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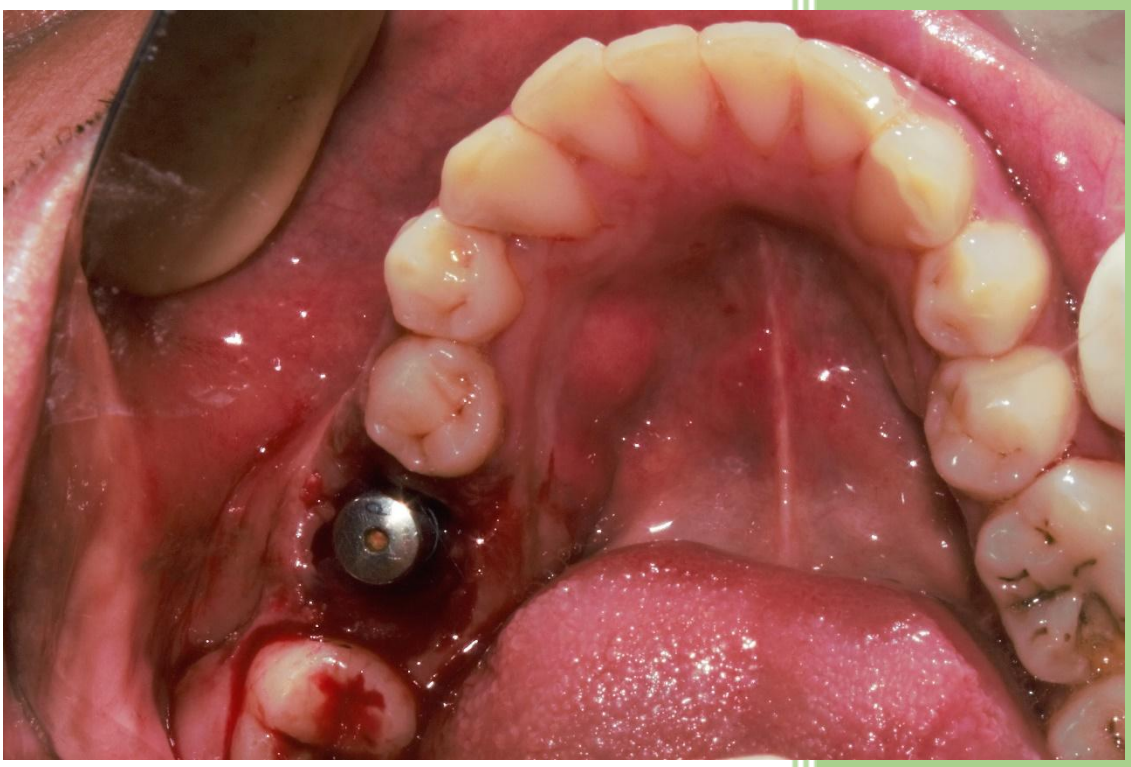

EDITOR:

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EDITORIAL

Short implants: are they beneficial?

Implant dentistry is an everyday treatment modality today. With a strong evidence base and growing popularity of implants, there is little doubt over why implants are always the preferred choice of treatment for replacing missing tooth or teeth. Advent of newer designs also paved way for newer dimensions in implants which led to usage of short implants in atrophied jaws which were earlier not recommended to be replaced with implants.Short implants are manufactured for use in atrophic regions of the jaws. Although many studies report on short implants as ≤10 mm length with considerable success, not much evidence is available regarding ultra-short implants of < 8mm length and their long term clinical success.Owing to the need for rehabilitation of such increasing number of atrophic jaws, the 7-mm standard implant was introduced in 1979. From the beginning, this implant was used either alone or in conjunction with longer implants in edentulous jaws, but, eventually, it was used in the treatment of partial edentulism as well. When considering these implants in function, the 1-, 3-, 5- and 10-year results showed a lot of failures among the short implants. In addition, to facilitate the replacement of a failing standard implant and to improve the success rate in compromised situations, wide-diameter implants were introduced. The wide-diameter implant was first introduced to fulfill two indications: poor bone quality and/or quantity and replacement of a failing standard implant. Some authors have found that wide-diameter implants were successful when the length of the implant was compromised for situations where residual alveolar height was less. Therefore, there was a relationship for shorter and wide-diameter implants. Reconstruction of the atrophic mandible using short implants without augmentation procedures yielded, after more than 10 years of follow-up, a cumulative implant survival rate of 92.3.A systematic review and metaanalysis on short implants conducted in 2014 provided robust analysis of using short implants (6mm) as a viable treatment option with predictable success rates. The study also pointed out that the failures that were reported were early failures and also had a better survival rates in the mandible compared to the maxilla. Short implants are currently available in a multitude of systems and are backed up by considerable success rates in clinical scenario.

IMPLANT COMPLICATIONS : A REVIEW

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ABSTRACT

To rehabilitate the edentulous arches or partially edentulous arches, various treatment options have been available for the clinicians. Since the last few years, an implant has been the most acceptable treatment with a success rate of 95-99 %.Though the success rate is high but it is inevitable to avoid the complications. Knowledge regarding the types of complications that can occur with dental procedures is an important aspect of treatment planning, dentist patient communication and post treatment care. Various complications may be encountered that includes mechanical, biological, esthetical or prosthetic causes for the failure of an osseo-integrated implants.

INTRODUCTION

Modern dentistry aims to restore the patient to normal function, comfort, aesthetics and health regardless of the atrophy, disease or injury to the stomatognathic system. Continued researches in treatment planning, implant designs, materials and techniques has enabled clinicians to predict a good outcome for treatment[1 2]

Rehabilitating completely edentulous and partially edentulous arches using dental implants have been used as treatment modalitysince long. Though the success rate is 95%, complications are unavoidable[3, 4].

As the time elapsed the implant complications increased. Connection related complications increased from 4.3% to 26.4 % in 10years, loss of retention of restorations have increased to 24.9% from 6.2% in 10 years.[5].

The National Institutes of Health, Consensus Development Conference Statement in 1978 on Dental Implant: Benefits and Risk concluded that, “Thousands of patients have been treated with dental implants for years and there is no question that many received long-term benefits”. However, the report further stated that, “some implants, fail in patients within six months; and some have resulted in extensive bone loss and produced irreversible defects and complications[6].

Lack of primary stability, surgical trauma, and contamination through micro-organisms, occlusal load, improper diagnosis and treatment plan, improperly fabricated prosthesis maycause implant failure[7].

High Success rate has been reported for dental implants that support crown and fixed bridgework[8-13].Complications regarding the implants have also been

reported, if, encountered may lead to the complete failure[14].

IMPLANT PROSTHODONTICS

The selection, planning, development, and placement, replacement of missingteeth and/or associated structures, and maintenance of restoration with dental implants (GPT-9).

AILING AND FAILING IMPLANT

An implant that may demonstrate bone loss with deeper clinical probing depths but appears to be stable when evaluated at 3-4 months interval[15].

Shows radiographic bone loss without clinical signs of mobility and inflammation[16].

An implant is said to be failed when signs of inflammation, bleeding on probing and suppuration is also seen [15, 16, and 17].

FAILED IMPLANT

Failed implants are those which are associated with progressive bone loss, clinical mobility, peri implant radiolucency, dull sound on percussion and are non-functionalas intended[16].

IMPLANT FAILURE

It is defined as the total failure of the implant to fulfil its purpose (functional, aesthetic or phonetic) because of mechanical or biological reasons in the first instance at which the implant performance is measured quantitatively and or inadequacy of the host tissue to establish or maintain osseo-integration[18, 19, and 20].

CLASSIFICATION

1. Rosenberg et al [20 21]	2.Espisito et al [17 18]	3. Truhlar et al[17 21]	4.Cranin [23]
Infectious failure Traumatic failure	Biological Mechanical Iatrogenic Inadequate patient education	Late failures Early failures	Intra-op complications Short term complications (first 6 months post-operatively) Long term complications

5. Heydenrijik et al[24]	6. Adell et al[25]	7. Goodacre et al [27]	8.Balshi [26]
Early failures Late failures Soon late failure Delayed late failures	Loss of Osseo integration Gingival complications Mechanical complications	Esthetic Phonetic Functional Ergonomic	Mechanical Biological Aesthetic

9. Misch etal[28]

TREATENT PLAN RELATED

Wrong angulation
Improper implant location
Too close
Too far apart
Lack of communication

PROCEDURE RELATED

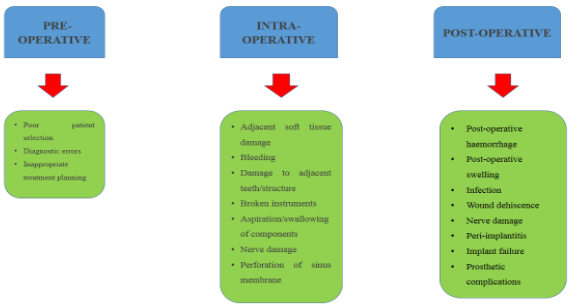
Lack of primary stability
Mechanical complications
Mandibular fracture
Ingestion/aspiration

REVIEW OF LITERATURE

Jemtet al[29] conducted a study on peri-implantitis surgery prevalence and delayed implant failures in a large number of patients. "Early implant failures," was significantly associated with the five factors mainly to the "surgeon" (HR 5.13), followed by "absence of prosthetic treatment" (HR 2.71). The risk for an early failure was found to be 7.0% and 0.1% when all the significant factors were presentand absent respectively. So the role of dentists is strongly associated with the early failure of the implant.

