International Journal of Dental Sciences and Research, 2015, Vol. 3, No. 4, 107-110
Available online at http://pubs.sciepub.com/ijdsr/3/4/6

DOI:10.12691/ijdsr-3-4-6

Implant for Posterior Molar with Parafunctional Habit; Cautious Approach

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Received July 06, 2015; Revised August 09, 2015; Accepted August 17, 2015

Abstract Bruxism is generally considered a clinical problem, which may be detrimental consequences for dental, periodontal and musculoskeletal tissues.Bruxism has also been suggested to cause excessive occlusal overload of dental implants and their superstructures, which may result in bone loss around dental implants or even in implant failure. Not surprisingly, bruxism is therefore often considered a contraindication for implant treatment, although evidence for this is usually based on clinical experience only. So far, studies to the possible cause and effect relationship between bruxism and implant failure do not yield outcomes. This is partly because of large variation in the consistent and specific literature in terms of both the technical aspects and the biological aspects of the study material. It has been documented that occlusal parafunction and lateral contacts determines the outcome of implant prosthesis. But there is no evidence for casual relation between the failures and overload of dental implants. The purpose of this report is to present an occlusal scheme, occlusal material and clinical approach for prevention of complication related to parafuntional habits.

Keywords: *implant, parafunctional habit, Prosthesis, night gaurd*

Cite This Article: Farhan Durrani, "Implant for Posterior Molar with Parafunctional Habit; Cautious Approach" *International Journal of Dental Sciences and Research*, vol. 3, no. 4 (2015): 107-110. doi: 10.12691/ijdsr-3-4-6.

1. Introduction

Bruxism (Teeth grinding and clenching) is generally considered a contraindication for dental implants, although evidence is based on clinical experience only. So far studies to the possible cause and effect relationship between bruxism and implant failure do not yield consistent and specific outcomes. Although there is no proof that bruxism causes an overload of dental implants and their superstructures, a careful approach is recommended. There are few practical guidelines as to minimize the chance of implant failure. This report highlights an interesting case of bruxism with its management of missing teeth with a dental implant. Finally, a set of practical guidelines is given for clinicians who have indicated a treatment with dental implants in patient with bruxism.

2. Case Report

A 56 year old woman visited the Faculty of dental sciences, Institute of medical science, Banaras Hindu University for replacement of missing mandibular first molar. Oral examination revealed dark tobacco stains on most of the teeth, with wear on the occlusal surfaces of posterior teeth (Figure 1).

Figure 1. Wear Evident on occlusal surfaces of teeth

There was no loss of vertical dimension and the pathway for envelope of function seems adequate (Figure 2).

Figure 2. Envelope of function Adequate

Patient reported teeth sensitivity with jaw soreness especially in the morning. The medical history was unremarkable with no drug allergies. She was informed of all the viable options to replace her missing molar and a detailed written description of the risks and benefits of proposed treatment followed by a written consent – to treatment agreement. The investigations included an intraoral periapical radiograph, orthopantomograph (Figure 3), routine complete haemogram and computed tomography. The CT scan revealed the bucco –lingual cortical bone width of 7 mm. The mean bone density at the proposed site was evaluated as D3 bone in Hounsfield units as per Misch"s criteria.

