Implant Placement in a Site with Periapical Pathology After Tooth Removal: A Case Report

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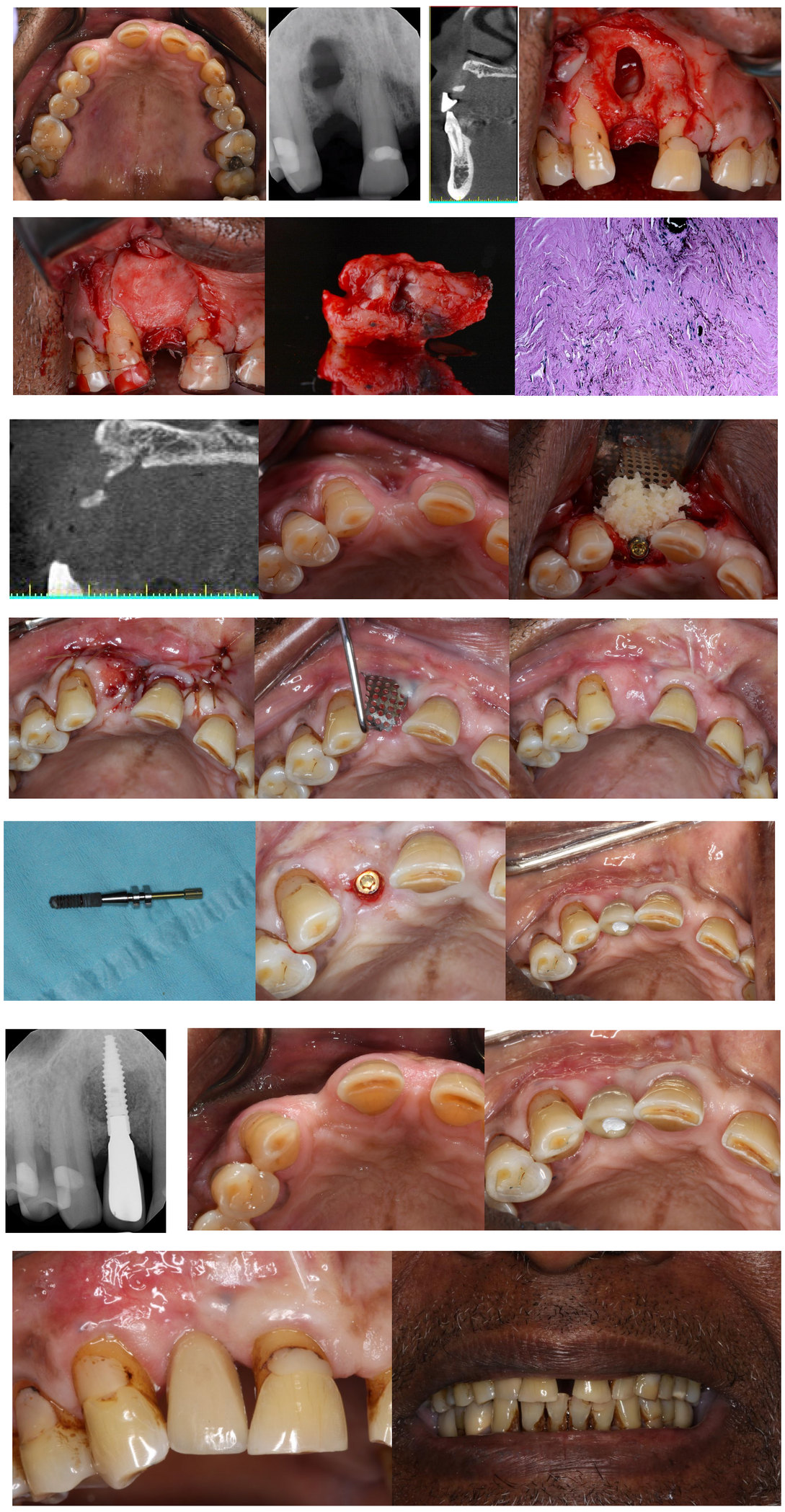
INTRODUCTION

A ridge deficiency due to pathological conditions around an extracted hopeless tooth produces a compromised site for implant placement. Pathological conditions with benign histological diagnoses and limited size can be removed by primary excision and site development performed for proper implant placement. Currently, augmentation of deficient implant sites can be performed at various times following tooth removal. However, for smaller defects, spontaneous regeneration is possible. This case report presents a through and through 15 mm defect which required a specific management strategy to prevent soft tissue proliferation into the defect site. A successful treatment sequence for implant placement in a 15 mm defect is presented, from lesion removal to grafting and implant placement. It demonstrates that thorough planning and treatment in a timely manner will result in a successful augmentation procedure and serve as a strong basis for subsequent implant placement.

METHODS & MATERIAL



METHODS & MATERIAL

Materials and methods
A 69-year-old male patient was referred to the Ashman Arthur Department of Periodontology and Implantology, College of Dentistry, New York University, New York with the chief complaint of “I want to get everything in my mouth fixed”. His medical history included hypertension and hypercholesteremia. He presented with an edentulous maxillary right lateral incisor area with history of extraction due to failed endodontic re-treatment.

