

Single Implant Restoration in a Reduced Crown Space Situation: A Case Report

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Abstract

Clinicians are routinely faced with the need to restore a single tooth in an otherwise non restored dentition. Traumatic incidents, caries and congenitally missing teeth are common etiologies. In these situations, the treatment options include a traditional fixed partial denture, a resin bonded restoration and a single-tooth implant. Although each is a viable treatment alternative, the implant restoration has definite advantages. It has become an esthetic, functional restoration with long-term predictability and it is the ideal treatment for a single-tooth replacement in a pristine dentition. This case report shows rehabilitation of single tooth with reduced space available from endosteal implant.

Keywords: endosteal implant, fixed partial denture, resin bonded restoration.

Introduction

Implants have been used to support dental prostheses for many decades, but they have not always enjoyed a favourable reputation. This situation has changed dramatically with the development of endosseous osseointegrated dental implants. They are the nearest equivalent replacement to the natural tooth, and are therefore a useful addition in the management of patients who have missing teeth because of disease, trauma or developmental anomalies.¹ Implants offer significant advantages over resin-bonded or conventional bridges. They prevent the needless restoration of sound teeth adjacent to the edentulous area as would be required for a fixed partial denture. In instances where the adjacent teeth have no restorations, a single-tooth implant provides the opportunity to preserve the integrity of the existing teeth.² Clinicians may use prognostic indicators associated with natural teeth and apply them to potential

implant sites or existing implant-supported crowns.³ The high success and survival rates reported for various implant systems using the protocol for single tooth replacement meant that the two-stage submerged procedure is considered the standard of care for oral implants.⁴ The first rationale of placing a single dental implant includes prevention of the needless restoration of sound teeth adjacent to the edentulous area as would be required for a fixed partial denture. It also avoids the pulpal, periodontal, and endodontic complications of the supporting abutments associated with the fixed dental prosthesis. By replacing the tooth root with implants, it becomes the anchor in the bone and the supports the clinical crown, providing stimulation, and thus preservation of the surrounding bone.⁵ The following case report also shows the procedure to rehabilitate a missing mandibular premolar with reduced available crown space with endosteal implant.

Methodology

21 year old female patient named Nikita reported to Department of Prosthodontics seeking options for replacement of missing 45. Detailed case history was undertaken which showed that patient had got 45 extracted 2 years ago as it was grossly decayed and available treatment option was explained to the patient in which patient choose to go for implant restoration. OPG was advised and diagnostic cast was fabricated in which it was found that the available space for the crown portion was less in the 45 region due to drifting of 44 and 46 in the long standing available space.



Fig 1: Opg –Missing Irt 45 Region

To gain additional space for crown structure proximal slicing was done on the distal side of 43 and mesial side of 46, once satisfied with the available space implant restoration was planned using CBCT.



Fig. 2: Proximal Slicing Done Irt 46 Region To Gain Adequate Mesio-Distal Space

Implant dimension chosen was 3.5× 10mm as the buccal plate was slightly resorbed as well. Initial drilling was done and ridge splitting was done to gain additional width, which was followed by sequential drilling and placing the implant.



Fig. 3: Implant Placement Of Dimension 3.5× 10 Mm After Ridge Spilt Bio oss bone grafting was done on the resorbed buccal bone which was stabilized with bone tags. (fig 4)

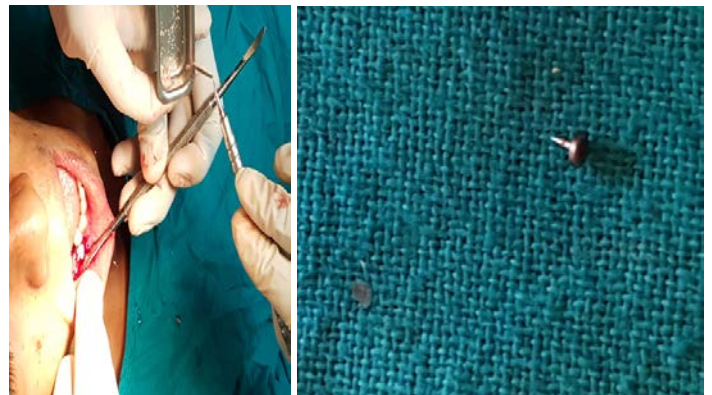


Fig 4: Grafting Done And Secured With Bone Tags.

