Prosthetic rehabilitation of maxillary anterior region using implant supported restoration - A case report

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Abstract

Achieving an aesthetic implant-supported restoration in the anterior region can be a challenging task. The treatment planning for an implant restoration is unique regarding the number of variables that may influence the therapy. Collection of patient’s information, appropriate abutment selection, soft tissue contour, implant axis, and occlusion need to be collectively emphasized for aesthetic clinical outcome. This case report describes the successful prosthetic rehabilitation of maxillary anterior region in a patient using implant supported restoration.

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Figure 1. Clinical photograph after surgical placement of implants

Figure 2. Radiographic assessment showing satisfactory integration of implants

Figure 3. Impression copings placed

Figure 4. Elastomeric impression made to capture the position of implants

Figure 5. Abutments placed

Figure 6. Radiographic confirmation of abutment seating

Figure 7. Porcelain fused to metal crowns cemented

Figure 8. Comparison of pre-operative and post-operative photograph
Periodontium type

Ochsenbein and Ross in 1969 [9] classified the periodontium into a thick flat type and a thin scalloped type. Each type was said to have different inflammatory responses to external stimuli and to periodontal treatments. In 1997, Weisgold applied the idea to implantation [10]. The patient in this case report had a thin scalloped type periodontium, which is susceptible to external stimuli and causes gingival recession. In an effort to prevent such recession, extra attention was paid in the course of constructing a restoration, like proper retraction of the marginal gingiva before making an impression.

Submergence profile

It is a vertical discrepancy between the fixture head and its adjacent cementoenamel junction. It is a vertical space necessary for a round implant with a short diameter to transform into a triangular crown cervical with a long diameter. It is also an index of guided gingival growth during a provisional phase. The submergence profile of 1-3 mm enables an optimal adjustment of the gingiva, and the profile of 4-5 mm promises a relatively fine adjustment, but that of over 5 mm makes an adjustment difficult. In order to prevent it, a surgical stent that can adjust not only the direction but also the depth of an implant fixture needs to be constructed.

Gingival contour

Peri-implant soft tissue is just like a toy balloon with water inside that can expand in any direction. Thus, an individualized healing abutment can change a form of the marginal gingival [11]

Apicocoronal position

It is closely related to the diameter of an implant and essential to an aesthetic emergence profile [12]. When the diameter of an implant is similar to that of an extracted tooth’s cervical area, the distance of 3-4 mm is required for an aesthetic reason between a free gingival margin and implant shoulders to recover biologic width and peri-implant sulcus. Thus, the part where the abutment and the gingiva meet were made from biocompatible porcelain to maintain oral hygiene.

Long axis

The long axis of an implant determines the dimension of a crown. If a fixture is implanted in parallel with the long axis of a crown restoration, the height of a crown and a natural tooth will be the same. However, if an implant is inclined to the palatal, a restoration with a form of ridge lap will be created on the facial surface, making it hard to maintain oral hygiene [13]. In the process of implantation, a fixture tends to incline to the facial bone softer than the palatal bone. This can be prevented by blocking the labial side when a surgical stent is constructed.

Occlusion

An implant fixture does not have periodontal ligament and the surface of the root is only 145 mm² as compared to 204 mm² of the central incisor and 179 mm² of the lateral incisor [14]. It is important to consider this during an occlusal adjustment. In this case, the patient's four anterior teeth had minimal contact during maximum intercusption and no contact for protrusive & laterotrusive movement.

Thickness of marginal gingiva

The marginal gingiva should be thick on the facial surface to prevent the appearance of metal and minimize inflammatory reaction.

Conclusion

Placement of dental implants in the maxillary anterior region requires precise planning & surgery and demands a thorough understanding of the anatomic, biologic, surgical and prosthetic principles. The present report describes the successful prosthetic rehabilitation of maxillary anterior region in a patient using implant-supported restoration.

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