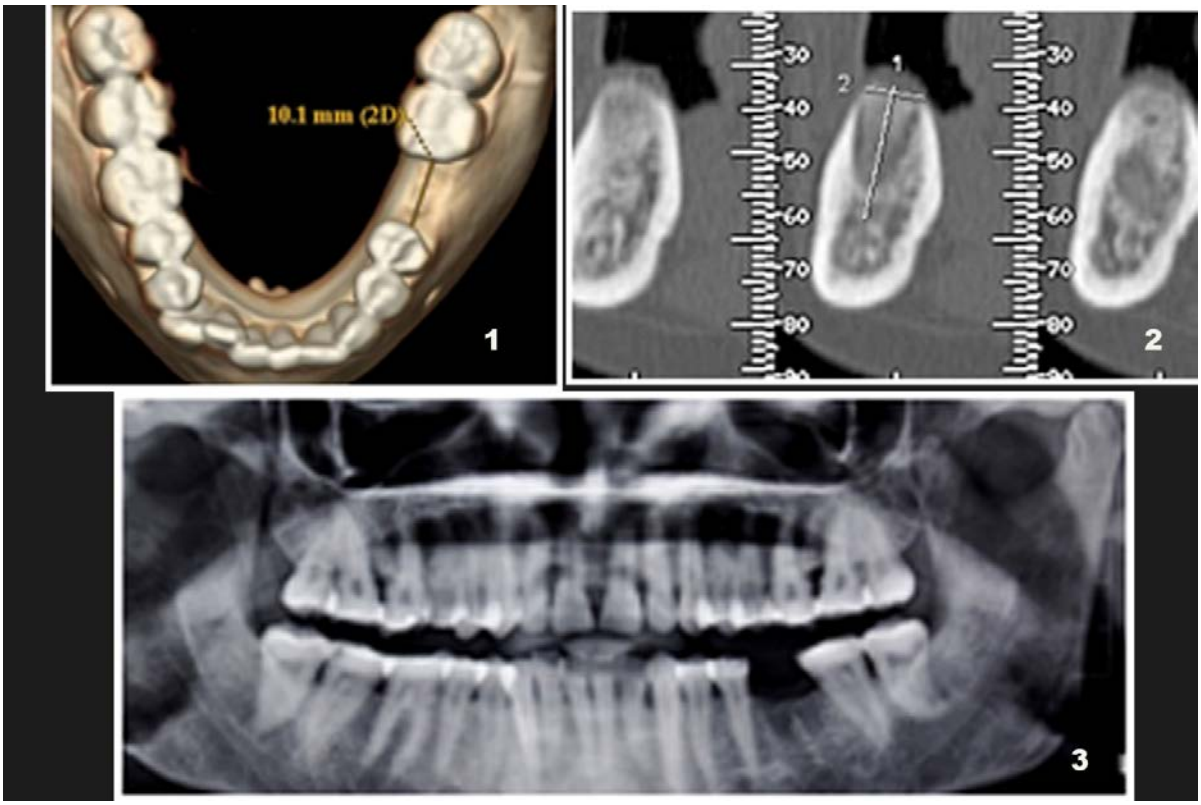

Figure 3. Pre Surgical Planning OPG,CT and 3D view

On the day of surgery, patient was made to rinse with 10 ml of 0.2 % of Chlorhexidine gluconate solution followed by extra oral rubbing with 5% Povidine iodine solution.Under right inferior alveolar nerve block, a midcrestal combined crevicular incisions were given on the implant site to elevate a mucoperiosteal flap.The osteotomy was started with the initial pilot drill and sequentially deepened with subsequent diameter drills.The speed was adjusted at 1300 rpm at the initial drill with an intermittent pressure of 1 second on the bone and 1 to 2 seconds off the bone under copious irrigation of sterile saline. Internal hex implant of Leader Italia was chosen with dimension 4.5mm/12 mm, removed from the sterile vial and installed at a speed of 25 rpm such that no threads are visible outside the bone crest. After confirming the primary stability with hex driver engaged into the cover screw, 4-0 Ethicon sutures were used for primary closure. After six months of healing the prefabricated abutment was prepared directly in the mouth for the prosthesis on the implant. The prosthetic rehabilitation of metal occlusal crown had a single point contact as close to the center of the implant as possible. Articulation was characterized by flat incline planes of the cusps as to protect the implant system against the lateral components of the forces that are exerted during teeth grinding. (Figure 4) A hard stabilization splint for nightly use was advised which further contributed to optimally distributing, and vertically redirecting, the forces that go with nocturnal teeth grinding and clenching.

Figure 4. Metallic Crown with lateral movement of Mandible

3. Discussion

According to available literature, the density and strength of the bite force in bruxers was higher than in

nonbruxers. It was reported that maximal bite force value 105.1±34.2 N in bruxism group, while it was 81.3±31.0 N in non bruxer group in incisor area. [1] Meanwhile, in the molar region, higher bite force and longer duration of bruxism events were observed. [2,3] Therefore, overload may occur easily in bruxers. On the other hand proprioception around dental implants and the proprioceptive feedback mechanisms to the jaw closing muscles were limited due to lack of periodontal ligament around dental implants. [4,5] This phenomenon could cause technical complications, such as porcelain chipping, screw implant loosening, screw implant fracture and losing of retension/implant. [6,7] Further overload may cause imbalance of bone remodeling and absorbtion, which finally leads to biological complications (marginal bone loss peri-implantitis) [8,9].

