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Case Report

Prosthetic rehabilitation of the anterior esthetic zone with implant supported FDP and Laminate veneer: A case report

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ABSTRACT

Prosthetic rehabilitation of the anterior aesthetic zone is one of the most challenging enigmas for the dental practitioners. It is extremely important to re-establish the function and aesthetics of this region well due to the visibility and smile performance. Patient's age, socioeconomic status and mental integrity plays a very important role in these cases. Dental implants are widely accepted as a reliable treatment option for replacing anterior teeth. The clinician must consider the angulation of the implant placement, the time needed for implant integration and soft-tissue healing, creation of emergence profiles, occlusal forces in relationship to progressive loading, and occlusal forces on the final restoration through a well formulated treatment plan. This case report focuses on the rehabilitation of a missing central incisor along with closure of unaesthetic diastema using an implant supported crown and a porcelain laminate veneer.

INTRODUCTION

Dental professionals have always been searching for natural looking as well as long lasting restorations. Prosthetic rehabilitation of the anterior aesthetic zone is one of the most challenging enigmas for the dental practitioners. It is extremely important to re-establish the function and aesthetics as the clinician rehabilitate the lost tissues because of the region's visibility and smile performance Dental implants are the most popular and reliable treatment option for replacing the missing dentition whether it is involving a single unit or the complete edentulism. The proper treatment planning along with carrying out the correct surgical protocol is the essence of achieving the ideal esthetic result. The clinician must consider the angulation of the implant placement, the time needed for implant integration and soft-tissue healing, creation of emergence profiles, occlusal forces in relationship to progressive loading, and occlusal forces on the final restoration.

Porcelain veneers are to be considered the "state of the art" in esthetic dentistry. Newer bonding techniques and porcelain veneers offer a variety of treatment options which became a remedy for the esthetic dilemmas. They are excellent in terms of esthetics, durability and the tooth preparations needed for the veneers are almost negligible, which does not disturb the soft tissue or the periodontium, an advantage over full coverage FDPs. When it was proven that function and esthetics could be

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achieved with porcelain laminate veneers and without the removal of large amounts of intact tooth structure, porcelain veneers became the restorative material of choice in addressing the most challenging aspects of esthetic dentistry by integrating the individual restorations into the adjacent natural dentition.[1]

Major shortcomings of the porcelain veneer system were described as a relatively large marginal discrepancy, and an insufficient wear resistance of the luting composite [2].

This article reports a case of single missing tooth and the prosthetic rehabilitation of the same with implant supported crown and esthetic correction of the existed diastema with porcelain laminate veneer.

CLINICAL REPORT

A 25-year old male patient came to the Department of Prosthodontics at Army College of Dental Sciences, with the chief complaint of missing upper front tooth and difficulty in interacting with peers due to esthetic concerns. The patient demanded a permanent solution and wanted to replace his missing tooth with a fixed restoration.

Patient gave a history of trauma followed by loss of left maxillary central incisor and replacement with a removable partial denture at the age of 12.

An extensive intra oral examination showed missing 21 (Fig.1, Fig.2, Fig.3) and the periodontal condition was good and oral hygiene was well maintained. He was evaluated medically, radiographically (OPG and CBCT) to assess the current health status and to rule out any underlying pathologies and to evaluate the quality of the bone. The patient was explained about all the treatment options available and finalized with implant placement followed by prosthetic rehabilitation

Fig. 1: Pre-operative frontal view

Fig. 2: Frontal View- Missing 21

Fig. 3: Occlusal View

Fig. 4: ADIN 15-degree abutment in place w.r.t 21 and the incisal lapping design w.r.t 22

Fig. 5: Intra oral view-Final restoration

Fig. 6: Post-operative frontal view

a) Surgical Phase

The CBCT showed an average bone width of 6 mm and bone height of 13 mm in the missing 21 region. The proper treatment planning with correct surgical protocol was done. A written consent was taken from the patient prior to the surgical procedure. An endo-osseous implant of 3.75 mm x 11mm (ADIN Touareg Implant) was selected. Following the administration of local anesthesia (2% lidocaine) an incision was made and full thickness flap was raised.