Maria herreroetal[30]studied the success rate of implant retained prosthesis placed by prosthodontics residents. With a mean prosthesis age of 4.5 years, a success rate of 71% in implants and 81% was seen with the implants restored with single crown.Most commonly porcelain fracture in FDP (15%),lack of stability (31%) and retention (29%) in RPD were observed. Thus success rate of implant retained prosthesis was observed to be lower as compared to previous studies.,

Flanagan[31]reported that forces of occlusion may result in implant failure, when acted cyclically and off-axially in range of 50-400N,leading to micro-moment of Osseo-integrated implant.Vasile etal [32]reported that peri-implantitis is the most common complication encountered leading to total bone loss around an Osseo-integrated implant.According to Joan Pi-Anfruns[33], 2014 , implant complications can be divided into :



Bryce etal[34] reported that causes for early failure of implants can be local or general factors which includes various systemic and medical conditions of the patient.Vere j. etal[14], reported the incidence of mechanical complications of implant .

Table 1 Reported incidence of mechanical complications associated with implant retained single crowns and implant retained fixed partial dentures with, or without, cantilever extensions

Complication	Implant single crowns[2]	Implant retained fixed partial dentures[7]	Implant retained fixed partial dentures with cantilevers[6]
Screw loosening	12.7% (5.7%-27%)	5.8% (3.8%-8.7%)	8.2% (3.9%-17%)
Loss of retention	5.5% (2.2%-13.5%)	Not reported	5.7% (1.0%-16.5%)
Veneer fracture	4.5% (2.4%-8.4%)	13.2% (8.3%-20.6%)	10.3% (3.9%-26.6%)
Framework fracture	3% (1.1%-8.3%)	0.8% (0.4%-1.8%)	0
Screw fracture	0.35% (0.09%-1.4%)	1.5% (0.8%-2.8%)	2.1% (0.9%-5.1%)
Implant fracture	0.14% (0%-0.64%)	0.4% (0.1%-1.2%)	1.3% (0.2%-8.3%)

Vere J. etal [14],Pjetursson etal [8] and in Berglundh etal[10] reported thatin period of 5 years and 10 years , the survival

rates for implant supporting crowns and fixed partial dentures exceeds to 95% and 93% respectively. In 55% of implant cases, the loss of implant occurs before functional loading. Pjetursson etal[35] conducted a study on implant supported fixed dental prosthesis. Survival rate increased to 97.2% after 5 years when rough surface implants were used. 95.4% and 80.1% are the rate of implant survival after 5 and 10 years of function. Metal–ceramic implant supported FDPs had survival rate of 96.4% after 5 years and 93.9% after 10 years.Fractures of the veneering material (13.5%), peri-implantitis and soft tissue complications (8.5%), loss of access hole restoration (5.4%), abutment or screw loosening (5.3%), and loss of retention of cemented FDPs (4.7%) were complications observed after 5 years. It was concluded that implant supported FDPs are the good options of treatment though technical and biological complications were frequent (33.6%).

Heasman[36]etal and Heitz[37] etal concluded that peri-implantitis is similar to periodontal disease.Bashutski[38, 39], D'Silva NJ, Wang HL reported that overcompression of the bone during placement leads to unusual failure of the implants. Abt[40] in 2009 reported that dental implant failure after bone augmentation was on higher side in smokers than in non-smokers.Levin L Schwartz-Araz et al[41] in 2008 studied the difference in success rate ofimplant in current smokers, non-past smokers and smokers and compared the long term marginal loss, survival and success of single placed implants using radiographs. Concluding that past smokers had more marginal bone loss than non-smokers. W.Chee et al[42]in 2007 reported proper patient selection and treatment planning can avoid complications. Claudia Cristina Montes[43], in 2007 reported that there is no clinical cause for failure of implant.Men (4.5 %) had more failure rate than women (3.1%). 88.2% of the implants were failed before loading. 58.5 % implants failed in posterior jaw. No reason for the failure of 75% of the implants was reported. Identified causes were 17.5% iatrogenic conditions, poor bone quality and quantity (3%), peri-implantitis (1%), and 3.5% missing data. Results suggested that host factor, notidentified clinically, contribute to an increased riskfor implant loss.In 2007, Streitzeletal[44] compared the effect of smoking on the implant with or without bone augmentation procedures.It concluded that biological complications were commonamongst smokers.In 2006, Shelemay etal[45] reported that cause of peri-implant mucositis is same as that of gingivitis and shift of micro-organisms takes place from gram positive to gram negative anaerobes.In 2006, Ardekian et al[46], reported that sinus membrane perforation is seen where alveolar bone is less than 5mm but overall success remains unaffected.In 2006, Jung etal[47], reported the risk of maxillary sinus penetration in which the implant penetrated the sinus membrane and the bone at 2, 4 and 8 mm. Pathologic and radiographic changes were not seen in the study of 8 dogs. Hence, concluded that sinus lift procedure is not a contraindicationand protrusion of implants into sinus cavity will not lead to sinus complications in canines.Stephelynn DeLuca et al[48] in 2006 reported at the time of implant surgery, non-smoker (13.33%) had a significant lower implant failure rate than smokers (23.8%), concluding that smoking is not an absolute contraindication.

Park etal[49] reported the aesthetic complications of the implants may be

visibility of titanium abutment through gingiva, lack of papillae and malpositionimplant.Kalpidisand Konstantinidis etal[50], reported a case in which lingual cortical plate was perforated during osteotomy preparation in mandibular premolar region. Critical haemorrhage and multiple hematomas were observed and verified by CT scan.Peter K.Moy[51] etal in 2005 reported that the risk of implant failure is significantly aged (60 – 79 years) than in young patients (40 years).Proussaefs etal[52] ,reported that survival and success rate of implants at second stage surgery was 100 % in cases of non-perforated membranes than with the perforated sites 69.6.Tiwani etal[53], found that over a period of 10 years retrospective institutional study, 1 case of aspiration and 36 cases of ingestion were reported.Ercolietal[54] reported that mechanical complications may arise if bone is continuously drilled or if the drill reaches beyond 15 mm in 5 osteotomies.John C.Keller[55] reported that osteoporosis affects Osseointegration of implant, but under the forces of mastication long term biomechanical stability is yet unknown. Leonhardt[56]etal reported that the incidence of peri-implantitis has been increased gradually to 16%. Goodacre[57] etal reported that incidence of bleeding as a complication is about 24 %. Fistulae have been reported in 1% of cases associated with loose abutment screws or ill-fitting frameworks. Soft tissue hyperplasia affects to 20% of fixed prosthesis over an observation period of 9 years.Goodacreetal[33,57]reported the incidence of various prosthetic complications in implant therapy.

Overdenture loss of retention (30%)

Resin veneer fracture (22%)

Overdenture relines (19%)

Overdenture clip/attachment fracture (17%)

Porcelain veneer fracture (14%)

Overdenture fracture (12%)

Opposing prosthesis fracture (12%)

Acrylic resin base fracture (7%)

Prosthesis/abutment screw loosening (7%/6%)

Prosthesis screw fracture (4%)

Metal framework fracture (3%)

Abutment screw fractures (2%)

Implant fractures (1%)

Charles J. Goodacre[57] et al , reported loosening of over denture retentive mechanism, implant loss in irradiated mandible and maxillary overdentures, haemorrhage related complications, resin and veneer fracture , and over denture clip / attachment fracture are the common complication associated with implant supported prosthesis.

Robert L. Simon[58]concluded thatthe implant failure rate was 4.6% with complications of abutments screw loosening (7%) and loss of cement bond(22%). Sharawy[59] etal reported osseous damage may be reduced if implant site is prepared at a speed of 2500 rpm.Niamatu[60] reported a case of airway obstruction after an implant was paced and was secondary to sublingual hematoma and sublingual bleeding.Quirynen[61] etal reported that an active or inactive retrograde peri-implantitis may result in cases with over prepared or overheated osteotomies observed as periapicalradiolucencies radiographically.Bartling[62] etal checked the incidence of the variation in the sensation using the standard neurological tests in 94 patients. At first post-operative

appointment incidence of 8.5% was found. Complete anaesthesia was seen only in one patient for 2 months and resolved later in 4 months. No permanent altered sensation was found over 6 months.

Hofshneider[63] etal and Bavitz[64] etal reported that sublingual and submental arteries course finally to lingual cortical plate from floor of the mouth. It must be taken into consideration that edentulous mandible is shorter and perforations occur deeper in the floor of the mouth and the sublingual haemorrhage has been iatrogenic in nature.

Charles J. Goodacre[65] et al concluded greater implant loss occurred with over dentures. Greater loss was observed in maxilla thanmandible with fixed complete dentures and over dentures. Mechanical complications were screw loosening / fracture, implant fracture; framework, resin base and veneering material fracture, opposing prostheses fractures and over denture mechanical retention problems.

Esposito[66] etal told that anatomic conditions and the surgical trauma are two main aetiologies responsible for early implant failure in branemark implant (3.63 %) due to peri-implantitis.

Ann M. Parein[67] et al evaluated long term outcome, the type and prevalence of prosthetic complications. Significantly fewer complications were found in prostheses supported by one or more implants in premolar than in molar region. Cemented restorations showed fewer complications than screw retained while restoring single tooth.

Robert Hass[68] et al reported that most common complication observed was abutment screw loosening. William Becker[69] et al reported bone quality, quantity, length of implant, and minimized occlusal contacts are the factors contributing for success.