These findings may lead to contraindication of dental implant treatment for teeth grinders. Although the evidence is usually based on clinical experience only. So far, studies to the possible cause and effect relationship between bruxism and implant failure do not yield consistent and specific outcomes [10]. Implant fracture is considered a rare complication, however there are several causative factors that may lead to it. Biomechanical overload, inappropriate seat of superstructure, in – line arrangement of the implants, leverage, heavy occlusal forces (bruxing, clenching), location of implant and the size of the implant or metal fatigue. This can be reduced by good clinical examination and correct treatment plans [11]. Manfredini et al [12], discussed current concepts about aetiology, diagnosis and treatment of bruxism as well as its impact on dental implants. The aim was to formulate adequate clinical suggestions, based on scientific evidence gathered in a literature review. However, the authors noted that little is known about the biological and biomechanical effects of dental implantation treatment in bruxism. In addition, they suggested the lack of available data is the result of specialist's opinion, rather than based on scientific evidence.

Evidence from current reviews suggested that the cause and effect relationship between bruxism and dental implant failure remained controversial. [13,14] In addition to this some review studies recommended that bruxism was not the major or unique cause but a contributing factor for causing dental implant failure. In another tooth implant supported zirconium ceramic restorations study core fractures and veer chippings were higher in patients with bruxism signs [15]. Unavoidable limitations in the design and implementation of some studies suggest the likelihood of bias. Firstly clinicians should have a correct diagnosis of bruxism and determine the type of bruxism (wakeful or nocturnal). Researchers recommend to place more implants in proper position in order to reduce the overload and longer implant with larger diameter would increase the implant bone surface area. [13] Further functional cusps have occlusal contacts, inclined planes should not touch, lateral excursion should be discouraged. [14] Prosthetic crown size should be reduced with metal occlusal surface if possible [17]. If patient suffered from nocturnal bruxism, night guard occlusal stabilization maybe useful for reducing the occurrence of dental implant complications. [18] Thus as suggested by Hartshorne etal [19],clinicians should adopt a cautious approach based on measures that can assist in reducing the harmful effects of occlusal forces that are developed and transmitted to peri – implant bone and implant assisted prostheses during tooth grinding and tooth clenching. Measures should be taken in consideration are surgical (bone quality, number, size and position of implants), prosthetic (timing of loading, flatter cuspal planes, greater freedom of movement at the occlusal contact areas, splinting and avoiding cantilevers and non axial loads) and preventive (use of hard protective occlusal splint during night time) aspects of implant therapy.

Thus in our report, patient treatment protocol followed all guidelines recommended by several authors mentioned in the review. The prosthesis for the implant was of metal occlusal crown with flat planes and reduced steepness,narrow occlusal table, devoid of eccentric contacts and slight contact in centric occlusion in excursions of mandible. Night time wear of hard splint was reinforced, with advice for reduction of grinding. The patient underwent the treatment five years back and is on regular follow up. There had been no complication till date, not even decementation of crown. Thus bruxism or tooth grinding cannot be a contraindication for dental implant treatment but again a proper diagnostic and cautious approach is required and long term study with large sample size is needed. Bruxism habit was evaluated regularly by checking the condition of the splint. It is very hard to ascertain the discontinuation of the habit because of sometimes improper follow up, but the presence of crown and implant in the mandible definitely gives an impression that is bruxism may not be a contraindication for oral implantation.

4. Conclusion

Bruxism is generally considered a contraindication for dental implant failure, although evidence for this is usually based on clinical experience. This is partly because of large variation in the literature in terms of both technical aspects and the biological aspects of the study material. Nevertheless, given the seriousness of the possible biological and biomechanical complications, careful presurgical planning and post prosthetic preventive measures should be given consideration in Bruxists.

