Case Report

An Unusual Bone Loss Around Implants

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Abstract

Pre-implant disease is an inflammatory process that affects the surrounding tissues of a functional osseointegrated implant. It is usually the result of a disequilibrium between the micro-flora and the defense system.
This case reports a 57-year-old man with unusual bone loss around dental im plants.
This was an unusual case of peri-implantitis that occurred only in the implants on one side of the mouth although they were all unloaded implants.

Key Words: Bone loss; Implant Complication; Periimplantitis

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INTRODUCTION

In the current century, dental implant companies have estimated that more than two million implants are placed each year and this number will increase annually. Implant treatment is now considered a common method of reconstruction of all or a part of edentulous jaws [1]. The dental implant abutment, which is similar to natural teeth, is exposed to the oral cavity and may be contaminated by oral microbiota. Microbial plaque can form on the implant surface and the surrounding tissues react to the presence of bacteria resulting in inflammation [1]. Pre-implant disease is an inflammatory process that may affect the surrounding tissues of a functional osseointegrated implant. It usually results from disequilibrium between micro flora and the body's defense system. Pre-implant disease may only involve the soft tissue around the implants that is called pre-implant mucositis or pre-implantitis when the supporting bone around the implant is also involved [2].
Early and accurate diagnosis of these diseases is important for their treatment. Bleeding on probing (BOP) is usually seen in pre implant diseases. Other signs are pus, increased probing depth, gingival recession, sinus track, inflation and hyperplasia of the tissues surrounding the implant.
If not diagnosed on time, pre implant disease can lead to full loss of osseointegration. In pre-implantitis, a bony lesion is formed in the marginal part of the implant, but the apical part of the implant-bone is left untouched before the lesion reaches this part [3].

Over all, there is little information about the prevalence of pre implant diseases. The disease progression and its patterns are also unknown. Because of the site specificity of this disease and its relation with implant design and surface texture, the prevalence of pre implant disease varies in different implant systems [1]. In a study conducted by van Steenberghe et al., the prevalence of late fixture loss was higher in patients with higher plaque accumulation [4]. In other studies, cluster implant loss was higher in patients with greater risk factors. Prospective studies have shown that the prevalence and incidence of radiographic bone loss is different in patients and is related to the history of previous periodontal disease, previous bone loss, smoking, plaque accumulation, poor oral hygiene and systematic diseases. Many treatments have been proposed for pre implant diseases and reconstruction of pre implant tissues, such as, scaling, flap surgery, debridement of implant surface, chemical conditioning of the implant surface, bone regeneration and prescription of local and systemic antibiotics [5].

CASE REPORT

The patient was a 57-year-old man who had lost his teeth because of caries, and had been referred to the dental school of Tehran university to replace them by implants in 2005. He had a history of controlled high blood pressure and controlled diabetes. Clinical examination showed that teeth number 18, 19, 30 and 31 had been lost. A comprehensive treatment plan was given to the patient and he was first referred for endodontic, periodontal and restorative treatment of the remaining teeth, and then for placement of dental implants.

Implant surgery was preformed under local anesthesia (2% lidocaine, 1:100000 epinephrine). On the right side of the mandible, two Replace Select wide platform implants (10mm × 5mm), were placed in teeth 30 and 31 positions. A 10mm × 4.3mm Replace Select regular platform implant was placed in tooth number 19 position on the left side of the mandible and for position 18, a Replace wide platform implant (10mm × 5mm) was inserted.

There were no complications during implant placement. The type of bone in the implant areas was type 1.

