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SOCKET SHIELD WITH PRECISION ATTACHMENT-CASE REPORT

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Abstract:
Healing of the extraction socket results in dimensional adjustments with the intention to have an effect on the placement of the implant and its emergence profile. Atraumatic extraction, socket shield technique, and immediate implant placement lower the alveolar bone resorption by means of keeping the postextraction socket. Hürzeler et al. delivered a socket-shield approach with the aid of preserving a buccal fragment of the teeth to prevent the buccal cortical bone from resorption. This case report shows partial extraction therapy with the decayed teeth followed by implant placement with zirconia with Emax layering crown. A precise subject of a removable denture in comparison to the different prostheses is retention. The aspect of a removable denture which offers retention is known as a direct retainer. A direct retainer can be both an extracoronal or intracoronal. One of the main disadvantages of extracoronal retainers utilized in partial dentures is visibility. Many patients may not be comfortable while these retainers are positioned on teeth in visible vicinity. The solution for this trouble is using a Precision attachment. This case report also shows unilateral precision attachment removable partial denture.
Keywords: Socket shield technique, Implant, Precision attachment.

Introduction:

Extraction of teeth changes the dimension of the alveolar ridge, which has an instantaneous effect on future implant prosthesis and its emergence profile, especially within the anterior region. Removal of the teeth severs the rich PDL vasculature that substances the alveolar bone. Preservation of the roots of tooth have proved to be helpful in retarding the resorption

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procedure. Therefore a modern technique of placing implants in close relation with deliberately retained roots, for this reason protects the buccal bone from resorption. The method is referred to as the Socket Shield Technique.[1] Rehabilitation of partially edentulous Kennedy's classification II is difficult when fixed prosthesis like implant placement is impossible due to unwillingness of the patient and assumes fixed prosthesis which isn't always feasible as there is no distal abutment (Gupta et al, 2013). Therefore, prosthesis which consists of constant prosthesis (crown) preserving acrylic partial denture with precision attachment is better alternative. Precision attachment denture combines fixed and detachable prosthodontics in such a manner as to create maximum aesthetic partial denture.[2] According to glossary of prosthodontics terms, Precision Attachment is defined as A retainer consisting of a metal receptacle (matrix) and a closely fitting part (patrix); the patrix is usually contained within normal or expanded contours of the crown on the abutment tooth and the matrix is attached or embedded to a pontic or the removable partial denture framework. From an affected person's view factor no different appliance offers greater comfort, security and esthetics than the only fabricated along with precision attachment.[3]

CASE REPORT:

The patient was referred to the Department of Prosthodontics , Crown and Bridge, D.Y. Patil University, School of Dentistry, Nerul, Navi Mumbai, with a complaint of decayed upper front teeth and missing teeth in the lower right back region. (Figure 1A and 1B) Clinical examination, it revealed that 11 carious and missing 46, 47. Partial extraction therapy for 11 followed by implant placement with Zirconia and Emax layering crown and unilateral precision attachment with 46, 47 with PFM crowns on 44, 45 was planned.

Precision Attachment Removable Partial Denture Fabrication

A diagnostic impression was made with alginate(Tropic Algin). The abutment teeth 44 and 45 were prepared (Figure 2) and the final impression (Figure 3) was taken with the polyvinyl siloxane material(Zhermack Zeta Plus). The cast was poured and sent to the laboratory. Metal substructure (Figure 4) with the precision attachment was checked intraorally. Bisque trial was done(Figure 5). Porcelain fused to metal crown was fabricated with the abutment teeth(Figure 6 and 7). Final crown was cemented with glass ionomer cement.(Figure 8,9) Final prosthesis with removable denture was fabricated and checked intraorally and was delivered to the patient(Figure 10,11).

