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## Single-tooth implant supported prosthesis with bony defects in the esthetic zone: Case report

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### Abstract

Dental implants are commonly thought of as an alternative to dentures or fixed bridges, but they are also frequently the best treatment option for replacing a single missing tooth. Implant can be placed at the site of the missing tooth without affecting surrounding teeth. Present case report illustrates implant supported prosthesis in the maxillary anterior region with single wall bony defect, which was augmented by synthetic bone graft.

**Keywords:** Anterior maxilla, single dental implant, single wall bony defect

### Introduction

Dental implant treatment has evolved into an excellent oral rehabilitation modality during the last few decades. The use of dental implants at partially edentulous sites has been expanded due to high survival and success rates. Single tooth implants have become a common procedure in modern dentistry with excellent predictability and clinical results [1]. The growing use of single-tooth implants in the maxillary anterior region, either immediately or at varied intervals after tooth extraction has been increased because of its clinical and esthetics importance [2-4].

In the anterior maxilla, dental rehabilitation with implant-supported single crown shows a success, but it has predominantly been characterized as the absence of mobility or pain, and a lack of progressive bone loss. It provides emergence profile with optimal colour of the periimplant mucosa and does not affect the surrounding teeth [5]. A variety of surgical procedures such as bone augmentation, connective tissue grafting, and papilla repair have been devised to manage the peri-implant hard and soft tissues to maximise the cosmetic outcome [6]. Extraction sockets in maxillary region frequently present with the bony defects. The clinician has to opt for augmentation procedures to compensate for the defect by using autogenous bone graft like PRP or synthetic graft like alloplast [7]. Present case report illustrates implant supported prosthesis in the maxillary anterior region with single wall bony defect, which was augmented by synthetic bone graft.

### Case report

A 37-year-old female patient reported to the Department of Prosthodontics and Crown & Bridge with the chief complaint of upper front tooth loss owing to trauma three years ago. The patient was not suffering from any systemic illness. On the extraoral examination, face was bilaterally symmetrical, no midline deviation. A thorough intraoral examination revealed missing right maxillary lateral incisor. The patient's general periodontal condition was healthy. On radiographic evaluation, it was discovered that the missing region had acceptable bone height and width, but small radiolucency mesial to canine (Figure.1A, 1B). The patient was presented with various treatment options like conventional fixed dental prosthesis, cantilever fixed dental prosthesis and dental implant, after discussing the benefits and drawbacks of each the treatment option. She didn't want to sacrifice adjacent teeth so she was agreed upon implant placement in missing area. An endo-osseous implant measuring 3.75 x 10 mm was selected (Adin Dental Implant Systems LTD; Israel). Written consent was taken from the patient.

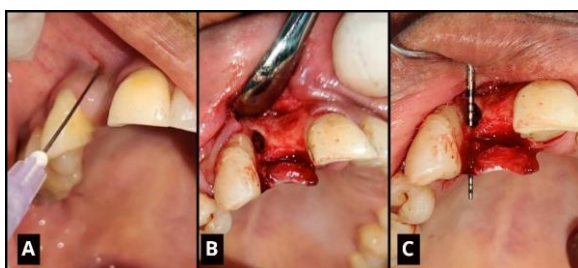
Routine blood examination was done for the patient and results were found to be within normal limits. The local anaesthetic 2 percent lidocaine with 1: 80,000 was administered at the missing right lateral incisor. A palatally positioned full-thickness incision was performed and the flap was raised. There was a single-wall bony defect close to the edentulous area that was lined by only the mesial wall. After proper curettage and cleaning with normal saline palatal wall defect also got exposed, through and through defect was checked with williams probe. (Figure. 2A, 2B, C). In the edentulous area, the bucco palatal bone width and mesiodistal length were measured to be 7mm, so an osteotomy was drilled according to the manufacturer's instructions. Parallelism with adjacent teeth was assessed using the paralleling pin. A tapered wall, threaded, rough surface implant was then placed and primary stability was achieved at 35N, a cover screw was placed on top of the implant. (Figure. 3A, 3B, 3C, 3D)

Synthetic bone graft (B-OstIN, Basic Osteointegration) was used to fill and pack the bony deficiency. (Figure 4A, 4B). The flap was closed with the help of silk 3.0 sutures. Appropriate antibiotic (Augmentin 500 mg, 2 times daily for 5 days) and analgesic (Zerodol SP 2 times daily for 5 days) and (Pantoprazole 40 mg, 1 time daily) were prescribed and post operative instructions were given. Patient was recalled for suture removal after 7 days. After 4 months of osseointegration period, incision was given to expose cover screw and healing cap (Adin Dental Implant systems LTD; Israel) was secured on the implant. Close tray impression coping (Adin Dental Implant systems LTD; Israel) placed, followed by a Poly Vinyl Siloxane used for (Aquasil, Dentsply/Caulk, Milford, DE) close-tray impression to capture the position of the implant. The impression coping was removed and the healing abutment replaced, shade was also recorded. The case was then sent to the laboratory for porcelain fused to metal crown.

