

## Consensus Statements and Recommended Clinical Procedures Regarding Esthetics in Implant Dentistry

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### INTRODUCTORY REMARKS

The group was asked to come to a consensus position related to the esthetic dimension of implant dentistry in the anterior maxilla, based on its discussion of and subsequent deliberation on 3 previously written position papers regarding the following fields: (1) outcome analysis of implant restorations located in the anterior maxilla; (2) anatomical and surgical considerations of implant therapy in the anterior maxilla; and (3) practical prosthodontic procedures related to anterior maxillary fixed implant restorations. These reports were critically reviewed and thoroughly discussed within the group, leading to a first draft of consensus statements. These were subsequently presented during a plenary session that included the members of the other 3 consensus groups. After their respective input, the statements were refined and then presented again to the plenary session for final approval.

### CONSENSUS STATEMENTS AND CLINICAL RECOMMENDATIONS

In esthetic dentistry, difficulties arise in generating evidence-based statements regarding clinical procedures. Therefore, any clinical recommendations given in this section are primarily based on the expert opinion of this group. The group worked on each statement until a unanimous opinion was reached.

#### Long-Term Results

From the discussion of the Belser et al review of long-term results of implant treatment in the esthetic zone, the following consensus statements were drafted.

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*Evidence from the Literature.* The use of dental implants in the esthetic zone is well documented in the literature. Numerous controlled clinical trials show that the respective overall implant survival and success rates are similar to those reported for other segments of the jaws. However, most of these studies do not include well-defined esthetic parameters.

*Single-Tooth Replacement.* For anterior single-tooth replacement in sites without tissue deficiencies, predictable treatment outcomes, including esthetics, can be achieved because tissue support is provided by adjacent teeth.

*Multiple-Tooth Replacement.* The replacement of multiple adjacent missing teeth in the anterior maxilla with fixed implant restorations is poorly documented. In this context, esthetic restoration is not predictable, particularly regarding the contours of the interimplant soft tissue.

*Newer Surgical Approaches.* Currently, the literature regarding esthetic outcomes is inconclusive for the routine implementation of certain surgical approaches, such as flapless surgery and immediate or delayed implant placement with or without immediate loading in the anterior maxilla.

#### Surgical Considerations

From the discussion of the Buser et al review of surgical considerations of implant treatment in the esthetic zone, the following consensus statements were drafted.

*Planning and Execution.* Implant therapy in the anterior maxilla is considered an advanced or complex procedure and requires comprehensive preoperative planning and precise surgical execution based on a restoration-driven approach.

*Patient Selection.* Appropriate patient selection is essential in achieving esthetic treatment outcomes. Treatment of high-risk patients identified through site analysis and a general risk assessment (medical status, periodontal susceptibility, smoking, and other risks) should be undertaken with caution, since esthetic results are less consistent.

*Implant Selection.* Implant type and size should be based on site anatomy and the planned restoration. Inappropriate choice of implant body and shoulder dimensions may result in hard and/or soft tissue complications.

*Implant Positioning.* Correct 3-dimensional implant placement is essential for an esthetic treatment outcome. Respect of the comfort zones in these dimensions results in an implant shoulder located in an ideal position, allowing for an esthetic implant restoration with stable, long-term peri-implant tissue support.

*Soft Tissue Stability.* For long-term esthetic soft tissue stability, sufficient horizontal and vertical bone volume is essential. When deficiencies exist, appropriate hard and/or soft tissue augmentation procedures are required. Currently, vertical bone deficiencies are a challenge to correct and often lead to esthetic shortcomings. To optimize soft tissue volume, complete or partial coverage of the healing cap/implant is recommended in the anterior maxilla. In certain situations a nonsubmerged approach can be considered.

### **Prosthodontic and Restorative Procedures**

From the discussion of the Higginbottom et al review of prosthodontic and restorative procedures for implant treatment in the esthetic zone, the following consensus statements were drafted.

*Standards for an Esthetic Fixed Implant Restoration.* An esthetic implant prosthesis was defined as one that is in harmony with the perioral facial structures of the patient. The esthetic peri-implant tissues, including health, height, volume, color, and contours, must be in harmony with the healthy sur-

rounding dentition. The restoration should imitate the natural appearance of the missing dental unit(s) in color, form, texture, size, and optical properties.

*Definition of the Esthetic Zone.* Objectively, the esthetic zone was defined as any dentoalveolar segment that is visible upon full smile. Subjectively, the esthetic zone can be defined as any dentoalveolar area of esthetic importance to the patient.

*Measurement of Esthetic Outcomes.* The following esthetic-related soft tissue parameters are proposed for use in clinical studies:

- Location of the midfacial mucosal implant margin in relation to the incisal edge or implant shoulder
- Distance between the tip of the papilla and the most apical interproximal contact
- Width of the facial keratinized mucosa
- Assessment of mucosal conditions (eg, modified Gingival Index, bleeding on probing)
- Subjective measures of esthetic outcomes, such as visual analog scales

*Use of Provisional Restorations.* To optimize esthetic treatment outcomes, the use of provisional restorations with adequate emergence profiles is recommended to guide and shape the peri-implant tissue prior to definitive restoration.

*Location of the Implant Shoulder.* In most esthetic areas, the implant shoulder is located subgingivally, resulting in a deep interproximal margin. This shoulder location makes seating of the restoration and removal of cement difficult. Therefore a screw-retained abutment/restoration interface is advisable to minimize these difficulties.