absolute quantity = 243) and 100% (absolute quantity = 239) with non-statistically significant differences observed in single crowns supported by ASC abutments compared to cemented restorations, in terms of marginal bone loss (MBL) ( $p = 0.22$ ), PPD ( $p = 0.08$ ), risk of complications ( $p = 0.53$ ), and esthetics ( $p = 0.47$ ). Follow-up intervals ranged from 14 days to more than 3 years.

### CONCLUSIONS

Data based on this systematic review suggest that the clinical and radiographic outcomes of single implants restored using ASC are promising if compared to the outcomes relating to screw-retained single crowns.

Adapted from P De Angelis et al., J Patient Rep Outcomes. 2025 Jan 14;9(1):7, for more info about this publication, click [HERE](#)

## REFERENCES

V Nizampuram et al., J Long Term Eff Med Implants. 2025;35(1):45-49 | G Guzman et al., Case Rep Dent. 2024 Dec 3;2024:4199406 | MA Atieh et al., Int Dent J. 2025 Jan 25:S0020-6539(25)00009-7 | JA Shibli et al., Quintessence Int. 2025 Jan 13;0(0):0 | B Arefniaet et al., J Patient Rep Outcomes. 2025 Jan 14;9(1):7 | P De Angelis et al., J Patient Rep Outcomes. 2025 Jan 14;9(1):7 | source: [www.pubmed.gov](http://www.pubmed.gov) | Dr. Marcin Maj holds the position of Head of Global Scientific Affairs at Institute Straumann in Basel, Switzerland