

Retrograde Peri-Implantitis: A Case Report

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Abstract

Retrograde peri-implantitis is one of the implant complications when inflammation occurs around the fixture apex. The treatments of retrograde peri-implantitis mostly entail surgical debridement and antibiotic therapy. In this case report, we treated the apical lesion of the implant simply by nonsurgical root canal treatment with antibiotic therapy at the neighboring asymptomatic. The case report reveals that elimination of the possible predisposing factor from adjacent endodontic-treated tooth is much more conservative and may be the key to the success outcome.

Keywords: Retrograde peri-implantitis, implant complications

Introduction

The success rate of implants increases due to improved implant surface design and optimal implant surgery guidelines. The widely accepted criteria for implant success that were proposed by Albrektsson et al.¹ in 1986 are as follows: (1) an individual, unattached implant that is immobile when tested clinically; (2) a radiograph that does not demonstrate any evidence of peri-implant radiolucency; (3) vertical bone loss that is less than 0.2 mm annually subsequent to the implant's first of year service; (4) implant performance that is characterized by an absence of persistent and/or irreversible signs and symptoms such as pain, infections, neuropathies, paresthesia, or violation of the mandibular canal; and (5) a successful rate of 85% at the end of a five-year observation period and 80% at the end of a ten-year period within the context of the other criteria above. Due to the increasingly common utilization of implants, strategies to prevent implant complications have become a big issue among clinical practitioners.

Retrograde peri-implantitis is one of the implant complications that occur when inflammation occurs around the fixture apex. It is rarely discussed and there is no consensus on the management of retrograde peri-implantitis. According to a report by Zhou et al.², the incidence of retrograde peri-implantitis is 7.8%. Laird et al.³ showed that the success rate and survival rate of implants decrease when non-vital teeth are nearby. Possible etiologies of the periapical lesions of the fixtures are: (1) bacterial contamination from an extracted socket or neighboring remaining teeth; (2) close dis-

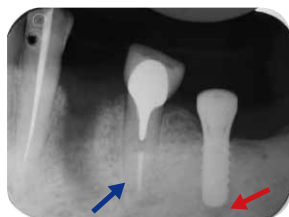


fig. 1 The lower left second premolar was endodontic-treated with asymptomatic apical lesion (blue arrow) and the lesion was noted at 36 implant apex (red arrow).

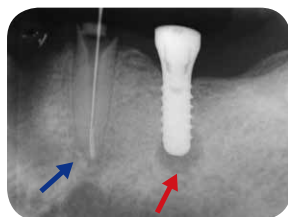


fig. 2 Tooth 35 was under non-surgical root canal treatment (NSRT) to exclude bacterial contamination of the implant from the adjacent tooth.



fig. 3 The NSRT of tooth 35 was then accomplished by the lateral compaction technique.

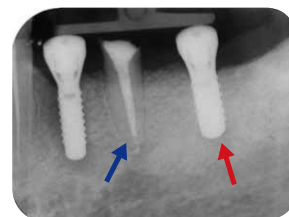


fig. 4 The periapical lesion of tooth 35 (blue arrow) and the implant area of 36 (red arrow) healed well without surgical intervention.



fig. 5 Six months follow-up after 36 implantation.



fig. 6 The implant is stable and functioning well.

tances between the fixture and the adjacent teeth; (3) bone necrosis due to overheating during implant site preparation; (4) implant insertion short of the prepared osteotomy site. Most treatments of retrograde peri-implantitis entail surgical debridement and surface treatment of the exposed portion with antibiotics. In this case report, the patient presented with retrograde peri-implantitis affected by the asymptomatic periapical pathology of adjacent teeth. After ineffective antibiotic therapy, we treated the retrograde peri-implantitis with nonsurgical root canal treatment at the neighboring tooth and cured the symptoms and apical lesion.

Case report

The patient, a 72-year-old male with hypertension under medical control, came to visit us for a full-mouth dental examination due to multiple missing teeth. Gingival swelling and pus formation were noted in the region of the lower left premolars. The lower left first premolar was extracted on February 4th, 2008, due to a vertical fracture, and the lower left second premolar was endodontically treated after an asymptomatic apical lesion was revealed on the x-ray film (fig.1). After the extraction of tooth 34, antibiotics (Amoxicillin, 500 mg 4

times daily for 7 days) were prescribed to control the inflammation.

