Progressive Attachment Loss Resulting in Tooth Mobility Due to Failure of Endodontic Treatment: A Case Report

Abstract
Because of the relative frequency of both periodontal disease and periapical pathology, it is not surprising that both may occur together, which can result in diagnostic confusion. However there is no doubt that pulp pathology can exacerbate present periodontal problems resulting in gingival recession and eventually tooth mobility. The aim of this report is to show the effect and complications of failure of Endodontic treatment on periodontal tissue.

Key words: Case report; chronic periodontitis; gingival recession.

Methods
Elimination of the pathogenic factor, the use of lateral displaced flap, autogenous bone graft and dental implant placement were performed to restore the lost tissues and tooth.

Results
A clinically significant amount of keratinized gingival tissue and alveolar bone were restored. Dental implant and abutment restored the extracted tooth as part of the treatment plan.

Introduction
Chronic Periodontitis has been defined as an infectious disease resulting in inflammation within the supporting tissues of the teeth, progressive attachment loss and bone loss.1 Teeth with chronic periodontal lesions are typically free of acute symptoms. The patient may be unaware of the condition, except for bleeding on brushing and flossing or bad breath, until sufficient attachment is lost, resulting in increased tooth mobility.

Gingival recession (GR) is a common and undesirable condition. It is defined as the displacement of the marginal gingival tissue apical to the cement-enamel junction with exposure of the root surface to the oral environment.2

The simultaneous existence of pulpal pathology and inflammatory periodontal disease can complicate diagnosis and treatment planning and affect the sequence of care to be performed. Pulpal tissue maybe significantly inflamed and yet exerts little or no effect on the periodontium. As long as the pulp remains vital, it is unlikely that significant changes will occur in the periodontium. Necrosis of the pulp, however, can result in bone resorption and the presence of radiolucency on x-ray radiographs at the apex of the tooth, in the furcation, or at points along the root. The resulting lesion may be an acute apical lesion or abscess, a more chronic periradicular lesion (cyst or granuloma), or a lesion associated with a lateral or accessory canal. The lesion may remain small, or it can expand sufficiently to destroy a substantial amount of the attachment of the tooth and communicate with a periodontal lesion.

Case report
In 2007, a 30-year-old healthy white female presented to the Maxillofacial Department of Damascus General Hospital for the treatment of severe GR and advanced tooth mobility of the upper left central incisor. The patient had a Miller class IV GR with the absence of nearly all of the keratinized gingiva of the offended tooth. Also, there were premature contacts related to the same tooth as a result of bone loss and drifting of the tooth. The tooth mobility was grade 3.3,4

The patient was initially treated with a conventional R.C.T in 2004. Due to the failed treatments, she underwent four separate apicectomy surgeries and a full porcelain crown restoration over three years duration all done per her general dentist. The result was progressive GR and exposure of nearly all the buccal surface of the root and severe mobility of the offended tooth (Figs. 1,2).

Dr. Moutaz Al-Khen
DDS, MSc
Head of Oral & Maxillo-Facial Surgery Department
Damascus General Hospital
Syria
kh.motaz@scs-net.org

Dr. Bader E. Abdeen
DDS
Maxillo-Facial Surgery
Department, Damascus General Hospital, Syria
baderabdeen@yahoo.com

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gingival former was attached (Fig. 13).

Three weeks later, transfer was attached to the implant, and a final impression was made to be sent to the lab for abutment fabrication (Fig. 14).

One week later, abutment was attached to the implant (Figs. 15, 16).

After 1 year, post-operative OPG showed normal bone structure (Fig. 17). Clinical examination showed normal oral tissue around the abutment.

Discussion
Pulpal and periodontal diseases are similar in that both involve an inflammatory process; such inflammation is caused by microbial infection. The difference between pulpal and periodontal disease is essentially shown in the route, location and severity of the inflammatory reaction. With pulpal disease, the body can tolerate inflammation up to certain point where a reversible process occurs. This is similar to gingivitis, which involves reversible inflammatory reaction of the marginal gingiva. However, irreversible inflammation of the pulpal tissues can lead to pulpal necrosis, and irreversible inflammation of the periodontium leads to tissue loss.

Therefore the location and severity of the inflammation result in a variable degree of tissue involvement, which in turn helps the clinician to select the appropriate treatment plan.

