

# Prevention and Management of Cheek and/or Tongue Biting Related to Posterior Implant-Supported Fixed Dental Prostheses (ISFDPs)

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## Keywords

Cheek; dental arch; dental occlusion; mastication; mouth mucosa; prosthodontics.

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## Abstract

After the loss of several adjacent posterior teeth, bone resorption occurs that can lead to a marked occlusal discrepancy between arches. This discrepancy may originate from the more pronounced resorption at the facial portion of the alveolar bone crest, often resulting in a more palatal implant position. Therefore, establishing normal overbite and cusp-fossa relation may become difficult, namely causing inappropriate crown contours and emergence profiles. This manuscript describes a technique in which a different occlusal configuration is given to solve some problems that edge-to-edge occlusal configuration produces. For instance, patients may suffer from cheek and/or tongue biting after the delivery of a maxillary posterior implant-supported fixed dental prosthesis resulting in an edge-to-edge occlusal configuration. In instances of severe maxillary resorption in the posterior buccal zone, it is recommended to consider a distinct cross-bite occlusion and by this prevent the well-known discomfort and clinical signs associated with both an edge-to-edge interarch relationship or a so-called “stretched” transversal overbite.

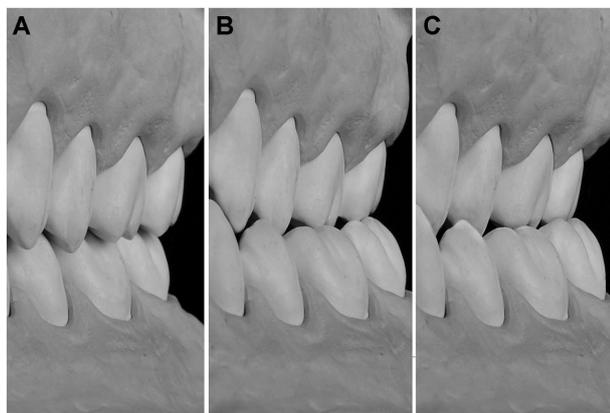
Jawbone resorption patterns must be considered for a successful implant-supported prosthesis fabrication, since the substituting teeth should be present at a position to the natural teeth; however, this is not always possible, especially when severe bone resorption is present and guided bone regeneration (GBR) is not a feasible option due to patient-related factors. When a tooth is lost, the lack of mechanical stimuli and other elements can affect the bone architecture leading to atrophy.<sup>1</sup> Based on the Glossary of Prosthodontic Terms (2017),<sup>2</sup> bone atrophy is defined as “bone resorption noted internally by a decrease in density and externally by a reduction in dimension.” The pattern of bone loss varies within arches.<sup>3-6</sup> Typically, the posterior maxilla suffers vertical and buccal horizontal resorption.<sup>7</sup> For instance, when after insertion of a new implant-supported posterior fixed dental prosthesis (FDP) cheek/tongue biting occurs, the main cause is usually the prosthesis, as the optimal normal transversal overbite and occlusal cusp-fossa relationship cannot always be achieved, leading to an occlusal interarch-relation discrepancy.

The following technique introduces the steps to follow when a provisional or definitive implant-supported maxillary poste-

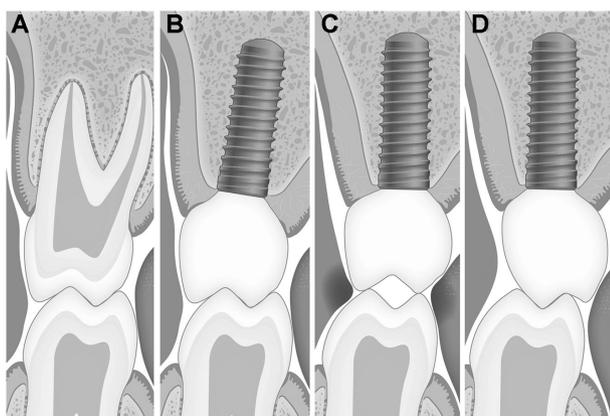
rior FDP has been recently placed and causes single or multiple cheek and/or tongue traumatic lesions.