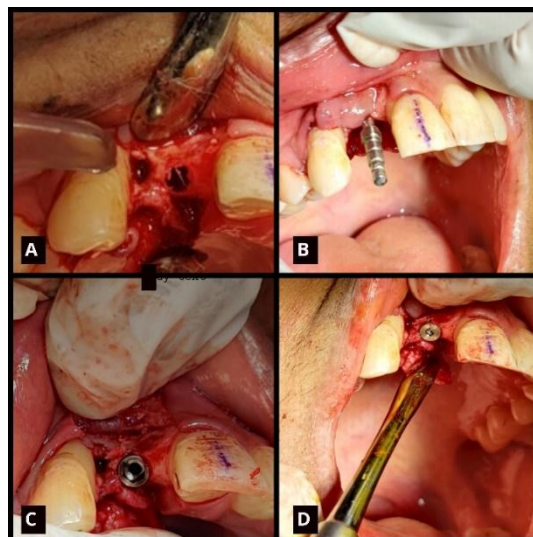
The prefabricated abutment (Adin Dental Implant systems LTD; Israel) was placed; a radiograph was taken to confirm the seating of the abutment. The abutment was then torqued with the help of a torque wrench. The PFM crown was then placed, the proximal contacts and occlusion verified. In maximum intercuspation there was light contact with no contact in protrusive and lateral excursions. The PFM crown was then cemented with the help of GIC cement (GC Gold label; GC Corporation, Japan). Excess cement was removed and the occlusion was verified again. The proximal contacts and occlusion was checked. (Figure. 5A, 5B, 5C, 5D). The patient was very happy with the final esthetic and functional outcome. Oral hygiene instructions were given to patient and recall after 3 months for regular check-up.



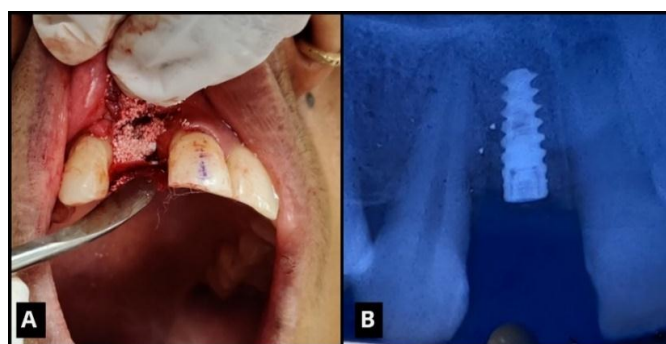
**Fig 1A, 1B:** Missing right maxillary lateral incisor and CBCT



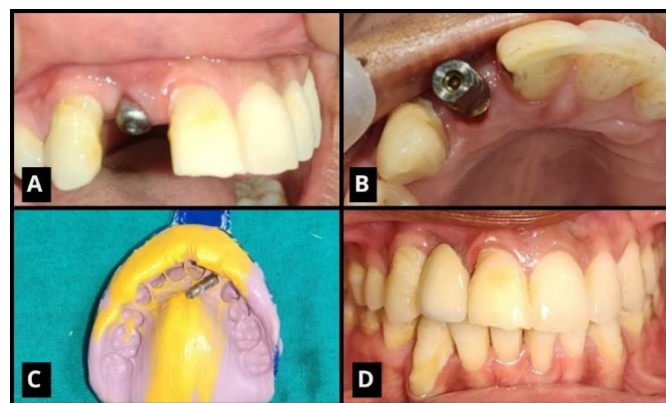
**Fig 2A, 2B, 2C:** Administration of anesthesia and flap was raised, single-wall bony defect with trough and through probe passing



**Fig 3A, 3B, 3C, 3D:** Osteotomy site, Parallelism checked by paralleling pin, Implant placement, Cover screw placement done



**Fig 4A, 4B:** Synthetic bone grafting and Postoperative IOPA



**Fig 5A, 5B, 5C, 5D:** Gingival former placement, Closed tray impression coping placement for implant impression, Implant impression and final prosthesis placement done

**Discussion**

Replacement of missing teeth with soft and hard tissue defects has been completed with the goals of preserving residual dental structure, ensuring optimal retention, stability, and pleasing aesthetics. The appearance of an implant-supported tooth typically takes priority over its biomechanical integrity in today's aesthetic zone. The soft tissue component of a successful aesthetic result is characterized by a pink healthy gingival margin with scalloped papilla and a natural tooth contour [8]. Obtaining good esthetics at these locations is challenging because of difficult pre-existing anatomy. The ultimate goal of a dental implant is to restore missing teeth by placing implants that are anatomically correct and esthetically pleasing in functional positions that ensure long-term

durability<sup>[9]</sup>.

The use of dental implants to replace missing teeth in the maxillary anterior region is a potential treatment option. Fixed dental implant-supported prosthetics have numerous advantages over traditional crown and bridge or removable tooth-borne prosthetics. Dental implants provide several advantages, including the preservation of residual bone, ease of oral care, greater longevity, and non-involvement of neighbouring teeth<sup>[10]</sup>.

### Conclusion

Dental implants have helped to improve the quality of life for our patients. A missing tooth in the anterior region is not only a physical loss, but also may be an emotional experience for the patient as well. The single-tooth implant restore the lost tooth with both optimum function and esthetics.

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