While waiting for the tooth 34 area to heal, we placed an implant (ITI standard plus, SLA10 mm, 4.1 mm RN) at the lower left first molar edentulous area on July 3rd, 2008. Healing was uneventful during the first couple weeks; however, the patient started to complain of continuous pain at the implant site 1 month after the implant was inserted. The x-ray film (fig.1) revealed a developing apical lesion at implant 36. The percussion pain and palpation pain were positive in the implant 36 area but negative on tooth 35, and the pocket depth of later tooth was within normal limit. Amoxicillin (500 mg 4 times daily for 7 days) and metronidazole were prescribed, but the pain persisted. To prevent bacterial contamination of the implant from the adjacent tooth, tooth 35 was subjected to nonsurgical root canal treatment (NSRT) after the removal of the metal post and core (fig.2). Calcium hydroxide (as an interappointment dressing) and sodium hypochloride irrigating solutions were applied during NSRT. The symptoms and signs subsided right away, and the NSRT of tooth 35 was then accomplished by the lateral compaction technique with guttapercha and calcium hydroxide based sealer (Sealapex™ Root Canal

Sealer) (fig.3). The follow-up x-ray film showed that the periapical lesion at tooth 35 and the implant 36 area healed well without surgical intervention (fig.4). A periapical radiograph (fig. 5) taken 6 months after 36 implantation showed no significant radiolucency at apical region of 36 fixture. The implants were asymptomatic and appeared to be stable and functioning well (fig. 6).

Discussion

Implant-supported fixed dental prostheses (FDPs) are widely used due to their favorable long-term outcomes. The 5-year and 10-year survival rates of implant-supported FDPs are estimated to be up to 95.6% and 93.1%, respectively.⁴ Considering the biological and mechanical prosthesis designs, treatment plans with implants are the optimal option under many circumstances. Due to the increased utilization of implants, strategies to prevent implant complications have become a big issue among clinical practitioners.

Among various implant complications, one rarely discussed complication that occurs when inflammation occurs around the fixture apex is retrograde peri-implantitis. The potential causes to retrograde peri-implantitis vary. Laird et al.³ compared the success rate and survival rate of implants which are adjacent to vital teeth with those of implants which are adjacent to non-vital teeth. Even though the sample size is insufficient, the implant success rate and survival rate decrease when non-vital teeth are nearby, a finding which suggests that the conditions of neighboring teeth influence the success of implant surgery. Zhou et al.² showed that the incidence of retrograde peri-implantitis is 7.8%, and among the 10 cases of retrograde peri-implantitis in their study, 9 of the failed implants were adjacent to non-vital tooth. Furthermore, their report also mentioned that the greater the distance between the pulpless teeth and the failed implants, and the longer the duration from endodontic treatment to implant placement, the lower the incidence of retrograde peri-implantitis. In a retrospective study conducted by Quirynen et al.⁵, retrograde peri-implantitis was found to have occurred preferably at sites with a history of obvious endodontic pathology in the extracted tooth to be replaced. This seemed to indicate that the complication is provoked by remaining scar or granulation tissue at the recipient site. In conclusion, possible etiologies of the periapical lesions of the fixture are

varied and can be categorized as follows: (1) bacterial contamination from the extracted socket or neighboring remaining teeth; (2) close distances between the fixture and the adjacent teeth; (3) bone necrosis due to overheating during implant site preparation; and (4) implant insertion short in distance from the prepared osteotomy site.^{6, 7}

There is no consensus treatment for retrograde peri-implantitis. Some case reports have reported the use of surgical debridement and surface treatment of the exposed portion with antibiotics,^{7, 8} while others have reported a combination of implant removal and re-implantation.⁹⁻¹² The authors of most of those reports have indicated the belief that any infected implant should be removed as soon as possible to prevent osteomyelitis. However, as detailed in this case report, after ineffective antibiotic therapy, we treated the apical lesion of the implant simply by nonsurgical root canal treatment at the neighboring asymptomatic tooth rather than by surgical intervention, an approach which is much more conservative. The key to the successful outcome seemed to be the possible predisposing factor of the elimination of the adjacent endodontically treated tooth. This case report may be the first in which a conservative approach was used to treat retrograde peri-implantitis and can thus serve as a reference for the treatment of retrograde peri-implantitis.

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