Zarb[70]etal reported that inadequate availability of superior cortical bone, improper drilling and incorrect use of equipment may lead to failure of Osseo-integration in the first stage surgery.Albrektsson[71] reported mucosal perforations and fistulae were the gingival complications. An occurrence of 3 – 5 % was found formechanical complications such as fracture of abutment screw, fixture, or prosthesis.Ericsson and Albrektsson[72] stated, bone resorption was seen when drilling was done at 47°c for 1 minute in rabbits.It concluded that an increase in temperature or duration while drilling may lead to bone necrosis.

CONCLUSION

In the recent times, the dental implant therapy for rehabilitation of the occlusion has been the most accepted and successful treatment if the principles are followed. For the implant treatment to be successful, the stability of the implant should be considered as the main factor. The implant must be stable in the jaw bone after the healing phase is completed.

Awareness and knowledge of various risks involved during the whole procedure, adequate experience of the clinician is needed.

Four essential steps: proper and careful selection of the patient, correct selection of the implant, proper surgical technique and the precise prosthetic replacement have to be considered strictly and followed to prevent or reduce the number of complications.

REFERENCES

1.Misch CE. Contemporary Implant Dentistry – 3rd Edition, Mosby, South Asia edition,2008

2.Babita Yeshwante , SonaliPatil, NazishBaig , SonalGaikwad, Dr.Anand Swami , Dr.MrunalDoiphode , Dental Implants- Classification, Success and Failure –An Overview , (IOSR-JDMS) , May 2015 ; 14 (5) Ver. II : 1-8

3.Jemt T, Lekholm U, Adell R. Osseointegrated implants in the treatment of partially edentulous patients: a preliminary study on 876 consecutively placed fixtures. Int J Oral Maxillofac Implants 1989; 4: 211–217

4.Antolin AB. Infections in implantology: From prophylaxis to treatment. Med Oral Patol Oral Cir Bucal 2007;12:323-330

5.Dental Implant Complications Etiology, Prevention, and Treatment Edited by Stuart J. Froum

6.Dental implants: benefit and risk. NIH Consensus Statement,June 13–14, 1978; 1(3): 13–19.

7.Sakka S, Coulthard P. Implant failure: Etiology and complications. Med Oral Patol Oral Cir Bucal 2011;16(1):e42-44

8.Jung RE, Pjetursson BE, Glauser R, Zembic A, Zwahlen M, Lang NP. A systematic review of the 5- year survival and complication rates of implant- supported single crowns. Clinical oral implants research. 2008 Feb 1;19(2):119-30.

9.Goodacre CJ, Kan JY, Rungcharassaeng K. Clinical complications of osseointegrated implants. The Journal of prosthetic dentistry. 1999 May 31;81(5):537-52.

10.Berglundh T, Persson L, Klinge B. A systematic review of the incidence of biological and technical complications in implant dentistry reported in prospective longitudinal studies of at least 5 years.JClinPeriodontol 2002; 29: 197–212

11.Goodacre C J, Bernal G, Rungcharassaeng K, Kan J Y.Clinical complications with implants and implant prostheses. J Prosthet Dent 2003; 90: 121–132.

12.Aglietta M, Siciliano V I, Zwahlen M et al. A systematic review of the survival and complication ratesof implant supported fixed dental prostheses with cantilever extensions after an observation period of at least 5 years. Clin Oral Implants Res 2009; 20:441–451.

13.Pjetursson B E, Tan K, Lang N P, Brägger U, Egger M,Zwahlen M. A systematic review of the survival and complication rates of fixed partial dentures (FPDs) after an observation period of at least 5 years. Clin Oral Implants Res 2004; 15: 625–642.

14.Vere J, Bhakta S, Patel R. Prosthodontic complications associated with implant retained crowns and bridgework: a review of the literature. British dental journal. 2012 Mar 24;212(6):267-72

15.Truhlar RS. Perimplantitis – Causes and treatment. Oral MaxillofacSurgClin North Am 1998;10:299-308.

16.Askary AS, Meffert RM, Griffin T. Why do dental implants fail? (part II). Implant Dent 1999;8:265-77.

17.Prashanti E, Sajjan S, Reddy JM. Failures in implants. Indian J Dent Res 2011; 2: 446-453

18.Esposito M, Hirsch JM, Lekholm U, Thomsen P. Biological factors contributing

to failures of osseointegrated oral implants (I) success Criteria and Epidemiology. Eur J Oral Sci 1998;106:527-551.

19.ElAskary AS, Meffert RM, Griffin T. Why do dental implants fail? (part I) Implant Dent 1999;8:173-85.

20.Heydenrijk K, Meijer HJ, Reijden Vander WA, Raghoebar GM, Vissink A, Stegenga B. Microbiota around root form endosseous implants. A review of the literature. Int J Oral Maxillofac Implants 2002;17:829-39

21.Truhlar RS. Perimplantitis – Causes and treatment. Oral MaxillofacSurgClin North Am 1998;10:299-308.

22.Hobo S, Ichida E, Garcia LT. Osseointegration and occlusal rehabilitation. London UK: Quintessence Publishing Company; 1996. p. 239-54.

23.Dr.Babita Yeshwante1,Dr.Sonali Patil2,Dr.Nazish Baig3,Dr.Sonali Gaikwad4,Dr.Anand Swami5,Dr.Mrunal Doiphode6 , Dental Implants-Classification, Success and Failure –An Overview , (IOSR-JDMS) , Volume 14, Issue 5 Ver. II (May. 2015)

24.Heydenrijk K, Meijer HJ, Reijden Vander WA, Raghoebar GM, Vissink A, Stegenga B. Microbiota around root form endosseous implants. A review of the literature. Int J Oral Maxillofac Implants 2002;17:829-39.

25.Adell R, Lekholm U, Rockler B, Brånemark PI. A 15-yearstudy of osseointegrated implants in the treatment of theedentulous jaw. Int J Oral Surg 1981; 10:387-416.

26.Balshi TJ. Preventing and resolving complications withosseointegrated implants. Dent Clin North Am 1989;33:821-868

27.Goodacre CJ, Bernal G, Rungcharassaeng K, KanJY. Clinical complications with implants and implantprostheses. J Prosthet Dent. 2003 Aug; 90(2):121-32.

28.Kellymisch , Implant Surgery Complications:Etiology and Treatment , implant dentistry / volume 17, number 2 2008

29.Jemtetal , A retro-prospective effectiveness study on 3448 implant operations at one referral clinic: A multifactorial analysis. Part I: Clinical factors associated to early implant failures , clinical implant dentistry , September 2017; 19(6):980-988

30.Loza-Herrero MA, Rivas-Tumanyan S, Morou-Bermudez E. Success and complications of implant-retained prostheses provided by the Post-Doctoral Prosthodontics Program, University of Puerto Rico: a cross-sectional study. The Journal of prosthetic dentistry. 2015 Nov 30;114(5):637-43.

31.Flanagan D. Diet and implant complications. Journal of Oral Implantology. 2016 Jun;42(3):305-10.

32.Vasile A .clinical study on the incidence and management of biological complications in implant therapy. International Journal of Medical Dentistry. 2015 Jul 1;5(3).

33.Pi-Anfruns J. Complications in implant dentistry. Alpha Omegan. 2014 Mar 1;107(1).

34.G. Bryce, Pre- and post-operative management of dental implant placement. Part 2: management of early-presenting complications , British Dental Journal volume 217 no. 4 aug 22 2014

35.Pjetursson BE, Thoma D, Jung R, Zwahlen M, Zembic A. A systematic

review of the survival and complication rates of implant- supported fixed dental prostheses (FDPs) after a mean observation period of at least 5 years. Clinical oral implants research. 2012 Oct 1;23(s6):22-38.

36.Heasman P, Esmail Z, Barclay C. Peri-implant diseases. Dental Update 2010; 37: 511–512, 514-516

37.Heitz-Mayfield L J. Peri-implant diseases: diagnosis and risk indicators. J ClinPeriodontol 2008; 35:292–304

38.Bashutski JD, D'Silva NJ, Wang HL: Implant compression current understanding and a case report. J Periodontol 2009 Apr; 80(4):700-4

39.Khatri etal review article failures in dental implantology - a literature review , journal of applied dental and medical sciences 2015 apr-jun;1(1):55-62

40.Abt.E. Smoking increases dental implant failures and complications. Evid Based Dent 2009 ; 10(3):79-80.

41.Levin L,Hertzberg R,HarNes S,Schwartz-Arad D. Long-term marginal bone loss around single dental implants affected by current and past smoking habits. Implant Dent 2008 Dec; 17(4): 422-9

42.W. Chee and S. Jivraj Failures in implant denstisty.Br Dent J 2007; 202:123-129.

43.Claudia Cristina Montes, FabianoAlvim Pereira - Failing factors associated with osseo-integrated dental implant loss. Implant dentistry 2007 :16 (4) ; 404-412

44.Strietzel FP, Reichart PA, Kale A, Kulkarni M, Wegner B, Küchler I. Smoking interferes with the prognosis of dental implant treatment: a systematic review and meta- analysis. Journal of clinical periodontology. 2007 Jun 1;34(6):523-44.

45.AviShelemay , Recall, Maintenance and Complications in Implant Patients , June 2006 • Ontario Dentist

46.Ardekian L, Oved-Peleg E, Peled M, et al. The clinical significance of sinus membrane perforation during augmentation of the maxillary sinus. J Oral Maxillofac Surg. 2006;64:277-282

47.Jung JH, Choi BH, Li J, et al. The effects of exposing dental implants to the maxillary sinus cavity on sinus complications. Oral Surg Oral Med Oral Pathol Oral RadiolEndod. 2006;102:602-605

48.Stephelyn DeLuca et al. The Effect of smoking on osseointegration dental implant. Part – 1: Implant survival .Int J Prosthodont 2006; 19:491-498

49.Park S-H, Wang H-L. Implant reversible complications: Classification and treatments. Implant Dent. 2005;14:211-220

50.Kalpidis CD, Konstantinidis AB. Critical hemorrhage in the floor of the mouth during implant placement in the first mandibular premolar position: A case report Implant Dent. 2005;14:117-124.