Socket Shield Technique

The CBCT scan for 11 was advised and examined(Figure 12, 13). Incision and Flap reflection was done(Figure 14,15) . The palatal root of 11 was extracted(Figure 16). Decoronation of buccal shelf was done(Figure 17). Implant was placed with 11(Figure 18). Bone grafting was done(Figure 19). Sutures were placed(Figure 20). Interlig used to splint the temporary crown(Figure 21). Wax up of 11 was done(Figure 22). Temporary abutment was modified according to tissue sculpting(Figure 23). Modified temporary abutment was placed(Figure 24). Screw retained temporary crown was made on modified temporary abutment with composite using silicon index(Figure 25). The desired tissue sculpting was achieved after 2 weeks(Figure 26,27) . Impression post was placed on index and flowable composite was flowed(Figure 28). Modified impression post was then achieved(Figure 29). Final abutment was then placed inside the mouth(Figure 30,31)). Final crown in zirconia with Emax layering was done.

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Discussion:

In this case report, socket-shield technique was utilised in an area in which the buccal cortical plate was thin. The root fragment was attached to the buccal bone and immediate implant was placed to maintain the ridge contour. The results were consistent with the original technique proposed by Hürzeler et al.[4] No postoperative complication was seen and healing was uneventful. Root segment was preserved to prevent alveolar bone resorption was shown in many studies.[5] Salama et al. reported the root submerge technique, in which root was submerge in the pontic area to preserve the dimension of the alveolar bone.[6] Krumph and Barnet showed a high success rate of immediate implant placement, and it has many advantages over the delayed loading as the time is reduced for a final prosthesis[7], second-stage surgery and extraction socket helps in directing the proper angulation of the implant and decrease the chance for the angulated abutment.

According to GPT-9, "Precision attachment is a retainer consisting of a metal receptacle (matrix) and a closely fitting part (patrix) ; the matrix is usually contained within the normal or expanded contours of the crown on abutment tooth/ dental implant and the patrix is attached to a pontic or a removable partial denture" (Ferro,2017).[8] Precision attachment is mostly indicated for edentulous arches which is long span, distal extension cases and abutments which are non parallel (Gupta et al, 2013).[9] Precision attachment is a connector consisting of 2 or more parts. One part is connected to root, tooth or implant and other part to the prosthesis. The attachment system used was extracoronal attachment placed on distal surface of crown. The male castable component could be shaped easily with crowns during wax-up stage. Female component completely covers the male component. Fixed removable prosthesis was first introduced by Dr. James Andrews (Munot et al, 2017; Walid, 1995; Jain, 2013).[10] With proper case selection, diagnosis and treatment plan, precision attachment denture is a good treatment option. The limitations are its fabrication requires well-trained lab technicians and with time due to wear and tear parts of attachment needs to be replaced (Angadi et al, 2012).[11]

Conclusion:

This case report clarifies the dilemma of giving either fixed or removable prosthesis in cases where distal abutment is missing and patient is not willing for implants due to many reasons. . Combined prosthesis is the solution of placing prosthesis in distal extension cases which does not indicate surgery. Combined prosthesis consists of fixed prosthesis (crown) and removable prosthesis (acrylic partial denture) which are attached to0 each other by an attachment system.

This present case report of immediate implant placement with socket-shield technique shows successful preservation of post extraction tissue and thin buccal bone with successful restoration of the implant. Socket-shield technique shows a promising result in the preservation of post extraction socket and holds significant value in implant and esthetic dentistry.

