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Socket preservation and reconstruction: A case report with follow up of 9 months

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Abstract

Progressive bone resorption after extraction of tooth may lead to prosthetic-driven and surgical difficulties when a dental implant has to be placed after extraction of tooth. This case report discusses an irreparable upper right first premolar with a dehiscence on buccal wall. A conservative tooth extraction was performed and the dehiscence was exposed after reflecting a full thickness mucoperiosteal flap. The socket and the dehiscence were then grafted using Nova bone putty and amnion membrane. After a healing period of 3 months and 9 months a CBCT analysis was done to check for regeneration in the grafted site. It can be concluded that grafting technique can lessen the alveolar bone resorption in the socket with dehiscence.

Keywords: Socket preservation, regeneration, dehiscence, nova bone

1. Introduction

Whenever a tooth is lost there are morphological changes which takes place in hard and soft tissues around it. After extraction there are changes in horizontal and vertical dimensions of alveolar bone/socket [1, 2]. Initial 3-6 months post extraction are critical as maximum remodeling of alveolar bone takes place during this time period only [3, 4]. Hence, preservation and maintenance of bone post extraction is necessary for ensuring aesthetics and functional stability of prosthesis. Success of implant is dependent on the amount of osseointegration which takes place, which is further influenced by amount of bone near implant. If there are severe bone defects near the socket, it will hamper the primary stability of implant which will further affect the osseointegration [5].

2. Case Report

A 31-year-old male patient with non-contributory medical history reported to the department with a chief complaint of fractured root canal treated tooth and broken prosthesis that was not restorable. When the patient was clinically examined there was insufficient crown height making placement of prosthesis difficult. The patient was then given the option of immediate implant placement and the patient was advised CBCT. The CBCT showed buccal bone resorption and no buccal bone present to support the implant. After discussing the treatment options with the patient, he agreed for socket preservation with bone regeneration on the buccal wall for implant placement after 6 months. Informed consent was obtained from the patient. A thorough scaling and root planing was performed 2 weeks prior to the surgery. At the time of surgery under local anesthesia, a periosteal elevator was used to detach the periodontal fibers and then luxate the tooth. The tooth was then extracted with the help of extraction forceps. After tooth extraction sulcular incisions were given extending up to the mesial and distal adjacent tooth which was followed by two vertical releasing incisions. A full thickness mucoperiosteal flap was raised up till the mucogingival junction to expose the bone dehiscence. Curettage was done in the socket with a spoon excavator and remaining granulation tissue was removed and then the socket was rinsed with sterile saline. Amnion membrane was shaped to cover the dehiscence on the buccal wall with at least 1mm onto the bone margin to ensure membrane would not collapse in the socket.

After adapting the membrane around the defect area, the socket and the buccal defect was filled with Nova bone completely filling the socket. The membrane was placed between the flap and bone and then the flaps were sutured using 3-0 silk sutures. Postoperative instructions were given to the patient along with antibiotics to minimize the risk of postoperative infection. Tab amoxicillin 500mg TDS for 5 days and metronidazole 400mg TDS for 5 days was prescribed to the patient. Paracetamol was given to the patient to reduce the postoperative pain. After 2 weeks the sutures were removed. After one month the wound completely healed.

After 3 months the patient was recalled for clinical and radiographical examination. On CBCT evaluation it was observed that there was radiolucency seen in the grafted area. Partial bone fill was seen (Figure 5). Clinical examination of the socket preservation site showed proper healing of the tissues. After 9 months again a CBCT was taken to check for bone regeneration. CBCT evaluation showed radiopacity in the grafted site showing bone regeneration in the area of socket preservation (Figure 6).



Fig 1: Preoperative front view



Fig 2: Post extraction site



Fig 3: Dehiscence seen on buccal wall



Fig 4: Socket preservation done using Nova bone and Amnion membrane



Fig 5: CBCT evaluation after 3 months

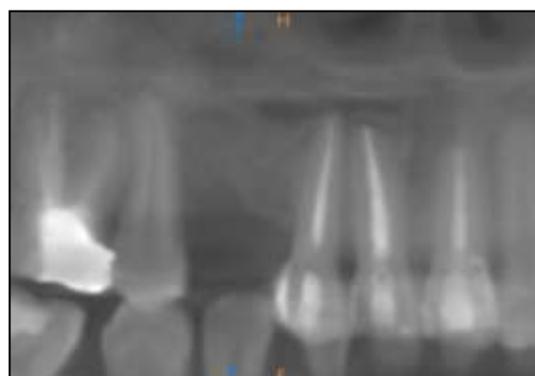


Fig 6: CBCT evaluation after 9 months

3. Discussion

GBR techniques in socket preservation have been approved in many studies using different materials. studies have quoted that membrane placement in socket preservation along with bone grafts gives better results than no membrane placement [6, 9].

In this study there was a need of socket regeneration rather than socket preservation as there was a buccal wall dehiscence present. A full thickness mucoperiosteal flap was raised to gain access on the defect site. However, there are certain disadvantages of raising a flap during socket regeneration that are it can cause dehiscence of wound, tension in flap, decrease in amount of keratinized tissue, and reduction in vestibular depth. To reduce these drawbacks there are newer techniques which have come which is more conservation and requires no flap reflection [10, 11]. According to Yip, *et al* [12] the grafting material should have certain specific attributes. It should be biocompatible, osteoconductive and osteoinductive. Autografts, Allografts, Xenografts and Alloplasts with or without a membrane have shown adequate results in ridge preservation [13]. In this study we used Nova bone putty which is an alloplastic synthetic bone substitute that consists of calcium phosphosilicate. Alloplasts belong to a group of biocompatible, synthetic osteoconductive bone substitute that is free of any probability

of disseminating infections. There is a strong evidence that calcium phosphate present in nova bone apart from being osteoconductive also has osteoinductive properties. It has been shown that alloplastic materials can stimulate osteogenic differentiation of stem cells ^[14, 15].

4. Conclusion

Socket regeneration with buccal wall dehiscence using GBR technique can minimize further bone resorption and help in further placement of implants.

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