51. Moy PK, Medina D, Shetty V, Aghaloo TL. Dental implant failure rates and associated risk factors. International Journal of Oral & Maxillofacial Implants. 2005 Jul 1;20(4).

52.Proussaefs P, Lozada J, Kim J, Rohrer MD. Repair of the perforated sinus membrane with a resorbable collagen membrane: a human study. International Journal of Oral & Maxillofacial Implants. 2004 May 1;19(3).

53.TiwanaKK, Morton T, Tiwana PS. Aspiration and ingestion in dental practice:

a 10-year institutional review. The Journal of the American Dental Association. 2004 Sep 30;135(9):1287-91.

54.Ercoli C, Funkenbusch PD, Lee HJ, Moss ME, Graser GN. The influence of drill wear on cutting efficiency and heat production during osteotomy preparation for dental implants: a study of drill durability. International Journal of Oral & Maxillofacial Implants. 2004 May 1;19(3).

55.Keller JC, Stewart M, Roehm M, Schneider GB. Osteoporosis-like bone conditions affect osseointegration of implants. International Journal of Oral & Maxillofacial Implants. 2004 Sep 1;19(5).

56.Leonhardt Å, Dahlén G, Renvert S. Five-year clinical, microbiological, and radiological outcome following treatment of peri-implantitis in man. Journal of periodontology. 2003 Oct 1;74(10):1415-22.

57.Goodacre CJ, Bernal G, Rungcharassaeng K, Kan JY. Clinical complications with implants and implant prostheses. The Journal of prosthetic dentistry. 2003 Aug 31;90(2):121-32.

58.Simon RL. Single implant-supported molar and premolar crowns: a ten-year retrospective clinical report. The Journal of prosthetic dentistry. 2003 Dec 31;90(6):517-21.

59.Sharawy M, Misch CE, Weller N, Tehemar S. Heat generation during implant drilling: the significance of motor speed. Journal of Oral and Maxillofacial Surgery. 2002 Oct 31;60(10):1160-9.

60.Niamtu J. Near-fatal airway obstruction after routine implant placement. Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology. 2001 Dec 31;92(6):597-600.

61.Quirynen M, Gijbels F, Jacobs R. An infected jawbone site compromising successful osseointegration. Periodontology 2000. 2003 Oct 1;33(1):129-44.

62.Ellies LG. The incidence of altered sensation of the mental nerve after mandibular implant placement. Journal of Oral and Maxillofacial Surgery. 1999 Dec 1;57(12):1410-2.

63.Hofschneider U, Tepper G, Gahleitner A, Ulm C. Assessment of the blood supply to the mental region for reduction of bleeding complications during implant surgery in the inter-foraminal region. International Journal of Oral and Maxillofacial Implants. 1999 May 1;14(3):379-83.

64.Bavitz JB, Harn SD, Homze EJ. Arterial supply to the floor of the mouth and lingual gingiva. Oral surgery, oral medicine, oral pathology. 1994 Mar 1;77(3):232-5.

65.Goodacre CJ, Kan JY, Rungcharassaeng K. Clinical complications of osseo-integrated implants. The Journal of prosthetic dentistry. 1999 May 31;81(5):537-52.

66.Esposito M, Hirsch JM, Lekholm U, Thomsen P. Biological factors contributing to failures of osseointegrated oral implants,(II). Etiopathogenesis. European journal of oral sciences. 1998 Jun 1;106(3):721-64.

67.Parein AM, Eckert SE, Wollan PC, Keller EE. Implant reconstruction in the posterior mandible: a long-term retrospective study. The Journal of prosthetic dentistry. 1997 Jul 31;78(1):34-42.

68.Robert Hass. Branemark single tooth implants: A preliminary report of 76 implants. J. Prosthet Dent 1995; 73:274-9

69.Becker W, Becker BE. Replacement of maxillary and mandibular molars with single endosseous implant restorations: a retrospective study. The Journal of prosthetic dentistry. 1995 Jul 31;74(1):51-5.

70. Zarb GA, Schmitt A. The longitudinal clinical effectiveness of osseo-integrated dental implants: The Toronto study. Part I: Surgical results. The Journal of prosthetic dentistry. 1990 Apr 1;63(4):451-7.

71.Albrektsson T. A multi-center report on osseo-integrated oral implants. The Journal of prosthetic dentistry. 1988 Jul 1;60(1):75-84.

72.Eriksson AR, Albrektsson T. Temperature threshold levels for heat-induced bone tissue injury: a vital-microscopic study in the rabbit. The Journal of prosthetic dentistry. 1983 Jul 1;50(1):101-7.

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REHABILITATION OF EDENTULOUS RIDGES WITH LOCATOR OVERDENTURE AND IMPLANT SUPPORTED FIXED DENTAL PROSTHESIS-A CASE REPORT

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Abstract:

Edentulism is poorly received among the young as well as in the old.Various implant supported treatments have not only improves the chewing effeciency but also aids in psycho social well being.Removable implant supported dentures provides good prosthetic outcome with regard to economic and time saving aspects,esthetics and ease of clenasibiltity.Fixed treatment provides high retention and stability with high predictable outcome.The selection of the treatment depends on factors such has bone quality,interacrh distance,patient systemic conditions,cost factor,etc .In this case report we have presented a case with edentulism which was rehabilitated with a locator overdenture and subsequently rehabiltitated with implant supported fixed prosthesis.

Keywords:locator ,Fixed treatment, Ankylos, Full mouth rehabilitation

Key Message: When removable implant supported dentures provides good prosthetic rehabilitation with regard to economic and time saving standards,fixed treatment provides predictable outcome .Removable implant dentures provide cleaning efficiency and esthetics whereas fixed prosthesis provides retention and stability. The choice between the two depends on the patient expectations and the doctor interpretation of the best possible treatment.

Introduction:

This is the era where people seek a full functional limitless life. Their biological age no longer follows their mental age. People want a well-rounded life may it be at their 20s ,30s or their late 80s and now tooth loss is no longer a barrier .Dental implants have fulfilled this purpose for a few decades now. Various treatments that include removable and fixed options are evolving to benefit various clinical situations.

Implant supported prosthesis has improved patients` ability to look better, eat better and thus live better. Clinical studies have shown better improved life conditions in fixed option than removable treatment options. Although fixed prosthesis shows higher rate of patient acceptance, all clinical scenarios don't allow a fixed option. The patient must be rehabilitated with atleast 4-6 implants for fixed prosthesis [1] so patients with insufficient bone height or poor quality of bone will have to proceed with removable options such as ball, bar or locator attachments.

Simrahan et al concluded that Locator attachment to be more advantageous to ball and bar sytems, regarding the rate of complications in clinical practice.[2]

In this case report we have presented a treatment of an 82 year old patient with edentulism who had expressed his strong desire for a fixed treatment.

Case History:

An 82 year old male patient reported to the Department of Oral Implantology with a chief complaint of missing upper teeth and lower teeth. On dental examination it was found he was a partially dentate patient with failing existing dentition with a grade III mobility .

On clinical examination it was found that he was in prime of health with no debilitating disorders . Medical investigations such as routine blood checkups ,vital signs were carried out. No medical history was reported that contradicted the implant treatment .

Psychosocial status:the patient was philosophical and expressed a strong desire for a fixed prosthesis.

Diagnosis :

Clinical study models were fabricated and surgical measurements and radiographic examination (panoramic Rx) of maxillary and Mandibular area was done .

Radiological assessment: Pre operative OPG:(**Figure 1**)On radiographic analysis we found sinus pneumatisation in the maxilla with reduced bone height in the posterior region. The mandible had adequate bone height of 10-11mm anteriorly.

Since we had enough data with the existing study models and xrays a CBCT was avoided.

Figure 1 :Preoperative OPG

Treatment planning:

- Extraction of the remaining teeth and immediate implant placement.
- Placement of Ankylos C/X implant (B-8mm) in 35 and 45 region.

  (A-9.5mm) in 33 and 43 region,(B-11mm) in 15 region, (B-9.5mm) in 23 region,(A-11mm) in 13 region,(B-11mm) in 25 region.
- Maxillary and Mandibular ridges with metal ceramic prosthesis.
- Patient recall and check up every 6 months

The treatment plan was explained to the patient, and informed consent was obtained thereof as he agreed with the proposed prosthetic solution.

Pharmacological management:

Patient was prescribed antibiotics (Amoxicillin 500 mg) one day before surgery and one hour before sugery as prophylaxis.

Patient would be later adviced to continue the antibiotics thrice daily for a week post surgery.

Analgesics(Diclofenac Sodium 50 mg) were also prescribed post treatment. Antibacterial mouth rinse (Chlorhexidinegluconate) was also prescribed.

Case report:

Surgical phase:

The patient was prepared and sterilized surgical instruments were arranged for the surgery.Extractions were carried out with respect to maxillary and mandibular anterior teeth under local anaesthesia.(figure 2),(figure 3)The sockets were curetted and irrigated with antibacterial solution(chlorhexidine).