In other words: there is no reason to assume otherwise than that bruxism is mainly regulated centrally, not peripherally, and that there is still insufficient evidence to support or refute a causal relationship between bruxism and implant failure. This illustrates that there is a vast need for well-designed studies to both the aetiology of bruxism and to its purported relationship with implant failure. Evidence-based information about these subjects would be welcomed in the dental clinic, where the causes and consequences of bruxism still frustrate (and fascinate) dentists. Few articles have evaluated, tough retrospective, prospective or experimental studies, the biological and biomechanical impact of bruxism on implant supported prostheses. As a consequence, there isn´t much material to provide specialists with examples and safety margins from a clinical perspective when performing dental implantation treatment. It can also be noted that the body of knowledge on the subject does not present a broad consensus based on scientific evidence.

References

[1] Dıraçoğlu D, Alptekin K, Cifter ED, Güçlü B, Karan A, Aksoy C. Relationship between maximal bite force and tooth wear in bruxist and non-bruxist individuals. Arch Oral Biol. 2011 Dec; 56(12):1569-75.

[2] Nishigawa K, Bando E, Nakano M. Quantitative study of bite force during sleep associated bruxism J Oral Rehabil. 2001 May; 28(5):485-91.

[3] Lantada AD, Bris CG, Morgado PL, Maudes JS. Novel system for bite-force sensing and monitoring based on magnetic near field communication. Sensors (Basel). 2012;12(9):11544-58.

[4] Lobbezoo F, Brouwers JE, Cune MS, Naeije M. Dental implants in patients with bruxing habits. J Oral Rehabil. 2006 Feb; 33(2):152-9.

[5] Hämmerle CH, Wagner D, Brägger U, Lussi A, Karayiannis A, Joss A, Lang NP. Threshold of tactile sensitivity perceived with dental endosseous implants and natural teeth. Clin Oral Implants Res. 1995 Jun; 6(2):83-90.

[6] Brägger U, Aeschlimann S, Bürgin W, Hämmerle CH, Lang NP. Biological and technical complications and failures with fixed partial dentures (FPD) on implantsand teeth after four to five years of function. Clin Oral Implants Res. 2001 Feb; 12(1):26-34.

[7] Askary AS, Meffert RM, Griffin T. Why do dental implants fail? Part II. Implant Dent. 1999; 8(3):265-77.

[8] Lobbezoo F, Van Der Zaag J, Naeije M. Bruxism: its multiple causes and its effects on dental implants - an updated review. J Oral Rehabil. 2006 Apr; 33(4):293-300.

[9] Niznick GA. Bending overload and implant fracture: a retrospective clinical analysis. Int J Oral Maxillofac Implants. 1996 Jul-Aug; 11(4):431-2.

[10] Lobbezoo F, Brouwers JE, Cune MS, Naeije M. Dental implants in tooth grinders. 2004 Mar; 111(3):85-90.

[11] Tagger-Green N, Horwitz J, Machtei EE, Peled M. Implant fracture: a complication of treatment with dental implants--review of the literature. Refuat Hapeh Vehashinayim. 2002 Oct;19(4):19-24, 68.

[12] Daniele Manfredini, Marco Brady Bucci, Vincenzo Bucci Sabattini,Frank Lobbezoo. Bruxism: overview of current knowledge and suggestions for dental implants planning Cranio: the journal of craniomandibular practice 10/2011; 29(4):304-12.

[13] Lobbezoo F, Brouwers JE, Cune MS, Naeije M. Dental implants in patients with bruxing habits. J Oral Rehabil. 2006 Feb; 33(2):152-9.

[14] Niznick GA. Bending overload and implant fracture: a retrospective clinical analysis. Int J Oral Maxillofac Implants. 1996 Jul-Aug; 11(4):431-2.

[15] Mundt T, Heinemann F, Schankath C, Schwahn C, Biffar R. Retrospective and clinical evaluation of retrievable, tooth-implant supported zirconia-ceramic restorations. Acta Odontol Scand. 2013 Sep; 71(5):1326-34.

[16] Sarmento HR, Dantas RV, Pereira-Cenci T, Faot F. Elements of implant-supported rehabilitation planning in patients with bruxism. J Craniofac Surg. 2012 Nov; 23(6):1905-9.

[17] McCoy G. American Academy of Implant Dentistry meetings.J Oral Implantol. 2013 Jun; 39(3):406.

[18] Misch CE. The effect of bruxism on treatment planning for dental implants.Dent Today. 2002 Sep; 21(9):76-81.

[19] Johan Hartshorne. Does bruxism contribute to dental implant failure? International Dentistry African Edition. Vol 5, No 3.