Pilot drilling followed by ostectomy was done with the help of a surgical guide template and the implant was placed and torqued using a calibrated ratchet. The final torque value recorded was 40N. The cover screw was placed, flap was sutured back and a cold pack was given. Post-operative instructions were explained. Medications along with 0.2% Chlorhexidine mouthwash were prescribed and post-operative OPG and IOPA radiographs were taken. The patient was recalled after 7 days for suture removal and the healing was evaluated.

b) Prosthetic Phase

After 3 months second stage surgery was done and healing cap was placed (ADIN). Emergence profile was checked after 2 weeks. The mesio-distal distance of the missing space was slightly excess to compensate only with the implant supported crown and expected an aesthetic failure. The patient was informed and the incisal lapping design with an equigingival finish line was prepared on the left lateral incisor for porcelain veneer (Fig 4). A 15-degree ADIN abutment was selected, the seating of the abutment was checked and torqued with a ratchet (Fig 4). The occlusal clearance of the abutment was checked and a close tray impression was made using poly vinyl siloxane impression material (Aquasil, DENTSPLY, Germany).

After 4 days, the final restorations were fabricated (Fig.5). The proximal contacts and the occlusion were checked and the implant supported crown w.r.t 21 was then cemented using zinc oxide eugenol temporary

cement for easy retrieval in the future. The universal bonding protocol was followed for the cementation of laminate w.r.t 22. Post cementation oral hygiene instructions were given and advised recall after 3 months. The patient was happy with the aesthetics as well as the functional outcome which boosted his self-confidence. (Fig.6)

DISCUSSION

The case report mainly focused on the importance of aesthetics during prosthetic rehabilitation in the anterior maxillary region. It is inevitable to consider the patient's age and socio-economic status along with the clinical considerations during the treatment planning. Implant supported FDPs have certain benefits over conventional FDPs including residual bone maintenance, non-involvement of adjacent teeth, and long-term success rate if the oral hygiene is well maintained. Only for reasons of anatomical structures or patient-centered preferences and as a second option should cantilever tooth-supported FDPs or FDPs supported by combination of implants and teeth be chosen [3] .Successful implant treatment to replace missing teeth in the anterior maxilla requires the knowledge regarding the implant angulation, surgical procedures, prosthetic phase and a mental image of the final restoration prior to the initiation of treatment. The papilla level around single-tooth implants in the anterior maxilla is mainly influenced by the interproximal bone crest level of the adjacent tooth. Facial marginal mucosal level, on the other hand, is affected by multiple factors including the peri-implant biotype, the facial bone crest level, the implant fixture angle, the interproximal bone crest level, the depth of implant platform, and the level of first bone to implant contact [4]. Unless the position of the final prosthesis is visualized prior to surgery, the placement of the dental implants may not allow the desired end result to be achieved [5].

The other treatment modalities suggested to the patient were conventional fixed partial dentures, and resin bonded restoration. Removable prosthesis was not given as an option due to patient's age and prior experience. The conventional FDP is ruled out due to unnecessary tooth destruction and chances of dentinal sensitivity in the future. The resin bonded restorations cause less abutment destruction, but has high chances of pontic failure and debonding so considered the implant supported crown with an adjacent laminate veneer as the best treatment option.

SUMMARY

The implant placement in the anterior maxillary region to replace missing teeth requires precise planning, surgical expertise and prosthetic skills. To optimize soft tissue levels around single implants, clinicians should limit papilla-opening procedures and pay utmost attention to a correct implant and contact point positioning [6]. The placement of the implant and the image of the final restoration prior to the treatment is extremely important for a successful rehabilitation of the smile zone. In this case report along with the surgical phase, we had given equal or more importance to the esthetic concern of the patient by masking the bony defect using gingival porcelain to avoid extensive waiting period after periodontal surgery and closure of the diastema with porcelain laminate veneers.

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