Fig.2 Extraction of mandibular teeth

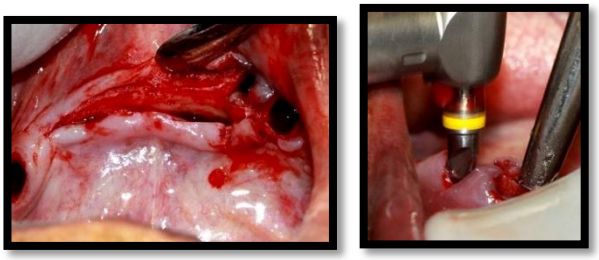
Fig.3.Extraction of maxillary teeth

Fig.4. Flap elevation

Midcrestal incisions were carried out and full thickness flap was elevated(figure 4).Septal bone was removed to ensure flap repositioning and tissue closure in the maxillary region.

Implant osteotomies were carried out with recommended sequence of drills (Ankylos c/x) with copious irrigation. Linderman drill was

used initate the sequential osteotomy. Trispade drill A &B were used to extend the osteotomy site according to the selection of the implants .(figure 5a &5b) .

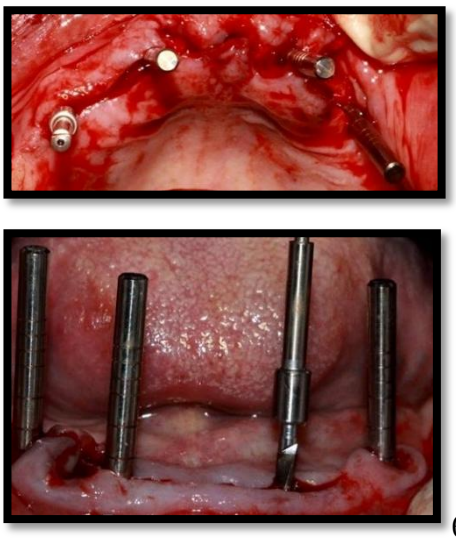


5a 5b

Fig.5a: Trispade drill A forAnkylos c/x A implants.

Fig 5b: Trispade drill B for Ankylos c/x B implants

Guide pins were placed in each osteotomy to indicate the direction and ensure parallelism between implant osteotomy sites.(figure 6a &6b).



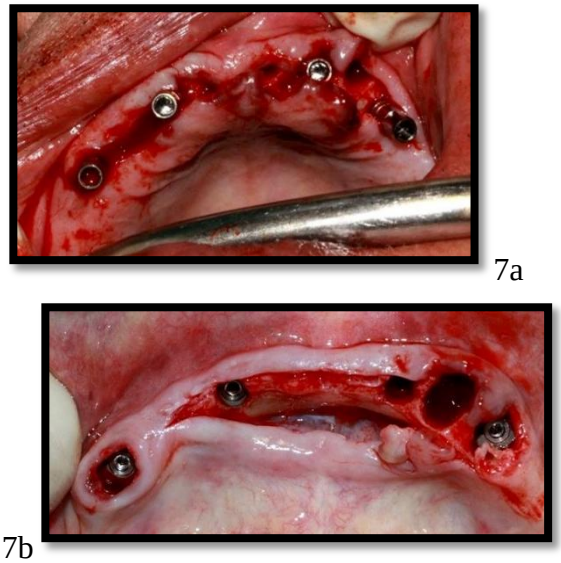
6a

6b

Fig 6a: Paralleling pins placed in the maxillary ostetomies

Fig 6b: Paralleling pins placed in the mandibular ostetomies

In the mandibular region,Implants (Ankylos c/x wrt 35,33,43,45) (figure 7a) were placed carefully ,keeping a safe distance from the mental foramen. In the maxilla Implants (Ankylos c/x wrt 15,13,23,25) were placed at a maximum angulation of 20 degree, avoiding the sinus floor.(figure 7b).



7a

7b

Fig 7a: completion of implant placement in maxilla

Fid 7b: completion of implant placement in mandible

Primary stability of 35 Ncm was achieved. Cover screws were then placed in. Interrupted sutures were placed for primary closure.Immmediatepost operative OPG was then ordered(Figure 8)

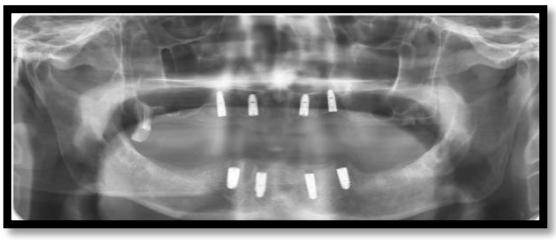


Fig.8 Post operative OPG

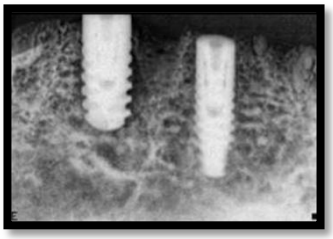
Patient was placed on post operative antibiotic regimen and on analgesics along with instructions on maintenance of oral hygiene and was recalled after one week, one month

and three months,six months and 1 year for follow up.

Prosthetic phase (three months post implant placement):

Patient wasrecalled for second stage surgery after three months of implant placement. On radiographic analysis significant crestal bone loss was seen with respect to 45 .(fig 9a)

Cover screws were retrieved non invasively under local anaesthesia.



9a

9b

Fig 9a: implant failure wrt 45 –IOPA

Fig 9b: implant failure wrt 45 –Clinical view

There was failure of the implant placed in the 45 region as suspected(figure 9b). This may be attributed to residual infection in the extraction socket.Implant level impressions were made and casts were poured.(figure 10a & 10 b) .

Fig 10a: final casts showing impression post- maxilla

Fig 10b: final casts showing impression post- mandible

Abutments were selected .(regular abutments for the maxillary arch and LOCATOR abutments for the mandibular arch). Maxillomandibular relations were recorded and transferred to a semi adjustable articulator. Trial of the metal framework and the denture was carried out. The maxillary arch was then rehabilitated with implant supported fixed dental prosthesis. A LOCATOR attachment denture was planned for the Mandibular ridge due to the loss of an abutment for the fixed prosthesis.For the delivery of the prosthesis following steps were done . The LOCATOR abutments were screwed in with the driver and block out spacers were placed on the heads of the abutments. Female attachments were positioned with the processing inserts (which will later be replaced with the retentive inserts). The Mandibular denture was ground in the region of the subsequent females so that it could be cemented with cold cure acrylic resin. The denture was then finished and polished.An OPG was then ordered for ensuring proper fit(figure 11)

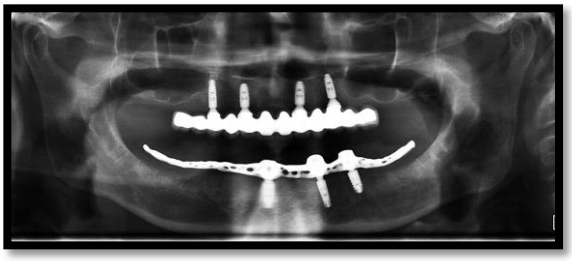


Fig 11: OPG showing locator attachments

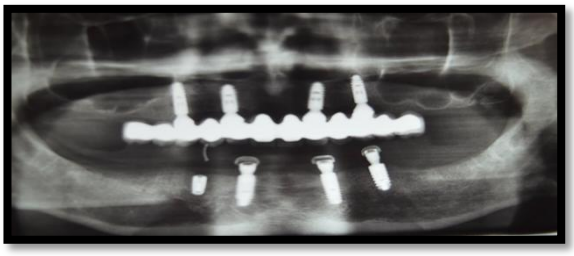


Fig 12:Implant placement in the 45 region-OPG

After three months of wearing removable prosthesis with locator attachment, patient expressed the need for a fixed prosthesis. Ankylos c/x implant was placed in the healed site (45) (figure 12) The patient was then recalled after three months for rehabilitation of the Mandibular ridge with fixed prosthesis. The locator abutments were replaced with regular abutments and implant supported fixed dental prosthesis was cemented in the Mandibular arch.(fig 13 a,13b,13c),

Fig 13 a: left lateral view of the patient (post cementation)

Fig 13 b: right lateral view of the patient (post cementation)

Fig 13 c: facial view of the patient (post cementation)

The 18 month follow up OPG was then taken and sustained level of crestal bone was seen.(figure 14)

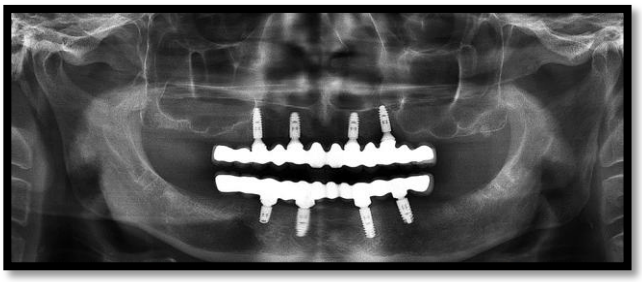


Fig 14: Post cementation of the FDP –OPG

Discussion:

Implant supported overdentures provides retention and good support with the help of the mucosa as well as the implant. Although overdentures have proven to be a successful treatment option which is economic and time saving, multiple pulls of the removable prosthesis can hinder the retentive values of the attachments which would require replacements and multiple visits[3,4,5]. Fixed prosthesis has shown higher stability , the fixed treatment received a higher rating on the ability to chew.[6]

The most common reason for choosing a dental implant prosthesis was to improve eating ability. Most studies reported improved eating ability after a fixed treatment. Patient tend to report function and chewing ability to be more important than esthetics

In this case, a fixed full mouth rehabilitation was planned so four implants were placed in each arch. Unfortunately the implant in the 45 region failed(extraction placement) . This may be due to the fact that there was remnants of

infective tissue remaining in the extraction socket.[7,8] Thus a thorough curettage with local antibiotic treatment or planning a different site of implant placement would have been another option .Since we deprived final fixed prosthesis of one abutment support ,the patient was treated with locator overdenture. Locators have shown excellent patient compliance with good retentive and resilient properties .Locator attachments are in different colors (clear, pink, blue, green, orange, red) and each has a different retention value.[9] Since the patient was insistent on fixed treatment we placed a new implant in the region 45(after 4 months of healing)[10,11]

Patient was thenrehabilitated with fixed shortened dental arch implant supported prosthesis.

