

Prosthetic Management of An Edentulous Space With A Single Implant Supported Crown: A Case Report

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Introduction

The most common choice to replace posterior missing teeth is a fixed partial denture (FPD)¹. The adjacent teeth next to the missing tooth are prepared, and crowns are inserted that are connected to the missing tooth (pontic)².

But in present time, primary treatment option to replace a posterior single missing tooth is a single-tooth implant. The primary reasons for suggesting the FPD were its clinical ease, reduced cost, and reduced treatment time.² The primary reason to suggest or perform a treatment should not be related to treatment time, costs, or difficulty of the procedure but instead should consider the best possible long-term solution for each individual.²

When adjacent teeth are healthy or when the patient refuses their preparation for the fabrication of a traditional three-unit fixed partial restoration, a posterior single-tooth implant is an excellent solution. Health-related advantages of implant supported prosthesis over a fixed partial restoration are decreased risk of decay and periodontal disease, decreased risk of abutment tooth loss from endodontic failure or caries, and improved esthetics (because the adjacent teeth may remain unrestored).³

A key factor in esthetic success is the presence or absence of adequate alveolar bone (height, volume, and thickness of the cortical plate) at the implant site, since the gingival contour follows the underlying osseous crest³⁻⁴. In the maxilla, atrophy is more severe during the first month of post-extraction and the loss of buccal alveolar plate following tooth extraction may lead to palatal implant positioning of the

Abstract:- The goal of modern dentistry is to restore the patient to normal contour, function, comfort, esthetics, speech, and health, whether restoring a single tooth with caries or replacing several teeth. Dental implant placement to replace missing teeth has been documented to be a predictable treatment modality with high success rates. The present case report discusses the advantages of an endosseous implant-supported prosthesis over a fixed dental prosthesis.

Keywords: implant, crown, single edentulous space, delayed loading

implants. Implant placement and delayed loading with modified crown design is in relation to maxillary left first premolar region is also described, which is in harmony with the surrounding hard and soft tissue.

Case Report

A 39 year old male patient reported to the Department of Prosthodontics, career post graduate institute of dental sciences and Hospital, lucknow with the complaint of un-esthetic look and difficulty in eating in relation to upper left back region. Patient did not have any positive medical history. Clinical and radiographic examination showed missing maxillary left first premolar. Past dental history revealed that it was extracted 9 mont back. (fig. 1).



Fig. 1 Missing left first premolar in maxillary arch

Missing area had the space of 10 mm mesiodistally and 8 mm buccolingually (fig.1). No occlusal abnormality seen. There was no periapical or periodontal pathology is seen in relation to maxillary left canine and left second premolar area (fig 3a and 3b).

Treatment plan

The patient was given detailed explanation

concerning the present state, alternative treatment plans, and the procedure, and informed consent was obtained from the patient. Treatment plan accepted by patient was placement of endosseous dental implant with delayed loading in relation to maxillary first premolar. Implant size-5.0 x 11.5 mm was decided on the basis of clinical and radiographic findings.



Fig: 3a and 3b: Diagnostic OPG

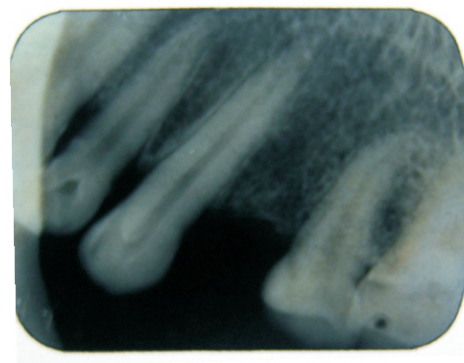


Fig:3b :Diagnostic IOPA irt 24

Critical Assessment Of The Site Treatment procedure

Immediately before the procedure, patient was asked to rinse his mouth for 2 minutes with a 0.12% chlorhexidine digluconate solution. Following an injection of 2% lignocaine with 1:100,000 epinephrine local anesthetic. A surgical template was used to locate the desired implant position. Sequential drilling was performed following which selected implant was placed with insertion torque of 40Ncm (fig 4a, 4b, 4c).

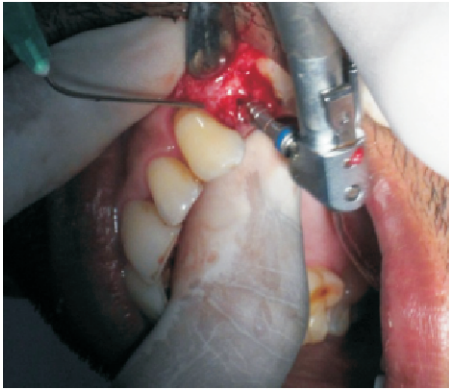


Fig: 4a, 4b, 4c: Sequential drilling, osteotomy site & implant placement

After hand-tightening of the implant the flap was repositioned and the wound was closed by means of two sutures. The patient was placed on amoxicillin 500mg thrice daily for 5 days ,mefenamic acid 500mg initially ,then 250mg four times a daily for 5 days and asked to do gargle with chlorhexidine digluconate .12% twice daily for two weeks. Post surgical radiograph showed satisfactory implant position. The patient reported with no specific symptoms and he did not show any adverse clinical signs.