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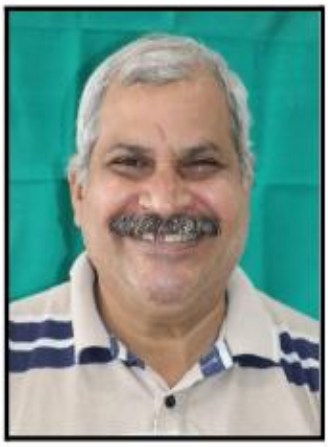

Figure 1A - Pre- operative Extraoral facial view

Figure 1B Pre-operative Intraoral view

Figure 1B Pre-operative Intra oral Maxillary view

Figure 1B Pre-operative Intra oral Mandibular view

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Figure 2 Tooth Preparation with 44, 45

Figure 3 Final Impression of prepared tooth

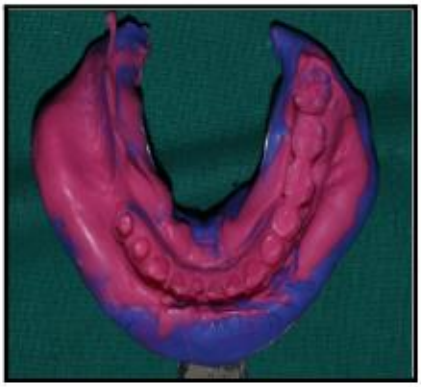

Figure 4 Metal trial - 44, 45

Figure 5 Bisque trial

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Figure 6 Final crown cemented- Lateral view

Figure 7 Final crown cemented- Occlusal view

Figure 8 Final prosthesis with removable denture- Lateral view

Figure 9 Final prosthesis with removable denture- Occlusal view

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Figure 10 Final prosthesis- Front view

Figure 11 Final prosthesis- Intaglio view

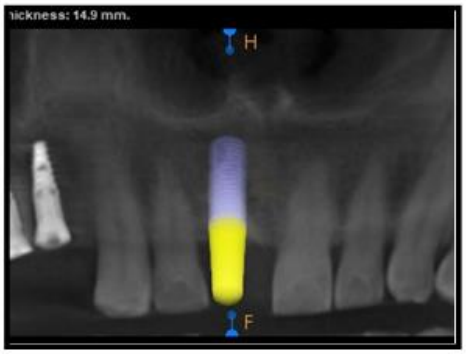
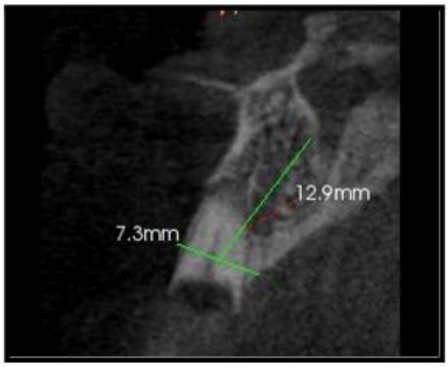


Figure 12 CBCT scan- OPG view

Figure 13 CBCT scan- 11



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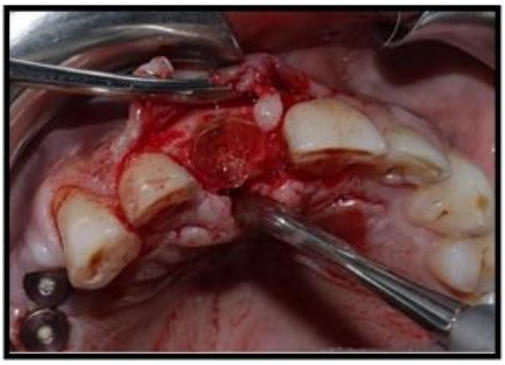