While some patients are comfortable with overdentures ,some patient expects a more stable retentive option such as a fixed dental prosthesis. Treatment options can vary from person to person, a thorough knowledge of the patient history and also,in this case, the patients expectations will help a practitioner to provide the best possible result.

Further studies have to be conducted so as to provide a reduced time span to rehabilitate the edentulous areas.

REFERENCES:

1) Brånemark P.I., Svensson B, Steenberghe D.V. Ten-year survival rates of fixed prostheses on four or six implants ad modumBrânemark in full edentulism.Clin Oral Implants Res,1995;6:227-31

2) Sirmahan C, Taylan C, Mehmet Y. Complications associated with the ball, bar and Locator attachments for implant-supported overdentures. Med Oral Patol Oral Cir Bucal. 2011 Nov 1;16 (7):e953-9.

3) Van Kampen F, Cune M, van der Bilt A, Bosman F. Retention and post insertion maintenance of bar-clip, ball and magnet attachments in mandibular implant overdenture treatment: an in vivo comparison after 3 months of function. Clin Oral Implants Res. 2003; 14:720-6.

4) Trakas T, Michalakis K, Kang K, Hirayama H. Attachment systems for implant retained overdentures: a literature review. Implant Dent. 2006;15:24-34.

5) Chung KH, Chung CY, Cagna DR, Cronin RJ, Jr. Retention characteristics of attachment systems for implant overdentures. J Prosthodont. 2004;13:221-226.

6) Grogono AL, Lancaster DM, Finger IM: Dental implants: A survey of patient's attitudes.JProsthet Dent .1989;62:573-576

7) Kohru,rudek I, wanghl.Immediate Implant placement :positives and negatives: implant dent .19(2):98-108

8) Tara
L. Aghaloo, Martin Mardirosian and Bran do Delgado. Controversies in Implant Surgery. Oral and Maxillofacial Surgery Clinics of North America 29:4, 525-535.

9) Evtimovska E, Masri R, Driscoll CF, Romberg E. The change in retentive values of locator attachments and hader clips over time. J Prosthodont. 2009;18:479-83.

10) Grossmann Y, Levin L. Success and survival of single dental implants placed in sites of previously failed implants. J Periodontol. 2007;78(9):1670-4

11) Alghamdi, A. (2012). Successful treamtent of early implant failure: A case

series. Clin Implant Dent Relat Res, 380-7.

12) Attachment systems for implant overdenture: influence of implant inclination on retentive and lateral forces Tsung-Chieh Yang Yoshinobu Maeda TomoyaGondaSunnyKotecha,clinicaloral implant research, Clin. Oral Impl. Res. 22, 2011 / 1315–1319

13) LocatorManual:https://www.zestanchors.com/media/wysiwyg/pdf/locator/L8012-TM_REV_D_03-14_tech_manual_only.pdf

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THE NEUTRAL ZONE TECHNIQUE REVISITED

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ABSTRACT: The major aim of treating a completely edentulous patient is restoring the aesthetic, form and functionby replacement of the lost structures within the oral cavity. One of the most commonly faced problems among long term denture wearers is the reduction in the denture bearing area due to resorption. Prosthetic Rehabilitation patient with severely resorbed ridge is one of the most challenging task a prosthodontist can undertake. This article describes the use of neutral zone (NZ) technique in an effort to achieve successful complete denture therapy with enhanced stability.

KEYWORDS: Neutral zone, Atrophic mandible, Impression technique, Stability.

INTRODUCTION

Complete dentures are primarily mechanical devices,but since they function in the oral cavity, they must be fashioned so that they are in harmony with normal neuromuscular function. All oral functions, such as speech,mastication, swallowing, smiling, and laughing, involve the synergistic actions of the tongue, lips, cheeks, and floor of the mouth which are very complex and highly individual. Failure to recognize the cardinal importance of tooth position and flange form and contour often results in dentures which are unstable and unsatisfactory, even though they were skilfully designed and expertly constructed. The coordination of complete dentures with neuromuscular function is the foundation of successful, stable dentures.[1]

Loss of teeth leaves us with multifactorial changes occurring in the mouth in the form of resorption of alveolar ridge, tongue expansion, laxity of muscles of cheek and face which are unable to counteract tongue forces towards buccal aspect. Hence, leaving crest of residual alveolar ridge, is not an ideal foundation for placement of artificial teeth.[2]

Many edentulous people can experiencedifficulty in carrying out functional activities when wearing complete dentures. This may be due to a number of factors, one of which is the ability to control the dentures effectively during mastication and speech. For this reason, it is critical whenconstructing complete dentures toincorporate features in their design whichwill aid stability in function. Successful treatment of patients withcomplete dentures depends mainly uponthe proper positioning of the teeth on thedenture foundation. Neutral zonewas defined as "that area in the mouth where the forces of tongue pressing outward are neutralized by forces of cheeks and lips pressing inward". This concept was followed andprescribed by many since then for e.g.: Russel (1959) who termed it as "Reciprocal space", Robert (1960) called it the "Potential space", Heath (1970)as "Denture space" Bates (1984) as "Reciprocal zone", Mathew (1961) as "Zone of minimum conflict" and Fenn(1986) termed it "Zone of neutral muscular forces".

Instability in mandibular completedentures may be present due to a number of reasons. The common ones, as described by Jagger & Harrison[3] are:

a) Inappropriate extensions of buccal and lingual flanges of a denture;

b) Poorly adapting denture fitting surface;

c) Severely atropic mandibular alveolar ridge;

d) Poorly contoured polished surfaces of a denture;

e) Abnormal denture teeth positions, inappropriate orientation and high level of the occlusal plane and presence of occlusal errors.

The neutral zone is the potential space between the lips and cheeks on one side and the tongue on the other, that area or position where the forces between the tongue and cheeks or lips are equal.[4]

Many materials have been suggested for shaping the neutral zone: modeling plastic impression compound, soft wax, a polymer of dimethyl siloxane filled with calcium silicate, silicone, and tissue conditioners and resilient lining materials. Many techniques have also been suggested using the materials in conjunction with movements including sucking, grinning

and whistling, and pursing the lips. The swallowing/ modeling plastic impression compound technique located the neutral zone, using swallowing as the principle modeling function.[5]

INDICATIONS OF NEUTRAL ZONE:

It is basically advocated in the following conditions:

- Severly atrophic mandibular ridge
- Patient with high mentalisattachment
- Patient with partial glossectomy
- To facilitate in locating optimal position for implant
- Patient with partial mandibular resection

ADVANTAGES OF NEUTRAL ZONE:

- Improved stability
- Better retention
- Posterior teeth will be correctly positioned allowing sufficient tongue space
- Enhanced aesthetics due to facial support
- Improved masticatory function
- Better comfort
- Improved speech

CASE REPORT:

A 52 year old female patient reported with the chief complaint of ill-fitting denture associated with discomfort on wearing the dentures. On examination, it was found that both the upper and the lower arches were edentulous and severely resorbed. (Figure 1) The patient gave a history of wearing dentures since past 10 years. On examination of the existing dentures, attrition of the denture teeth was found as well as a reduced vertical dimension was observed. Hence, fabrication of complete dentures with the help of neutral zone technique was planned and the patient was explained about the same.

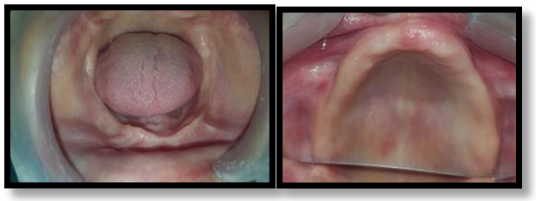

Fig 1: Resorbed maxillary and mandibular arches

Primary impressions of the upper and lower jaw were made with impression compound using metal stock trays and the model was poured in dental plaster. Following which closed fitting upper and lower custom trays were fabricated using self-cure acrylic resin. The extensions of the custom trays were evaluated intra-orally border moulding was done with the help of green stick compound and secondary impressions were recorded using zinc-oxide eugenol impression paste .The master casts were poured in dental stone. After obtaining the master cast,

upper and lower base plates were fabricated using acrylic resin. The base plates were trimmed and checked for extensions, retention and stability in the patient's mouth. For the mandibular cast another base plate was fabricated on which orthodontic wire bent in the form of loops was attached, these spurs were made in order to aid in retention of the admix material while recording the neutral zone(Figure 2).Wax occlusal rims were made over upper and lower base plates and occlusal registration was recorded in a conventional manner. The height of the wax rims were adjusted intraorally to permit an acceptable occlusal vertical dimension (OVD) and a freeway space of 2mm.Centric relation was recorded and articulation was done. (figure.3)

Fig 2: Crib placed on denture base

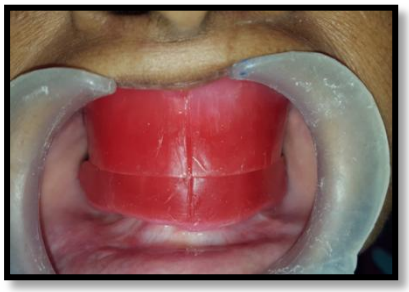

Fig 3: Jaw Relation recorded

An admix ratio of impression compound and green stick compound(7 parts impression compound and 3 parts green stick compound) was softened in water bath at 65 ^{0} c and moulded into the shape of a rim and adapted on the wire loop, following which it was placed in the patient's mouth. The patient was then asked to perform various repeated actions likesucking, swallowing and taking frequent sips of water, pursing lips, pronouncing E and O sounds and protruding the tongue to simulate physiological movements. Performing these various oral movements helps in shaping / moulding of the material thereby facilitating the recording of the neutral zone. After 5–10 min, the set impression was removed from the mouth and examined(Figure 4).