A post-operative antibiotic regime of 500mg amoxicillin was prescribed three times daily for 7 days, 400mg gelofen 4 times a day for 3 days and a chlorhexidine mouth rinse 2 times a day for 14 days was also prescribed for the patient. The sutures were removed 10 days later. After initial healing and taking a panoramic radiograph an appointment was set for the patient for impression taking, but he did not refer until 6 years later, in 2011, to continue the treatment. After clinical examination, the implants on the left mandibular side were healthy, BOP was negative without suppuration, with a pocket depth of 2 to 3 mm and without a radiographic sign of bone loss. However, on the right mandibular side, implants 30 and 31 had 7 to 9 millimeter pockets, respectively and were BOP and suppuration positive. Wide crater-like lesions were seen on radiographic images around both implants (Fig 1). Scaling was performed and after 2 weeks open flap surgery was carried out in the involved area.. A sulcular incision was made from the distal area to the mesial of tooth number 28 with a #15 blade. A sulcular incision was made from the distal area to the mesial area of tooth number 28 with a #15 blade. All around the implants were debrided. Then the implants were taken out and the remaining sockets were decorticated with a round bur and grafting material was placed (0.5 gr bio-oss large particle) in the area and covered by a membrane (bio guide 25 × 25mm) by a saddle shape technique. The flap was coronally replaced and sealed with a horizontal mattress and figure-c sutures (silk 3-0). After surgery, 500mg amoxicillin three times daily for 7 days and also 400mg gelofen 4 times a day for 3 days and a chlorhexidine mouth rinse 2 times a day for 2 weeks was prescribed.

Fig 1. Panoramic view of patient after 6 years of implant surgery

DISCUSSION

A prevalence of 8-44% for pre-implant mucositis and 1-19% for pre-implantitis has been reported. It is actually not easy to report the prevalence of such diseases since there have been different prevalence reports with different systems and only a few articles have been published with similar criteria [6].

Clinical signs of pre-implantitis are inflammatory lesions in the mucosa and bone-loss around the implant. Pre-implantitis occurs with bleeding on probing and radiographic bone loss. Inflammation, redness and suppuration may also accompany these signs (pus is a common finding).

In advance cases, further bone loss can cause implant mobility. The morphology of the mucosa surrounding the implant and the position of the implant may affect the signs of inflammation in pre-implantitis; therefore, probing, including determination of probing depth and BOP, is a prerequisite for diagnosis in this disease [7]. The lesions are usually seen as craters in radiographs and bone loss around the implants are usually symmetric and equal amounts of bone is lost in the mesial, distal, buccal and lingual sides of the implant, but the overall morphology of the bony lesion may vary depending on the horizontal dimension and thickness of the ridge.

Therefore, in wide buccolingual ridges the buccal and lingual bone will still remain in pre implantitis and in narrow ridges it will be resorbed [7].

Causes of pre-implantitis may be poor oral hygiene smoking, history of periodontitis, diabetes, genetic factors, alcohol and the implant type [8]. De Bruyn et al. showed that there is a strong relationship between smoking and pre-implantitis [9].

In one study, a strong relationship between a history of periodontal disease and bone loss around the implant was reported. A greater PPD and greater attachment loss in a person can be prognostic of a greater bone loss around the implants.

In subjects with a history of previous periodontal disease, the prevalence of pre- implantitis is 4-5 times greater than people without such a history [10]. In this patient, on the right side of the mandible, the pre implant mucosa was inflamed, the PPD around the implants was 7-9 mm and BOP and suppuration were also seen, while on the left side none of these signs were found. There was a radiographic wide crater-like bone loss in the right implants, whereas no sign of bone loss was seen on the left side.

The occurrence of pre implantitis after successful osseointegration can be as a result of

imbalance between microbes and the body's defense [11], but in this patient this can not be an acceptable reason, since the implants on the left side were completely healthy.

In a study conducted by Misch et al., prosthetic overload was mentioned as a reason for pre implantitis, but in our patient none of the implants were loaded, so this probability will also be ruled out. Poor oral hygiene, smoking, previous periodontal disease and the amount of bone loss are factors that have an equal effect on both sides and therefore cannot explain this deference in bone loss [8].

Misch et al. have reported that the amount of bone density may be one of the reasons for implant success. According to zarb's classification, there are four types of bone quality; D1 has a dense cortical structure, D2 is cortical porous, D3 has a thin cortical layer with fine trabeculae in the center, D4 is almost completely made of fine trabeculae.

