The Advantage of Different Cuff Heights in Implant Supported Fixed Prosthesis
“A Case Report”

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Farklı Transgingival Parça Yükseklüğünün Avantajları: Olgu Raporu

Purpose: The objective is to select an abutment that allows the margin between the artificial tooth and the titanium abutment cylinder to be placed at least 3 mm below the gingival margin when the mucosa has healed completely.

Case Report: A 58-year- old man suffering the absence of teeth on the right posterior maxillary region desired a fixed prosthesis in the maxilla. Two 10mm - 3.75mm Calcitek spline implants (Calsbad, Calif) were inserted in the upper right posterior maxilla. However, as the maxillary bone has a poor cancellous density, the surgical technique leave abutment in a less than an ideal position.

The objective is to select an abutment that allows the margin between the artificial tooth and the titanium abutment cylinder to be placed at least 1 to 2 mm below the gingival margin when the mucosa has healed completely.

For esthetic purposes a gingival cuff (5mm) which has a high servico-incisal height was selected to compensate the fixture that was to submerged 3 mm below the mucosal level. The posterior framework was then designed and fabricated.

Result: During the first and third clinical year of stress the crestal bone was evaluated whether there was a bone loss or not. However it seems that the bicortical anchorage of the posterior maxillar fixtures appears best for a successful long-term prognosis.

Keywords
Dental implant, Fixed partial denture, Gingival margin

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The treatment of patients with endosseous dental implant supported restorations has become a popular restorative option because of predictable implant survival, prosthesis retrievability, and conservation of natural tooth structure. The success of an implant supported prosthesis depends upon prudent diagnosis and treatment planning followed by the performance of technically difficult clinical procedures. Several factors have been suggested for the evaluation of implant success.

Stable rigid fixed implants have been reported to have pocket depths of 2 to 6 mm. Partially edentulous patients have consistently greater probing depths around implants than around teeth. Therefore, the tissue thickness and implant sulcus depth should be reduced to an ideal 3 mm or less sulcular depth when esthetics are not a primary concern. Various cuff height options, as low as 0.5 mm, aid in cases of limited vertical height and tissue depth. However, as the maxillary bone has a poor cancellous density during the surgery, the fixtures may submerge more than desired depth.

The aim of this case report was to present the possibility for apical-coronal implant positioning: the submerged implant placed with the collar in a supracrestal position.

CASE PRESENTATION

A 58-year-old man applied to our clinic with the absence of teeth on the right posterior maxillary region. He desired a fixed prosthesis in the maxilla. He has no systemic problems also non smoker and his oral hygiene was excellent. Records collected included a medical history, periodontal assessment, diagnostic casts and both periapical and panoramic x-rays.

A dental screening with panoramic view was conducted to determine the status of bone and implant selection. The treatment plan included the placement of 2 endosseous implants to restore the area with an implant-supported fixed partial denture. Implant surgery was carried out as a two-stage protocol. The surgery was done under the local anesthesia; paracrestal incision was made on the palatal aspect of the edentulous site, and the necessary vertical incisions extended buccally so as to preserve the interproximal papillae. Then a full-thickness flap was elevated buccally sufficiently to visualize the alveolar ridge anatomy. During the operation, the maxillary sinus membrane was slightly elevated to allow the implant placement and two HA-Coated Spline Dental Implants (Sulzer Calcitek Inc.) (3.75 mm & 4.0 mm / 5.5 mm, 5 mm cuff, 3.75 mm & 4.0 mm / 5.5 mm, 3 mm cuff) were selected. Once site preparation was completed and following saline irrigation, the implants were placed and driven to its final fully seated position.

The properly placed implant was fully submerged in bone with little more than the healing cap above the bony crest. However because of the unfavorable bone quality in the edentulous gap during the surgery, the fixture which was inserted in the second molar region was submerged more than desired and planned position at the beginning of the treatment. As a result, the surgical approach left abutment in a less than ideal position (Fig 1, 2).

After healing period of about 6 months, the patient was recalled for the second step surgery. A small incision was made over each implant and the soft tissue reflected sufficiently to permit removal of the healing cap. Any bone growth on the covers is removed from around the implant. The implant surface should not be scratched or contaminated during this period. A temporary gingival cuff (3.75 x 5.5 mm) was attached to the implant and the gingival tissue growth was removed.

\[ \text{FIGURE 1} \]

Panoramic x-ray after placement of the implants
was sutured tightly around it. The patient was instructed in appropriate hygiene technique and asked to apply topical chlorhexidine around the implant periphery with a single-tooth brush or cotton swab at least three times daily. The sutures were removed after 7 days and soft tissues were allowed to heal for at least 1 month before prosthodontic procedures were begun.

The first prosthetic appointment takes place when the mucosa has healed almost completely. The thickness of the mucosa from the gingival margin to head of fixtures measured after the healing cap has been removed. For aesthetic purposes a 5mm gingival cuff which has a high servico-incisal height was selected to compensate the fixture that was to be submerged 3 mm below the mucosal level to ensure a supragingival margin of the crown. To the first implant a gingival 3 mm cuff was selected. The indirect implant abutment analogs were placed into preliminary impression which was poured with dental stone. A three unit transitional prosthesis was fabricated to the patient.

Implant-supported three-unit bridge was constructed. The porcelain fused to metal fixed bridge was seated passively cemented onto the abutments. The occlusion was adjusted, using shimstock as the final check and occlusal contacts on the implant prosthesis and adjacent teeth were verified (Fig 3). The periapical and panoramic x-rays were taken to confirm the fit of the restoration on the fixture (Fig 4).
DISCUSSION

After one year the patient was recalled and radiographic and clinical controls were repeated. During the first clinical year of stress the crestal bone was evaluated whether there was a bone loss or not. This procedure was repeated at the third year of control. It seems that the bicortical anchorage of the posterior maxillary fixtures appears best for a successful long-term prognosis.

In the maxillary posterior region, the thickness of mucosa increases as one gets closer to the tuber maxilla. During the determination of the abutment-crown margin, the increasing thickness of mucosa plays an important role. Cleaning of the deep pocket cased by the thick mucosa and passing of the deep gum pocket with polished abutment surface to keep it healthy is only possible with high cuff. The plaque build-up on the polished abutment surface will be minimized thanks to lower retention area. The joint between the high cuff and the abutment crown can be seen clearly during the restoration process.

Because of the low reachability of the posterior region, cleaning the restorations in this region is difficult. Changes first in the gingiva and later on in the tooth-implant surrounding bone tissue supporting the restoration are probable. Clean ability can be increased in regions that can’t be reached easily and where esthetics are not a concern by moving the abutment-crown margin from the gum border to the coronal. In the posterior regions where esthetics aren’t very important, taking these preventive measures in order to protect the restoration is important for prognosis.

Even our follow-up period is not enough to emphasize a successful result, it seems that the bicortical anchorage of the posterior maxillar fixtures appears best for a successful long-term prognosis.

REFERENCES


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