Several studies have reported successful bone and attachment regeneration with Bio-oss in periodontal defects\(^5,6\) as well as bone regeneration around implants.

The success and predictability of osteointegrated dental implants have forever changed the philosophy and practice of dentistry. In the past two decades, there has been a shift in periodontology from the philosophy of saving teeth by any mean to one of extracting compromised teeth and replacing them with dental implants for a better and more predictable long-term outcome. Endosseous dental implants and their retained prostheses have had great success over the past few decades following land mark research and development of osteointegrated implants by Branemark \^et al.\^7 - 9 Initially, most prosthetic reconstructions with osseointegrated implants were limited to use in the edentulous patient, with many reports documenting excellent long-term success of implant retained prostheses for edentulous patients\(^5,10,11,12\)

Currently, the long term success of dental implants used to replace single and multiple missing teeth in partially edentulous patient is very good\(^13,14,15,16,17\).

Patient with a missing single tooth will benefit greatly from the success and predictability of endosseous dental implants. Replacement of a single missing tooth with an implant-supported crown is a much more conservative approach than preparing two adjacent teeth for a fabrication of a tooth supported prosthesis. It is no longer necessary to “cut” health or minimal restored adjacent teeth to replace a missing tooth with a non-removable prosthetic replacement. Reported success rates for single-tooth implants are excellent\(^18\).
The patient was placed on phase I therapy for 3 weeks, including fastidious oral hygiene program, scaling and root planning. During phase II therapy, the plan was to extract the tooth, use a lateral displaced flap, fabricate a temporary removable denture, perform a localized bone augmentation and finally implant placement.

Proper and adequate local anesthesia was administered. Extraction of the tooth, and socket debridement were performed (Fig. 3). A full thickness lateral displaced flap was incised and advanced over the socket (Fig. 4). The vascularized flap was secured and immobilized to the palatal mucosa over the remaining bone ensuring that it was not under tension. The patient was instructed to rinse with chlorhexidine (0.12%) mouth wash twice daily for 2 weeks.

Postoperative healing was good. The sutures were removed 10 days after surgery. No dehiscence, infection, or necrosis was observed.

6 weeks postoperatively, the flap was covered by a healthy keratinized oral mucosa (Fig. 5) and a removable partial denture replacing the upper left central incisor was fabricated.

After 3 months, adequate local anesthesia was given and decortication of the bone (on the labial surface) at the recipient site was performed to allow progenitor cells easy access to a GBR-treated site and to facilitate prompt angiogenesis. It also may enhance the physical connection between a bone graft and a recipient site.

An autogenous (10mm*17mm) bone graft from the chin was prepared to be fixed at the site of osseous defect (Fig. 6). A fixation screw was placed to fix the bone graft in its position (Fig. 7).

Together with cancellous bone, Bio-oss bone graft was used to fill in the space between the cortical bone graft and the palatal aspect of the osseous defect. The bone graft was covered with absorbable membrane (Bioguide) and after releasing of the flap, the flap was secured and immobilized to the palatal mucosa over the bone graft and the absorbable membrane ensuring that it was not under tension.

The patient was given prophylactic antibiotics and a non-steroidal anti-inflammatory medication. The patient was instructed to rinse with Chlorhexidine (0.12%) mouth wash twice daily for 2 weeks. After the removal of sutures, a new removable partial denture was prepared.

Good tissue healing after bone graft with evidence of widened alveolar ridge was observed after 4 months of the operation. A good bone height was observed on OPG (Figs. 8, 9). The patient was given adequate amount of local anesthesia and a full thickness flap was reflected for the removal of the fixation screw and placement of a Tiolox® dental implant (Figs. 10, 11).

After 6 months, OPG showed good bone structure around the implant (Fig. 12).

Simple circular incision used to expose the implant and
Conclusion
With proper treatment, the healing of an endodontic lesion is highly predictable. However the prognosis of teeth with combined Periodontal and Endodontic lesions varies because each lesion contributes to the loss of attachment. Therefore the decision to treat and retain teeth with combined Periodontal and endodontic lesion should be carefully considered in regard to the overall dental treatment plan, because time and cost of combined defect treatment may be considerable and ultimately affect the prognosis.

References