Fig 4: neutral zone recorded

The neutral zone impression so obtained was placed on master cast and location grooves were made on the master cast. A silicone putty material was mixed and adapted on both labial and lingual sides around the neutral zone impression to

obtain an index (Figure 5)The compound material along with the wire-loops were removed and were replaced with modelling wax using the putty indices (Figure 6) and the height of the mandibular occlusal rims were adjusted according to the articulated maxillary occlusal rims.

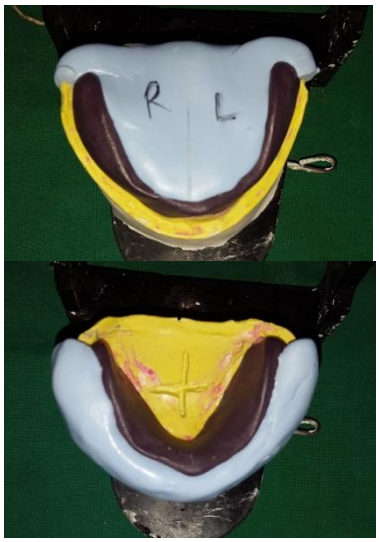

Fig 5: Putty index made of the neutral zone record

Fig 6: Wax placed in the area of neutral zone

Maxillary teeth arrangement was done in a conventional manner and the mandibular teeth were placed exactly following the index. The position of the teeth was verified by placing the index together around the wax try-in(Figure 7).The waxed up dentures were checked in the patient's mouth for esthetics, phonetics and occlusion. Once the try in was found satisfactory, the dentures were processed, finished and inserted.

Fig 7: Teeth arrangement

Fig 8: Try -in done

Fig 9:Prosthesis Insertion

Fig 10: Pre-operative and post-operative view

CONCLUSION: Neutral zone technique is one of the best alternative techniques for fabricating acomplete denture for patient with highly resorbed ridge, but it is generally not practiced because of the extra clinical step involved. The neutral-zone philosophy is based upon the concept that within the mouth there exists a specific area where forces generated by the tongue and those generated by the lips and cheeks are neutralized by each other, where the function of the musculature will not unseat the denture. The neutral zone technique is considered to be an alternative approach for patients complaining of unstable dentures, especially when it is not feasible to do implant therapy.

REFERENCES:

1.Beresin VE, Schiesser FJ. The neutral zone in complete dentures. The Journal of prosthetic dentistry. 1976 Oct 1;36(4):356-67

2.Fahmi FM. The position of the neutralzone in relation to the alveolar ridge. JProsthet Dent 1992;**67**:805-09.

3.Jagger D, Harrison A. Complete Dentures-problem solving. London; BDJ Books. 1999.

4.The glossary of prosthodontic terms. J Prosthet Dent 2005;94:10-92.

5.Makzoumé JE. Morphologic comparison of two neutral zone impression techniques: A pilot study. J Prosthet Dent 2004;92(6):563-8.

6. Porwal A, Jain P, Biradar SP, Nelogi S, Naveen HC. Neutral zone approach for rehabilitation of severely atrophic ridge. International journal of dental clinics. 2010 Sep 30;2(3).

7. Arora V, Nagpal V, Setia P, Mittal N. Complete Denture in Neutral Zone: Case Report.International Journal of Enhanced Research in Medicines & Dental Care ISSN: 2349-1590, Vol. 2 Issue 7, July-2015.

8.Pawah S, Gupta A, Madan B. The relation of the Neutral zone to the crest of the residual alveolar ridge in completely edentulous subjects-A clinico-Radiological study. Journal of Oral Health and Community. 2011;5:90-3..

9.Cagna DR, Massad JJ, Schiesser FJ. The neutral zone revisited: from historical concepts to modern application. The Journal of prosthetic dentistry. 2009 Jun 30;101(6):405-12.

10.Lynch CD, Allen PF. Overcoming the unstable mandibular complete denture: the neutral zone impression technique. Dental update. 2006 Jan 2;33(1):21-6.

11.Fahmy FM, Kharat DU. A study of the importance of the neutral zone in complete dentures. The Journal of prosthetic dentistry. 1990 Oct 1;64(4):459-62.

12.Alfano SG, Leupold RJ. Using the neutral zone to obtain maxillomandibular

13.Relationship records for complete denture patients. The Journal of prosthetic dentistry. 2001 Jun 30;85(6):621-3.

14.Ohkubo C, Hanatani S, Hosoi T, Mizuno Y. Neutral zone approach for denture fabrication for a partial glossectomy patient: a clinical report. The Journal of prosthetic dentistry. 2000 Oct 31;84(4):390-3.

15.Lee JY, Choi SY, Lee JH. Neutral zone approach for rehabilitation of severely atrophic maxillary and mandibular ridges: A case report. The Journal of Korean Academy of Prosthodontics. 2016 Oct 1;54(4):407-12.

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MANAGEMENT OF LAX TISSUES TO IMPROVE POSSESSION BY WINDOW TECHNIQUE.

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Abstract:

The treatment procedure for compromised edentulous ridges in a conventional manner is a very difficult task. To fulfil patient desire such as function and aesthetics the procedure need to be modified. This case report describes one of the impression techniques for completely edentulous patient with localized hyperplastic ridges.

Key words: flabby ridge, window impression technique, floppy tissue.

Introduction:

The compromised ridges can be atrophic ridge, flabby ridge, and knife edge ridge and abused ridges[1]. Residual ridge resorption is a complex biophysical process, it is a common occurrence following extraction of teeth and the rate of ridge resorption is faster during the first year and at a slower rate as year passes. The impression techniques play a key role for the compromised ridges and a master impression should record the entire functional denture bearing area to ensure maximum support, retention and stability for the denture during use[2]. For flabby ridges the alveolar mucosa over the ridges is with unusual thickness and mobility. It is thick in some area from 2-4mm .The mucosa has no bone support when the mucosa is more than 4mm in some area if the atrophy of alveolar mucosa is rapid. It can be associated with either of the arches but commonly seen in anterior part and tubers of maxilla. If flabby ridges are present may give rise to complaints of pain or looseness when the denture rests on them. The superficial area of mobile soft tissue replaces the alveolar bone due to its resorption and the mobile soft tissue gets displaced due to masticatory force leading to loss of peripheral seal[3]. This type of ridges must be properly managed with impression techniques otherwise it adversely affects retention, stability and support of complete denture.

The conventional impression techniques compress the flabby ridge and later tend to recoil and dislodge the overlying denture. There are impression principles such as mucostatic impression technique which achieves support from the other firm areas of denture bearing area for maximum retention[4]. Muco-compressive technique which compress the loose floppy tissue to obtain functional support from it and to replicate the contour of the ridges during

compression of occlusal forces. The prevalence is about 24% of edentulous maxilla and 5% of edentulous mandible in both jaws most frequently in anterior region[5].

Case report:

An 82 year old patient reported requesting for the new set of dentures (Figure-1). The patient had been completely edentulous for 20 years and had two sets of denture previously. The patient complained that the present denture were ill-fitting and had difficulty in eating and also complains of discomfort for which he wishes to have a new set of denture. Patient does not give any relevant medical history. On examination it was noticed there was a bony protuberance and flabby tissue in the anterior part of maxilla(Figure-2). Treatment modalities like surgical procedures followed by fixed orremovable prosthesis, conventional procedure without surgical excision were the options explained to the patient. Patient however was not interested in surgical procedures so; window impression technique was planned for the patient.

Pre-treatment (Figure-1)

Maxillary arch(Figure-2)

A preliminary impression was made using irreversible hydrocolloid and cast was poured. A spacer was placed, special tray was constructed using auto -polymerizing resin and the area where flabby tissue is present was left uncovered (Figure-3 & 4). Border moulding was carried on the maxillary arch using low fusing compound and the impression was made using ZOE, then the exposed window area is covered using light body polyvinyl siloxane material(Figure-5). The material is placed in a passive manner to prevent distortion of the soft tissues. The impression was removed in a single jerk and the master cast was poured with dental stone once the impression is carefully evaluated. The record base was fabricated and occlusal rims were made (Figure-6). Jaw relation was recorded(figure-7) followed by Try-in (figure-8) and processing of denture was carried.

Primary cast with Spacer (figure 3)

Custom tray(Figure-4)

Secondary impression(Figure-5)

Jaw Relation(Figure-6)

Try -In (Figure-7)

Post-operative view (Figure-8)

Discussion:

The objective of complete denture therapy is restoration of function; enhance aesthetics and maintenance of patient health. If the tissue presents unstable and undesirable denture base foundation it is a challenging task to the clinician to manage this flabby tissue. The treatment regime begins with the elimination of the cause and start the recovery progress. The treatment approach can be surgical excision of flabby tissue followed by conventional dentures or implant retained prosthesis; removable or fixed conventional prosthodontics without surgical intervention.

