Effect of Submerged vs Nonsubmerged Implant Placement Protocols on Implant Failure and Marginal Bone Loss: A Systematic Review and Meta-Analysis

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Purpose: To compare prosthesis and implant failures and marginal bone loss (MBL) resulting from submerged vs nonsubmerged dental implant protocols. *Materials and Methods:* Electronic and manual searches of two databases (MEDLINE [PubMed] and Cochrane) were conducted to identify randomized controlled trials (RCTs) comparing submerged to nonsubmerged dental implant protocols. Data were independently extracted by two reviewers, and meta-analyses were performed for the included RCTs. The Cochrane Risk of Bias tool was used to assess the quality of included studies. *Results:* Eight RCTs were identified, and six were included. Four of the included studies were considered to be at high risk of bias, one at unclear risk, and one at low risk. The meta-analysis for studies reporting MBL revealed significantly more bone loss around submerged implants (I^2 = 0%, *P* = .04; mean difference: 0.12; 95% confidence interval: 0.00, 0.24); however, there were no differences in implant or prosthesis failures between the two interventions. *Conclusion:* Two conclusions were made: *(1)* There were no differences between the two interventions regarding implant or prosthesis failures, and *(2)* submerged implants exhibited statistically significantly more MBL, but this difference was not clinically relevant. These conclusions should be interpreted with caution, since the present review is underpowered and the included RCTs were considered to be at high risk of bias. *Int J Prosthodont 2018;31:15–22. doi: 10.11607/ijp.5315*

Dental implants are now commonly used in the rehabilitation of totally and partially edentulous patients and are reported to offer favorable treatment outcomes.[1–3] The induced osseointegration process is characterized by an intimate interfacial contact between the bone and implant surface, which determines clinical success. Implant surface macro- and microgeometry, together with employed surgical and prosthodontic protocols, appear to determine successful treatment outcomes irrespective of whether a one- or two-stage surgical approach is used.[4,5] Several clinical studies[6–14] report favorable outcomes with both approaches, although concerns continue to be expressed that a one-stage protocol may increase the risk of implant failure.[15] Consequently, if bone augmentation is required during implant placement, the submerged technique seems preferable because it prevents overloading of the implants and secures an infection-free environment during the healing period.[16]

Nevertheless, more robust evidence is needed to determine whether a nonsubmerged implant provides the same satisfactory results over time. This would then encourage routine prescription of an equally efficacious but less expensive clinical protocol. The aim of this systematic review was to determine whether nonsubmerged implant protocols show similar outcomes in terms of prosthesis and implant failures and peri-implant marginal bone loss (MBL) when compared to submerged implant protocols.

Review Method

This systematic review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines.[17] The inclusion criteria were:

- Randomized controlled trials (RCTs), including parallel group and split-mouth designs
- Any subject receiving dental implants

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