Figure 14 Incision and Flap reflection

Figure 15 Palatal Fragment removed of 11

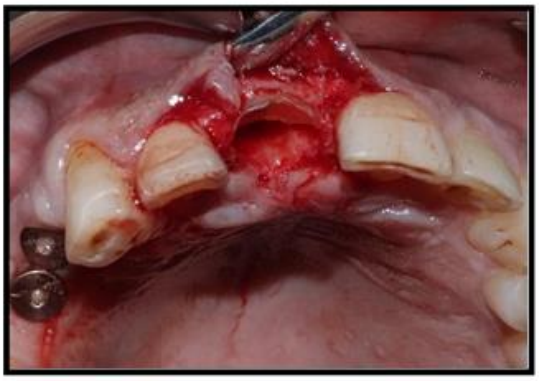
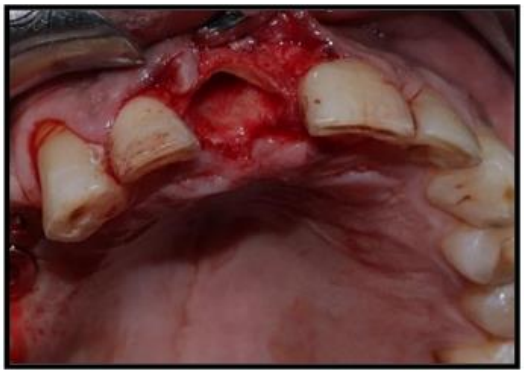


Figure 16 Palatal fragment with apex removed

Figure 17 Decoronation of Buccal shelf



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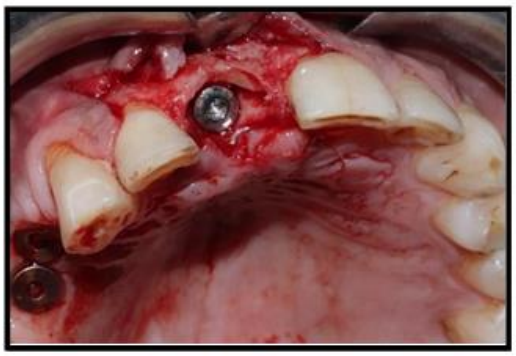

Figure 18 Implant placement with 11

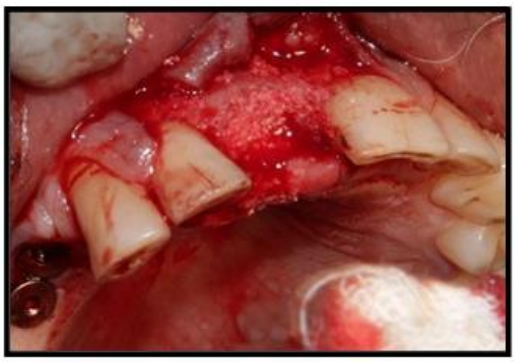

Figure 19 Jumping distance filled with Bone Graft

Figure 20 Suture given

Acrylic crown given

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Figure 21 Interlig used to splint acrylic crown

Figure 22 Wax-up of 11

Figure 23 Temporary abutment modified according to tissue sculpting

Figure 24 Modified temporary abutment placed

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Figure 25 Screw retained Temporary crown on modified temporary abutment with composite using silicone index

Temporary crown-Occlusal view

Figure 26 Desired tissue sculpting achieved after 2 weeks

Figure 27 Tissue sculpted for emergence profile-Buccal view of Tissue

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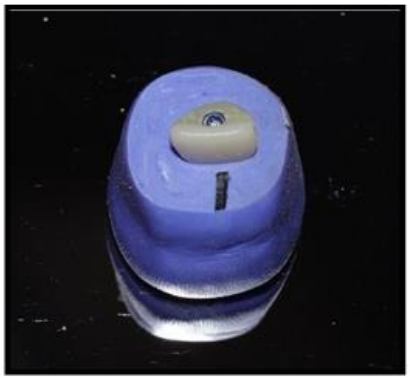
Temporary crown analogue assembly- Buccal view

Temporary crown analogue assembly- Palatal view



Indexing the achieved profile and marking the labial side

Profile achieved on the index

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Figure 28 Impression post placed and flowable composite flowed

Figure 29 Modified impression post achieved

Modified impression post placed- Occlusal view

Modified impression post placed- Buccal view

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Modified impression post analogue assembly

Final Impression

Figure 30 Final Abutment

Figure 31 Final crown in Zirconia with emax layering- Frontal view

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Post- operative- occlusal view

Immediate Post-operative frontal view

Post- operative smile

Post- operative view after 2 weeks

Post- operative view after 2 weeks

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