Alveoloplasty, Surgical excision of flabby tissue followed by denture fabrication on the firm immobile tissue enhances stability and can be one of the treatment options and the patient was not willing for this type of approach. The use of dental implants is also not without difficulty. Therefore the patients for a various reasons such as clinical and financial are unsuited for dental implant treatment.

A treatment was completed for this flabby tissue ridge following window technique.Theimpression technique which will compress the non-flabby tissue to obtain support and at the same time will not displace flabby tissue providing a good peripheral seal. If the flabby tissue is compressed during conventional procedure it will tend to recoil and dislodge the resulting denture. Other techniques: 1)one part impression technique (Selective perforated tray): used when degree of mucosal displacement is minimal. Primary impression made with alginate and final impression is made using impression plaster or low viscosity silicone.2)Palatal splitting using a two tray system: 1964Osborne, palatal tray impression was made with ZOE and for 2nd tray material used was silicone.3)Selective pressure flame: it is a muco-compressive technique without displacement. The primary impression is made with alginate or impression plaster. The special tray is constructed and the material overlying firm denture bearing area is softened with a flame before tray is seated under heavy force attempts to replicate functional force and functional impression made with ZOE.4)Two part impression technique: Mucostatic and muco-compressive combined described by Osborne. Primary impression was made and special tray was constructed with flabby tissue uncovered. Border moulding done and impression of firm supported mucosa is recorded with ZOE paste or medium bodied silicone. Impression of displaced area recorded by impression plaster or light bodied silicone. Rim handle design also plays a role[6].

Few authors states that the Excision of flabby tissue is contraindicated where little or no alveolar bone remains. The prognosis is questionable if bone augmentation is done. There is also other school of thoughts that retaining this

fibrous tissue provides a cushioning effect and reduces trauma to the underlying bone but after removal the retention is adversely affected because of decrease in sulcus depth and also increase the bulk of the denture base which increases the weight of the prosthesis. It is argued that for conventional prosthodontics retaining a tissue and providing a substantial retention for denture base is more desirable than no ridge at all[7].

For theelderly patient who are not interested in surgical proceduressuch as excision of flabby tissue and implants the other alternative such as modification in impression technique can be carried out. For the elderly 82 years patient as he was unable to sit on the dental chair for longer time and the dentures was fabricated within short time using window techniques solved his problems and made patient happy. Hence, management of flabby tissue with modification in impression technique can be one of the best treatment approaches. The advantage of this technique is to check for sequester of peripheral seal and its extension into sulcus before recording the displaceable tissue in static condition.

Conclusion:

A sound knowledge and operator skill is mandatory for choosing an impression technique for successful restoration. The selection of technique should be based on location and extent of unsupported tissues.

Reference:

1)Prasad K, Mehra D, Prasad A. Prosthodontics management of compromised ridges and situations.Nitte university journal of health sciences march2014; 4(1):141-47.

2) Kumar S, Mishra P, Dutt P and G.C Shiva Kumar.An unusable approach for making impression in the flabby ridge using mesh. International Journal of Recent Scientific Research 2015; 6(9):6628-31.

3) Porwal A, Jain P, Biradar SP, Nelogi S. Neutral zone approach for rehabilitation of severely atrophic ridge. International Journal of Dental Clinics; 2010; 2(3).

4) Ali Mariyam, Chaturvedi Saurabh, Shah M.Innovative Tunnel Technique For Mandibular Flabby Ridge.International Journal Of Dental Clinics 2012;4(1):74-76.

5) Saluja BS, Ghai KS,Mahajan A, Bajaj H.Management Of Flabby Ridge:A Case SeriesAdv. Med Dent Science Res 2015; 3(2):109-115.

6) Naik Ravi,Madhukiran,Ittaghi Jayaprakash.Impression techniques for flabby ridge.Journal of Dental Sciences and Research;5(1):7-9.

7) R W I Crawford and A D Walmsley. A review of Prosthodontics management of flabby ridges. British Dental Journal December 2006;199:715-19.

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A SIMPLE TECHNIQUE TO LOCATE ABUTMENT ACCESS HOLE IN CEMENT RETAINED IMPLANT CROWNS: A CLINICAL TIP

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ABSTRACT:

This article highlights a simple technique to gain access to abutment screw through the cement retained crown with a high degree of predictability.

Keywords: Access hole, cement retained implant crown, Putty index

INTRODUCTION:

The prosthetic phase of implant therapy involves fabrication of either cement retained or a screw retained prosthesis. Abutment screw loosening is one of the most common technical complications encountered[1], which necessitates the operator to access the abutment screw through the prosthesis for either removal or replacement. Several authors have mentioned different methods of gaining access to the abutment screw hole.**Doerr**[2] and **Tarlow**[3]described a method to gain access by using a vacuum formed matrix with access holes corresponding to abutment positions. **Hill**[4]described the fabrication of a putty index for the same purpose. **Schwedhelm and Raigrodski**[5]described a procedure which involves staining of the occlusal surface of the ceramic crown at the area corresponding to access hole location. **Lautensack J et al**[6]described a method of using a vacuform template that provides information regarding the screw location and angulation of the screw channel and enables guided drilling through the template.**Figueras-Alvarez et al**[7]and **Daher et al**[8]advocated the use of photograph as a record to ensure correct position of access hole location.**Wadhwani et al** [9] described a procedure for fabricating a custom-made and precision implant-locating device to record the access position of the abutment screw. **Patil and Patil**[10]suggests preservation of the occlusal photograph of the restorations (indicating the access-points) placed on a definitive cast in the form of a computer file and transferring this to the patient's e-mail or social networking account. Most of the above mentioned methods are either cumbersome to fabricate, technique sensitive or require additional armamentarium and instrumentation.

The current technique involves the use of an orthodontic wire along with a PVSputty matrix which enables the operator to easily and accurately locate the screw access hole intraorally.

Procedure:

Record the impression using a suitable technique (open tray or closed tray) and material and attach the laboratory analogue to the impression coping .Pour the impression after application of gingival mask.

Retreive the cast, attach the abutment to the analogue and perform the necessary

modifications, following which a crown is fabricated on the abutment.Once the crown is ready, unseatthe crown from the abutment on cast and a 21 gauge wire is used to create a small loop of 2 mm diameter with wires extending about 10mm from both arms of the loop.

The loop is then adjusted such that it corresponds with the occlusal aspect of abutment screw access hole with the wire positioned above the level of the prosthetic crown.(figure 1)

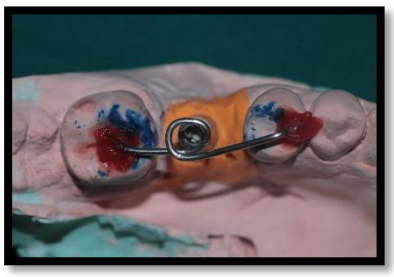

Fig.1 A loop of orthodontic wire corresponding to the access hole on abutment.

Once this position is fixed and stabilized using pattern resin on the arms of the loop extending on adjacent teeth, the crown is replaced back on the abutment and the putty index is fabricated on the crown and the adjacent teeth covering both buccal and lingual sides.

Fig.2 silicone putty embedding the orthodontic wire with the final crown seated in position.

Any excess putty covering the wire and the occlusal surface is cleared over the loop. This putty index is then preserved for future reference.

The technique presents advantages in terms of ease of fabrication, use of materials and accuracy of location of the access hole. Poor relocation of the access hole may lead to non-usage of the crown or rather damage to the underlying abutment itself which may necessitate usage of a new abutment and crown. This is especially true with regard to abutment screw retightening or replacement which does not involve any physical damage to the crown or abutment thereby not warranting their replacement. Operator does need to preserve the index which necessitates a certain amount of care in terms of record maintenance.

References:

1) Nissan J, Narobai D, Gross O, Ghelfan O, Chaushu G. Long-term outcome of cemented versus screw-retained implant-supported partial restorations. *Int J Oral Maxillofac Implants.* 2011;26(5):1102-07.

2)Doerr J. Simplified technique for retrieving cemented implant restorations. J Prosthet
Dent 2002; 88:352-3.

3)Tarlow JL. A modified technique to locate the abutment screw access opening of a cemented implant-supported restoration. *J Prosthet Dent.* 2012; 108:58-59.

4) Hill EE. A simple, permanent index for abutment screw access for cemented implant-supported crowns. J Prosthet Dent 2007; 97:313-4.

5) Schwedhelm ER, Raigrodski AJ. A technique for locating implant abutment screws of
posterior cement-retained metal-ceramic restorations with ceramic occlusal surfaces.JProsthet Dent 2006; 95:165-7.

6)Lautensack J, Weber V, Wolfart S. Template to determine the position and angulation of the abutment screw channel for implant supported, cement-retained restorations. *J Prosthet Dent* 2012;107:134-36

7)Figueras-Alvarez O, Cedeño R, Cano-Batalla J, Cabratosa-Termes J. A method for registering the abutment screw position of cement-retained implant restorations. JProsthet Dent 2010; 104:60-2.

8)Daher T, Morgano SM. The use of digital photographs to locate implant

abutment screws for implant-supported cement retained restorations. J Prosthet Dent 2008; 100:238-9.

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9) Wadhwani C, Kwok-Hung Chung. Simple device to locate the abutment screw position of a cement retained implant restoration. J Prosthet Dent 2013; 109:272-274

10)Patil PG, Patil SP. Occlusal-view photograph of cement-retained implant prosthesis as a permanent guide for access-hole preparation. *J Prosthet Dent.* 2013;109(5):343-44.