

Retrograde Peri - Implantitis: A Clinical Case Report

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Abstract: *Retrograde peri - implantitis describes a lesion that is periapical to an osseointegrated implant and is not very common, but threatens seriously the implant survival. It is usually diagnosed symptomatically with pain, tenderness, swelling, and the presence of the fistulous tract. If the fixture is stable despite bone loss in the periapical region, it is suggested that surgical debridement be carried out with the use of a surface antiseptic like chlorhexidine. The current article briefly reviews the literature on this subject and presents a case report of retrograde peri - implantitis.*

Keywords: Implants, Retrograde peri - implantitis

1. Introduction

Periodontal disease is defined as a chronic infection in which the pathogenic microorganisms initiate the host immune response leading to the destruction of tooth supporting tissue and eventually tooth loss. Dental implant placement is a standard and most accepted treatment modality for replacing single or multiple missing teeth.¹

Although dental implants have a high success rate, there is a risk of developing complications that can lead to implant failure.² Implant failure is defined as the total failure of an implant to fulfill its purpose (functional, esthetic, or phonetic) because of mechanical or biological reasons.³ Biological complications comprise peri - implant diseases such as peri - implant mucositis, peri - implantitis, and retrograde/apical periimplantitis.

Retrograde peri - Implantitis (RPI) is defined as a clinically symptomatic periapical lesion which is diagnosed as a radiolucency that develops shortly after an implant insertion, in which the coronal portion of the implant achieves a normal bone-implant interface.⁴ This condition was first described by McAllister et al.⁵

Sussman⁶ proposed 2 pathways that may lead to RPI: Type 1 (implant to the tooth) and type 2 (tooth to the implant). Type 1 RPI occurs when the osteotomy preparation causes direct or indirect damage to the adjacent tooth, resulting in devitalization of the tooth pulp and the periapical pathology. Subsequently, the periapically infected tooth inhibits the osseointegration of the implant. Type 2 RPI occurs when an adjacent tooth with a periapical pathology contaminates the fixture and interferes with the osseointegration of the implant.

Retrograde peri - implantitis is not a common sequel of dental implant failure, but it has a prevalence of 1.6% in

upper teeth and 2.7% in lower teeth, before abutment connection.⁷

The etiology of retrograde peri - implantitis has been subject to speculation, and the following are proposed by different authors as the likely causes: (1) insertion of implant short of the prepared osteotomy site,⁸ (2) bone necrosis due to overheating at the time of drilling for implant site preparation, (3) contamination of implant surface from periapical lesions around adjacent teeth,^{6,9} and (4) infection developing due to activation of residual bacteria in sites with a history of failed endodontic procedures and periapical surgery¹⁰

2. Case Report

A 35 - year - old male patient reported to the Department of Periodontology at College of dental sciences and research centre, Ahmedabad with a chief complain of missing teeth in lower left posterior region. On examination, tooth 36 and 37 were found to be absent. (Fig 1) The patient reported no systemic medical or dental history except extraction of carious teeth 36 and 37 couple of years back. The patient was given the option of a fixed partial denture, removable partial denture and a dental implant. The patient opted for the treatment with a dental implant in relation to 36 and 37. The implant placement was planned and osstem implants of size 3.5×11.5 and 4×11.5 were placed at sites 36 and 37 respectively. (Fig 2, 3) Primary closure was achieved while implant was allowed to osseointegrate by submerged healing protocol. At the time of suture removal, patient complained of mild pain sensation in the implant placement area [36] and area adjacent to it [35]. After clinical examination, the patient was referred to the department of endodontics and conservative dentistry where a pea sized peri - apical lesion was detected in the area adjacent to implant placement - [35]. Thus, patient was kept on medications and root canal therapy was advised.