Implant was left to osseointegrate and provisionalisation was done to maintain the prosthetic space. (fig 5)



Fig 5: Temporary Fixed Space Maintainer

Second stage surgery was performed after 3 months in which flap was reflected to remove the placed bone tag and healing abutment was placed, and left for one week for the gingiva to shape.



Fig 6: Second Stage Surgery, Removing the Titanium Bone Tags and Healing Abutment Placement Suitable prosthetic abutment was chosen and additionally trimmed to gain more space for ceramic and abutment level impression was made and final crown cemented.



Fig 7: Abutment Trimmed To Gain Prosthetic Space

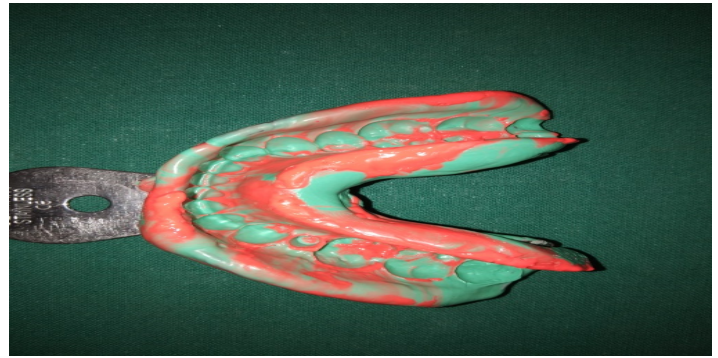


Fig 8: Abutment Level Wax Impression



Fig 9: Final Prosthesis Cemented

Discussion

Since the early 1980s, the use of osseointegrated implants has become a well-established and predictable treatment. Initially, oral implants were used in the completely edentulous situation. Later, a high degree of success was achieved with implants in partly edentulous jaws. The single-tooth implant has also become a predictable treatment option.² The tremendous advantage of the single-tooth implant lies in the fact that the adjacent teeth are not prepared. These teeth are left in their current state of health and are not linked as part of a larger restoration. The adjacent teeth have a better prognosis, as they are not subject to a higher incidence of endodontic therapy and decay as a result of tooth preparation.² Single-tooth replacement may be effected through use of a resin-bonded fixed partial denture (RBB), a conventional fixed dental prosthesis (FDP), a removable prosthesis, or a single implant-supported crown (SIC). Each option has its own advantages and disadvantages. FDP offers the

advantage of clinical ease, reduced treatment time, and also can meet the esthetic, functional requirements and the patient comfort. A major shortcoming of fixed dental prosthesis is the need for abutment preparation and subgingival margins in esthetic situations, which can be associated with increased gingival inflammation. In addition, a three unit fixed dental prosthesis presents a survival limitations to the restoration and the abutment teeth. The success rate for replacement of a molar or premolar with a dental implant restoration has been shown to be greater than 95%. Many clinicians feel that, due to the substantial success rate, implants should be considered as the definitive choice over other tooth - replacement alternatives.⁵ The implant mimics the root of a tooth in function. It is not only biocompatible, but actually fuses to bone by osseointegration.⁶ The key factor in implant osseointegration is surface roughness, which shows increased osteoblast activity at 1 to 100 µm of the surface roughness compared to a smooth surface. It is believed that rough surfaces have better osseointegration than smooth surfaces, but the results of the research have been diverse and it is not clear that multiple treatments provide better predictive results.⁷ While the geometric design of an implant contributes to mechanical stability, the nature of the implant surface itself is also critically important to the osseointegration rate of dental implants.⁸ The following case history describe the condition of reduced prosthetic space along with buccal bone resorption ,which was tackled with proximal slicing, ridge splitting and bone graft, which was followed by abutment level impression and cement retained prosthesis.

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