The D1 bone is never seen in the maxilla and rarely seen in the mandible (3% in the posterior mandible and 6% in the anterior). D2 bone is found in the anterior and posterior mandible, D3 is found in the posterior mandible and anterior maxilla and D4 is often seen in the posterior maxilla.

If bone strength is considered as a 1-10 scale; D1 will be 9-10; D2, 7-8; D3, 3-4; and D4, 1-2; therefore, the bone density of D4 is almost 1:10 of D1 [8].

Hämmerle et al. found that 78% of all reported failures of implants were in soft bones [12].

It was reported that a low bone density in the oral cavity increases the possibility of implant failure [13,14]. Most failures in implants placed in D1 bone were because of lack of osseointegration as a result of high temperatures during drilling or absence of bleeding. But after successful osseointegration, failure in D1 bone is much less than the other bone types [8]. In this patient during implant placement on the left side, bleeding was seen but the surgeon mentions that on the right side there was no bleeding during drilling.

This difference in the bone type of the area and its amount of blood supply may be a reason for perimplantitis on the right side. It is important to mention that clinical failure of implants usually occurs in lower bone densities and implants that are under load and function. In this patient, none of the implants were under functional or loaded.

Remaining pre-apical lesions after tooth extractions on the right side might also be considered as another reason. the above mentioned reasons still do not seem convincing for this case.

CONCLUSION

This was an unusual case of peri-implantitis that occurred only in the implants on one side of the mouth. Even though they were all unloaded implants.

Any opinions or comments about this unusual case will be appreciated.

REFERENCES

1- Klinge B, Hultin M, Berglundh T. Peri-implantitis. Dent Clin N Am. 2005 Jul;49(3):661-76.

2- Mombelli A, Lang NP. The diagnosis and treatment of peri- implantitis. Periodontol 2000. 1998 Jun;17:63-76.

3- Heitz Mayfield LJ. Peri- implant diseases: diagnosis and risk indicators. J Clin Periodontol. 2008 Sep;35(8 Suppl):292-304.

4- van Steenberghe D, Klinge B, Linde´n U, Quirynen M, Herrmann I, Garpland C. Periodontal indices around natural and titanium abutments: a longitudinal multicenter study. J Periodontol. 1993 Jun;64(6):538-41.

5- Karoussis IK, Salvi GE, Heitz-Mayfield LJ, Brägger U, Hämmerle CH, Lang NP. Long-term implant prognosis in patients with and without a history of chronic periodontitis: a 10 year prospective cohort study of the ITI dental implant system. Clin Oral Implant Res. 2003 Jun;14(3):329-39.

6- Roos Jansåker AM, Renvert S, Egelberg J. Treatment of peri implant infections: a litera-

ture review. J Clin Periodontol. 2003;30(6):467-85.
7- Mombelli A, Lang N. (1998) The diagnosis and treatment of peri-implantitis. Periodontology. 2000;17:63-76.
8- Misch CE. Contemporary implant dentistry: Mosby; 2007.
9- De Bruyn H, Collaert B. The effect of smoking on early implant failure. Clin Oral Implants Res. 1994 Dec;5(4):260-4.
10- Norowski PA, Bumgardner JD. Biomaterial and antibiotic strategies for peri implantitis: a review. J Biomed Mater Res B Appl Biomater. 2009 Feb;88(2):530-43.
11- Sharaway M, Misch C. Spread of dental Infection in the head and neck. In: Misch CE, editor. Contemporary implant dentistry. St. Louis: Mosby; 1993. p. 355-68.
12- Hämmerle CH, Jung RE, Feloutzis A. A systematic review of the survival of implants in bone sites augmented with barrier membranes (guided bone regeneration) in partially edentulous patients. J Clin Periodontol. 2002;29 Suppl 3:226-31.
13- Jaffin RA, Berman CL. The Excessive Loss of Branemark Fixtures in Type IV Bone: A 5-Year Analysis. J Periodontol. 1991 Jan;62(1):2-4.
14- Martinez H, Davarpanah M, Missika P, Celletti R, Lazzara R. Optimal implant stabilization in low density bone. Clin Oral Implants Res. 2001 Oct;12(5):423-32.