CORRESPONDENCE

Value of platform switching on marginal peri-implant bone loss reduction: A summary review

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Summary

**Question:** Is there an impact of platform switching (PS) on marginal bone level changes MBL around endosseous implants compared to implants with platform-matching (PM) implant-abutment configurations?

**Data Sources:** PubMed, Web of Science, Journals at Ovid Full Text and Embase published between 2005 and June 2013. Besides manual search in the peer reviewed German-language Journal of Oral Implantology (Zeitschrift fur zahnarztliche Implantologie) or Implantologie (for both journals RCTs and PCCS were included).

**Study Selection:** Articles that published between 2005 and 2013 that reporting comparison of MBL changes at implants with PS or PM implant-abutment configurations as primary outcome were selected from electronic databases with language restriction was for English or German. RCTs with a follow-up period of at least 12 months were included in the meta-analysis.

**Data Extraction and Synthesis:** Data were extracted by 2 reviewers independently with high agreement between them. A search strategy was conducted using the MeSH and search term combinations, considering the PICO format. The quality assessment of RCTs is performed following the recommendations by Higgins and Green (2011). The difference of the assessment results was low, resulting in a κ score of 0.923 (disagreement in four of 105 fields) between the reviewers. Consent was reached by discussion.

**Results:** Regarding PCCS the total articles were 7 that were interpretate separately because of lacking of random allocation that revealing 3 studies with no significance between two group whereas 3 studies reveal significance difference between two group preferring PS (less MBL) and one study reveal a remarkable mean MBL in the PM group compared to the PS group. Whereas searching for RCTS resulting in a total of 13 that are eligible for inclusion into a meta-analysis that comprised a total of 549 patients receiving 1035 implants. Because of significant degree of heterogeneity ($I^2 = 96.2\%$, $P < 0.0001$) the treatment effects were assumed to be not homogeneous among the studies, and a random effects model for combining effects of all studies was applied. The meta-analysis result was reveal a significantly less mean MBL change (0.49 mm CI95% [0.38; 0.60]) at PS implants compared to PM implants (1.01 mm (CI95% 0.62; 1.40) $[P < 0.0001]$) on an implant-based analysis. Funnel-plot calculation showed no asymmetry ($P = 0.733$), and therefore, no publication bias.

**Conclusion:** Only two studies with a low risk of bias. All other studies revealed a tendency of a high risk of bias, resulting in an overall unclear and high risk of bias across studies. So, the author recommend for further research to overcome all these previous limitations and for providing more evidence research on the effect of PS on MBL.

Keywords

Meta-analysis, peri-implant marginal bone level, platform switching, systematic review

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Commentary

The amount of marginal bone loss (MBL) around dental implant is regarded as one of the very important criterion of implant success. It is usually measured by radiograph and biologically not more than 0.2 mm crestal bone loss is accepted annually after the 1st year. Since introduction of platform switching (PS) concept, there are many finite-element and in vivo studies on its effect on the MBL were conducted.1-5

However, most studies that aiming on the effect of PS on MBL compared to platform matching (PM) implant-abutment have relatively short follow-up periods and different sample sizes in addition to heterogeneity and possible publication bias, which led to different conclusions even in systematic reviews, ranging from not revealing any clinical superiority for any particular implant design in maintaining marginal bone levels to recognizing the PS technique as appearing useful in limiting bone resorption. So that long term, well-conducted RCT to validate effect of PS is conceded even in most recently publishing review.6-8

This systematic review was reported following the recommendations for preferred reporting items for systematic reviews and meta-analyses.9 The author state clearly all details for systematic review and meta-analysis studies including implant data (number, system, hex, level, loading, and follow-up period), patients demographic data and type of radiograph used for bone loss assessment. All figures and tables were systematically presented and explained, and there is no inconsistency between them and data in the text throughout the study.

For included RCT studies, critical appraisal focuses on the four general types of systematic error, which are selection bias, performance bias, attrition bias, and detection bias. Accordingly, most of the studies reveal a high degree of bias.

The result of this systematic review reveal the superiority of PS in reducing amount of MBL in comparison with PM especially the meta-analysis part of RCTS. However, the included studies for both RCTS and PCCS have high degree of heterogeneity; short follow-up periods and most of them have high to unclear risk of bias (different types) so that their results require cautious interpretation.

Therefore, up to date there is no strong evidence to answer the focused question, so the answer remains controversial. Consequently future research with combination of comparable studies, long observational period and more control of the possible confounders still strongly recommended.

Practice Point

The use of PS implant type could result in less MBL than PM type.

References