In second stage surgery after 3 month

gingival former was placed and left for 1 week for soft tissue recontouring(fig. 6). Closed tray transfer with indirect transfer coping was used to make impression with polyvinylsiloxane (fig. 7) .Abutment was milled and verified in patient's mouth.Shade selection was done and final prosthesis was made with hole in center of the crown . Hole in the center was made so that during abutment loosening it can be tightened without removal of cemented crown. (Fig. 8) Cementation was done with noneugenol cement(fig. 9a, 9b). Patient recalled after one week, one month and six month interval to evaluate the situation and was found normal. The radiograph(IOPA) was again taken to evaluate the condition of the implant. It was found that there were proper osseointegration with no peri-implantitis.(Fig. 10). The prosthesis was well in function up to the final evaluation .The soft tissue health and width of the ridge was well maintained with good esthetic and function result.(fig 9b)



Fig. 6: Gingival former placement irt 24

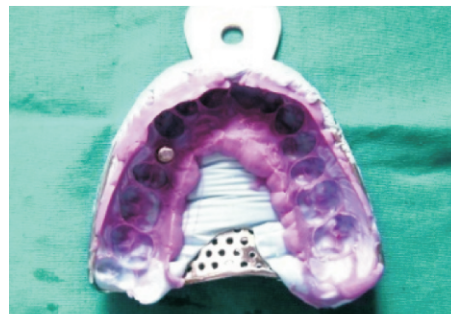


Fig. 7: Closed Tray Impression For Final Prosthesis Irt 24

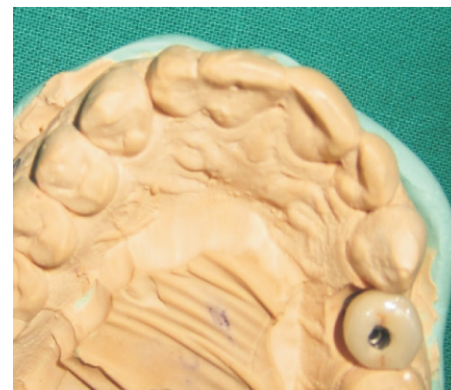


Fig. 8: Modified Crown Design Irt 24

Discussion

Replacement of a single missing tooth with an implant-supported crown is a much more conservative approach than preparing two adjacent teeth for the fabrication of a tooth-



Fig. 9a: palatal view of final prosthesis irt 24



Fig. 9b: Final Prosthesis In Occlusion Irt 24



Follow up IOPA showing final prosthesis irt 24 supported fixed partial denture.5

Ultimate result of tooth loss is reduction in bone volume, density, height and width .Thus resulting in a situation that corresponds to a condition where the sufferer will not only have compromised function but also esthetics and psychology.In this case report, the harmony of soft and hard tissue was achieved by endosseous implant placement with delayed loading in maxillary posterior region⁶.

It is no longer necessary to “cut” healthy or minimally restored adjacent teeth to replace a missing tooth with a nonremovable prosthetic replacement. Reported success rates for single-tooth implants are excellent. Replacement of an individual missing posterior tooth with an implant-supported restoration has been successful as well. The greatest challenges to overcome with the single-tooth implant restorations were screw loosening and implant or component fracture. Because of increased potential to generate forces in the posterior area, the implants, components, and screws often failed. Both these problems have been addressed with the use of wider-diameter implants and internal fixation of components.5

In this case report, a hole in occlusal surface of crown was given as to tight the screw during abutment loosening.

In this case report, advantages of implant supported fixed dental prosthesis over 3 unit fixed teeth supported bridge was explained to patient. Carl E. Misch has mentioned that Single tooth implant have several advantages like;

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High success rates (above 97% for 10 years), Decreased risk of caries of adjacent teeth, Decreased risk of endodontic problems on adjacent teeth, Improved ability to clean the proximal surfaces of the adjacent teeth, Improved esthetics of adjacent teeth, Improved maintenance of bone in the edentulous site, Decreased cold or contact sensitivity of adjacent teeth, Psychological advantage, Decreased risks of adjacent tooth loss.²

A surgical template should be properly constructed to assist in implant placement⁷ In adult patients, the use of osseointegrated dental implants is often the treatment of choice due to their independence from adjacent teeth, which are spared for preparation as bridge abutments. However, implant placement in young patients involves risks due to the “ankylosed” nature of the implant. As a result, the implant does not follow the dento-alveolar development. This nature could lead to infra-occlusion of the ankylosed implant with potential periodontal, occlusal and esthetic consequences in the future^{1,8,9}. On the other hand, studies have demonstrated that alveolar remodeling and growth does not cease at puberty and vertical discrepancy between a single dental implant and its adjacent natural teeth continue to occur in adulthood^{1,10,11}. Therefore, postponement of dental implant placement in young patients does not necessarily exclude further complication.

If root stumps are present without any periapical pathology, immediate implant is also good treatment of choice. Immediate implant placement is regarded as a viable technique; provided that proper patient selection and meticulous surgical procedures are adopted¹². Clinical studies have demonstrated that the success rate of immediately placed implants is similar to that implants placed after healing of extraction sites¹³⁻¹⁵. Immediate or early implant placement in the extraction socket has been suggested as it would reduce the time period and the number of surgical intervention and yield higher patient satisfaction compared with delayed placement implants¹⁶.

Conclusion

Clinicians can choose from a wide variety of treatment options, techniques, and materials. The choice of the treatment protocol depends primarily on 2 considerations: the experience, knowledge, and cooperation of the clinicians involved, and the expectations of the patient

coupled with the understanding that excellent results require time. Endosseous dental implant supported crown is a much more conservative approach than preparing two adjacent teeth for the fabrication of a tooth supported fixed partial denture and also yields higher patient satisfaction.

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