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After the biomechanical preparation of the root canal therapy, time equivalent to one month after the stage 1 implant surgery, the patient presented with a moderate pain sensation and swelling in the area of implant placement [36] and site adjacent to it [35]. No sinus tract or fistula was detected clinically but a purulent exudate was detected on probing the swelling clinically. (Fig 4) Vitality of tooth [35] was confirmed and found to be positive. A periapical radiograph of the region revealed an ovoid radiolucency at the apical region of the implant and obvious signs of bone loss were evident in the region of implant placement [36] while no bone loss was observed in region of implant placement [37] and healing was satisfactory there. (Fig 5) The condition was diagnosed as likely to be retrograde peri-implantitis; hence, exploratory surgery was planned and full-thickness buccal and lingual flaps were reflected to visualize the area. The whole area was filled with granulation tissue, which was thoroughly cleaned and debrided and any contact with the implant surface was avoided. (Fig 6) Tissue tags that were attached to the implant surface were then removed with titanium curettes. Once the implant surface was visibly free of any debris and tissue tags, it was washed with copious saline and chlorhexidine and dabbed with saline-soaked gauze. No mobility of the fixture was detected and hence, colocal graft was placed and the area was packed with the help of a periodontal dressing. (Fig 7) After this, the respective site was allowed to heal by primary intention and the patient was prescribed amoxicillin 500 mg three times daily for 1 week and chlorhexidine mouthwash for 2 weeks. The root canal therapy was continued and completed since the healing was uneventful as seen after two weeks. Regular follow-ups were scheduled for 3 months to check the progress in osseointegration. At the end of three months, radiograph also showed good bone fill of the periapical lesion and the fixture was firm and stable and hence the stage 2 surgery was carried out. (Fig 8) Henceforth, the tooth was restored with a permanent crown. (Fig 9, 10)



Figure 4

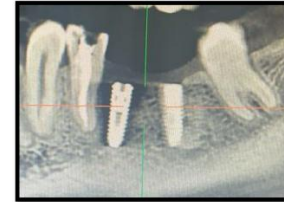


Figure 5

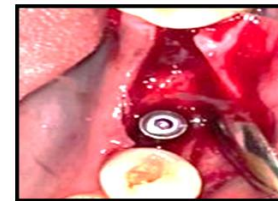


Figure 6



Figure 7



Figure 8



Figure 9



Figure 10



Figure 1

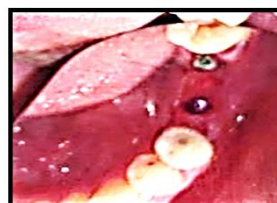


Figure 2



Figure 3

3. Discussion

The current case report describes the management of a case of retrograde peri - implantitis. The occurrence of retrograde peri - implantitis seems to be quite low as evidenced by only few reports on this topic. In this case, although area [46] had developed retrograde peri - implantitis [47] did not show signs of the condition, thus, we considered that the presence of an adjacent endodontic lesion as the source of implant infection might not have been the only cause because of the successful implant in area 46. There was no indication of biocompatibility issues with the implant, as there were no residual root fragments or foreign bodies present in the bone.

The etiology of this condition is not very clear, but it seems less likely that the lesion develops solely as a result of residual bacterial infection at the site of implant placement. In the opinion of the authors, heat generation during implant site preparation and the placement of self - tapping implants causing excessive pressure on the residual bone may result in bone necrosis. This site may subsequently become infected by the residual bacteria present in the bone.

Another case report on a lesion similar to the one described here attempted to treat the condition with systemic antibiotics, but no improvement was observed. It is important to mention that systemic antibiotics may not be the most appropriate choice; rather, it is more prudent to perform local debridement and remove chronically inflamed or infected tissue. Surgical debridement also has the additional advantage of allowing the undertaking of procedures to regenerate the bone.¹¹ Some authors have argued that the scratching of the implant surface in such a location may not be crucial.¹⁰ However, in view of the difficulty in achieving reosseointegration, it is important that surface alterations be minimized to maintain an osteophilic surface for reattachment of osteoblasts. Surface decontamination of the implant surface with tetracycline is also reported in the management of retrograde periimplantitis;¹⁰ however, this may be of no additional advantage over saline and chlorhexidine irrigation.¹² The fear of damage to the surface layer of the fixture also stays with the use of tetracycline paste.

4. Conclusion

Although many articles have reported high success rates for surgical treatment of retrograde peri - implantitis, there has been no scientific validation of such procedures. It is proposed that retrograde peri - implantitis may be a result of bone necrosis caused by excessive heat generation during implant site preparation or may be due to the placement of oversized implants, and the source of bacteria may be from residual infection from the bone site with a history of failed endodontic procedure. A need for careful surface debridement of the implant surface under surgical vision and access and decontamination are emphasized. Recently, various treatment strategies have been used for the management of retrograde peri - implantitis, including debridement alone, a combination of debridement and grafting material with or without membrane, detoxification of the infected implant surfaces, and apicoectomy.¹³ In

addition to the various treatments available, regular follow - ups could improve the prognosis for patients.

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