## Technique

1. Carefully assess the static and dynamic dental occlusion with articulating paper and smoothen rough or sharp edges.<sup>8,9</sup> Patient feedback might be biased, since the mucosa lesion may be highly sensitive. Explain the problem to the patient (counseling) and thereby create awareness that may help to trigger specific compliance. Sometimes behavioral change alone will solve the problem.
2. If the cheek and/or tongue biting remains unresolved after 1 to 2 weeks, remove the prosthesis to cease the mucosal trauma. In case of a provisional FDP, place a healing cap on each implant to maintain marginal soft tissue support, and re-install the previous removable restoration. Send the provisional implant FDP back to the dental laboratory with clear instructions for modification, such as the creation of either a marked normal transverse overbite or a distinct cross-bite. In case of a definitive implant FDP, remove it and replace it with the previously worn



**Figure 1** Fronto-buccal view of posterior left teeth in centric occlusion. (A), ideal occlusion. (B), edge-to-edge occlusion. (C), cross-bite occlusion.



**Figure 2** Longitudinal view of the typical interarch configurations of posterior teeth/implant restorations and adjacent soft tissues (left first molar). (A) Natural teeth with ideal intercuspation. (B) Re-establishment of the ideal occlusion in case of an optimally positioned maxillary implant. (C) Edge-to-edge cusp relation with an increased risk for cheek and/or tongue biting due to a more palatally located implant. (D) Cross-bite. Note how the distinct transverse overbite orally and facially holds the soft tissue at distance of the occlusal surface.

provisional FDP, which had produced no harm. Thoroughly examine the pertinent design features of the latter, and take an alginate impression of the well-designed temporary FDP to be used as a guide for the laboratory.

3. Instruct the dental technician to avoid the transversal edge-to-edge interarch relation for the fabrication of the definitive restoration. When possible, an ideal cusp-fossa relation to the antagonist, including a distinct transverse overbite, should be achieved (Figs 1A, 2B). In instances of a severe mismatch between opposing arches (i.e., narrower maxillary arch), promote a cross-bite occlusion (Fig 2D).

## Discussion

When an optimal occlusion is not achievable due to severe interarch misalignment resulting from the bone atrophy pattern

where the maxillary arch is considerably narrower in comparison to the mandibular arch, a GBR approach could be considered a substitute for the buccal missing bone structure; however, this approach is not always feasible, especially when the GBR approach is compromised by patient-related factors such as fear of additional surgery, financial limitations, medically compromised status, or high degree of bone resorption.<sup>10-13</sup> Therefore, an edge-to-edge cusp relation is frequently used by dental technicians as an esthetically driven “compromise” solution (Fig 2C).<sup>14</sup> Conversely, this design configuration is one of the main causes for cheek and/or tongue biting. Remarkably, there is limited literature available addressing this problem.<sup>15-17</sup> A cross-bite solution with its inherent transversal overbite of opposing cusps does not only reduce the risk for biting the adjacent mucosal tissues but also avoids an overcontoured fixed restoration that in turn would promote plaque accumulation and potentially lead to peri-implant diseases (Fig 2D).

Acute and chronic oral lesions are frequently developed after oral mucosal biting/chewing, known as morsicatio buccarum.<sup>18</sup> This interferes with subjective patient comfort and can be especially painful when the lateral border of the tongue is involved, known as morsicatio linguarum.<sup>19</sup> There have been attempts to prevent and manage oral mucosa trauma. Such attempts include reconditioning the patient to avoid parafunctional behavior or targeting the habit, protection of mucosa from injury by oral appliances,<sup>20,21</sup> and selective occlusal grinding,<sup>22</sup> especially of sharp cusp edges. Hence, clinicians may implement other prosthetic design configurations such as transversal edge-to-edge occlusion (Fig 1B) or cross-bite (Fig 1C), both also encountered in nature, to compensate for interarch discrepancies.<sup>23</sup>

## Conclusion

When patients suffer from cheek and/or tongue biting after the delivery of a maxillary posterior implant-supported fixed dental prosthesis, it is recommended to consider a distinct cross-bite occlusion and by this prevent the well-known discomfort and clinical signs associated with both an edge-to-edge interarch relationship or a so-called “stretched” transversal overbite.

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