A periapical radiograph showed a well-defined radiolucency in the maxillary right lateral incisor edentulous area. Cone-Beam Computed Tomography (CBCT) revealed large through and through labio-palatal bony defect. An excisional biopsy was planned to establish a definitive diagnosis and management of the lesion before any further surgical or restorative treatment planning of the site.

Excisional biopsy and bone ostectomy with first GBR procedure
All procedures were performed under local anesthesia (2% lidocaine, 1:100,000, Dentsply Sirona, USA). A crestal incision was made at the edentulous site from the maxillary right lateral incisor to the right central incisor and two vertical releasing incisions were made labially at the mesial of the maxillary right central incisor and distal of the maxillary right canine. A palatal intrasulcular incision was made from maxillary left central incisor to the maxillary right second premolar. Full-thickness mucoperiosteal flaps were reflected labially and palatally to gain access to the lesion. The lesion was attached to the periosteum of the labial and palatal mucosa requiring surgical dissection which clinically revealed the through and through defect.

Enucleation of the lesion and bone debridement were performed. The through and through defect was assessed for complete lesion excision before it was filled with xenograft bone particles (Geistlich Bio-Oss Large Particle & Geistlich Bio-Oss Small Particle & Zimmer Puross Cancellous Particulate Allograft) and packed between the two fitted resorbable membranes (Zimmer Pericardium Copioss) which were contoured and placed labially and palatally. The excised specimen was sent for histopathological diagnosis. A postoperative periapical radiographic was taken to confirm the existence of the bone graft in the bony defect.

At one-week follow up, a labial V-shaped tissue dehiscence in surgical site was observed with partial loss of the labial membrane and the bone graft. The palatal membrane, however, was still intact. The dehiscence was observed and irrigated weekly for seven weeks until the epithelial closure was achieved. A postoperative periapical radiographic was taken which showed the radiolucent area where the cyst was removed in the maxillary right lateral incisor edentulous area.

Histopathology result
The histopathology result showed irregular fragments of dense fibrous connective tissue with sparse chronic inflammatory infiltrate with no cystic epithelium found. The lesion was diagnosed as chronic fibrosing inflammatory reaction. This indicated the benign nature and the low recurrence rate of the pathological lesion.

Second GBR procedure with implant placement followed by loading
Following soft tissue healing, a second CBCT was performed to evaluate bone healing and to plan for implant placement. The CBCT showed a smaller bony defect with woven bone surrounding the remaining bone graft particles in the palatal area. Guided bone regeneration and implant placement was planned.

The flap was made and reflected and an implant (Straumann 3.3x12 Narrow Crossfit Connection BL SLActive Roxolid, Switzerland) was placed and covered with titanium mesh and bone graft particles (Zimmer Puros Large Particle Cancellous & Zimmer Puros Small Particle cortical). A titanium mesh was secured apically by mini screws while the coronal part was secured by intramucosal resorbable sutures (chromic gut 4/0 suture, Ethicon, Johnson and Johnson Family, New Jersey, USA). A postoperative periapical radiographic was taken to confirm the implant placement and the existence of packed bone graft in the bony defect.

One week later, the titanium mesh was exposed. It was monitored and irrigated with 0.9% normal saline solution weekly until the epithelial closure was achieved. A seven weeks timeframe allowed for the soft tissue to grow under the mesh before the mesh and screws were subsequently removed. At the nine week follow up visit, second stage surgery was performed.

During final impression, the fixture was found to be mobile and removed along with the impression coping and a one-stage flapless implant placement was performed (Straumann 3.3x14 BLT Narrow Crossfit Connection BL SLActive Roxolid, Switzerland). Twelve weeks of healing was allowed before obtaining the final impression. Loading with final restoration was done at fifteen weeks post-op. A Periapical radiograph was taken to confirm restoration seating at loading.

One-year post-loading follow up
The patient presented one-year post-loading for follow up visit. A follow up CBCT scan was done. Both the clinical evaluation and the CBCT scan showed stable marginal bone levels with no signs (or symptoms) of implant, restoration, or soft tissue complications. There was no recurrence of any pathology. The visual analog score (VAS) scale was used to evaluate patient satisfaction, where zero is equivalent to poor outcomes and 10 corresponding excellent outcomes. Patient gave a VAS score of 9 of 10 for his satisfaction with the treatment outcomes.

DISCUSSION&CONCLUSION

Planning an implant in a site with periapical pathology requires an accurate differential diagnosis of the pathology in order to achieve the removal of the lesion. However, subsequent failure of the implant was probably caused by membrane exposure and contamination of the site during healing. Implant removal, site debridement and placement of a new implant with good initial stability resulted in a successful outcome. Therefore, as seen in the case report, if complications in a site development cause implant failure, proper debridement and new implant placement can be performed at the time of implant removal which in the case report resulted in a successful outcome. More research with a greater number of cases is necessary to confirm the outcomes achieved in this case report.

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