

Evaluation of Basal Implant and Conventional Implants: A Comparative Study

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ABSTRACT

Background: Aim of this study is to clinically and radiographically compare the efficacy of basal implant versus conventional implant in relation to its stability, postoperative healing of hard and soft tissue.

Materials and methods: A prospective comparatively clinical study was performed in 5 patients in 20 implant (3 female and 2 males) requiring prosthesis for missing teeth mandibular followed by implant placed in each group in the Department of oral & maxillofacial surgery DJ college of dental science and research, Modinagar

Result: In our study we find the peri implantitis at 3 months in mean value of conventional implant is 2.5 and for basal implant it is 2.17 and P value is 0.04 which is significant. In the same manner in next 6 and 9 months conventional mean value at 6 months is 3.18 and at 9 months is 3.81.

Conclusion: In the present study, we clinically and radiographically evaluate the clinical efficacy of implant comparing between the conventional and basal. All the implants in our study were immediate loaded in 72 hours. All the conventional implant loaded 3 months after the placement. total of 5 edentulous patients and dentulous patients and 20 implants were included in the study. This was done with 3 months post implantation and 6 months post implantation and 9 months post implantation follow up.

Keywords: Basal implant, BOI implant, BCS implant.

INTRODUCTION

Implant supported prosthesis have open many possibilities of replacing lost tooth. Basal implants are endosseous aids to create osseointegrated points of retention for fixed or partial denture basal implantology also known as bicortical or justcortical implantology¹ It is a modern implantology system which utilize the basal cortical portion of the jaw bone it provides excellent quality of retention for basal implant. Basal implant use the rule of orthopaedic surgery so also called orthopaedic Implant² The traditional implants use the alveolar

bone this type of bone is lost after the teeth are removed and decreases throughout life. The basal bone is always present throughout life it is very strong and form the stress bearing part of our skeleton. This science already proved in orthopaedic implants (Hip/knee replacement).³ BCS (SCREW BASAL IMPLANT)-These are flapless implants and are inserted through gum, without giving a single cut, inserted like a conventional implant.⁴ They transmit masticatory deep into the bone, usually into the opposite cortical bone, while full osseointegration along the axis of the implant is

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not a prerequisite. BCS provide at least initially some elasticity and they are not prone to peri-implantitis due to their polished surface and their thin mucosal penetration diameter. ⁵Conventional implant-In 1952, Professor Per-Ingvar Branemark, a Swedish surgeon, while conducting research into the healing patterns of bone tissue, accidentally discovered that when pure titanium comes into direct contact with the living bone tissue, the two literally grow together to form a permanent biological adhesion. He named this phenomenon "*osseointegration*". In convention implant there are two stage procedures and may involve extra surgery, it also a time consuming and cost effective than basal implant. ⁶

So -Basal implantology is a new category of treatment with new broad indications and almost no limitations. Traditional concepts in oral implantology usually require all types of bone build up procedures for the subsequent installation of implants. Basal implantology does not include any augmentation. ⁷ In addition to that flapless approach with minimal surgical effort (thin mucosal penetration) minimizes postoperative pain, avoid any swelling and reduce discomfort, due to very less surgical procedure its also cost effective.

AIM & OBJECTIVE:

To aim of the study was clinically and radiographically compare the efficacy of basal implant vs Conventional implant in relation to its stability, post-operative healing of hard and soft tissue "

To Assess-

1. Inflammation.
2. Stability of implant clinically.
3. Amount of bone loss radiographically.
4. Peri implantitis.
5. Pain.

To compare operating time of both techniques

MATERIAL & METHODS

A prospective comparatively clinical study was performed in 5 patients in 20 implant (3 female and 2males) requiring prosthesis for missing teeth mandibular followed by implant placed in each group in the Department of oral & maxillofacial

surgery DJ college of dental science and research, Modinagar. This study was conducted on adults from local population requiring who were had partial edentulous and complete edentulous. Fulfilling all inclusive and exclusive criteria were included in this study. Patients prior to the commencement of implant surgery a detailed history of the patients was carefully recorded and patients were apprised about the potential risks and benefits and an informed consent was obtained on prescribed format.

SAMPLE SIZE

20 implants

Study will be conducted under two main groups namely:

- ❖ Group A-10 implant (basal)
- ❖ Group B-10 implant (conventional)

Inclusion Criteria.

- ✓ Willing to accept the conditions of the study and to give informed consent.
- ✓ No radiotherapy in head & neck area before 6 months .
- ✓ Patients above 16 years of age
- ✓ Patients with proper oral hygiene
- ✓ Adequate patients compliance
- ✓ Patients neurologically and hemodynamically stable enough to undergo a lengthy surgical procedure.

Exclusion criteria

- ✓ Any systemic disease that jeopardizes surgical treatment e.g. cardiovascular diseases, neuromuscular diseases, osteoporosis, uncontrolled diabetes.
- ✓ Psychological or psychiatric conditions that could influence the subjects reaction to treatment
- ✓ Acute or chronic symptoms of temporomandibular disorders
- ✓ History of radiation therapy to the orofacial region.
- ✓ Refusal of informed consent.
- ✓ Patients allergic to drugs and anesthetics.

METHODOLOGY

A Total of 20 implant in 10 patients were selected and randomly assigned to 2 groups

Group 1- 10 implant basal

Group 2- 10 implant conventional

After proper clinical examination, the impression of the patient was made using alginate impression material , cast was poured using dental stone and patients occlusion was determined both clinically and on cast . Orthopantomograph radiographs preoperative and post operatively using grid in all the case with radiographic safety precautions. using a pre operative orthopentomograph use length and width was assessed and tentative size was being determined .

All the patients were operated under aseptic conditions using sterile instruments and drapes. 2% lignocaine with adrenaline local anaesthetic was used in all cases. prior to surgery patients mouthwash rinsed using 2% chlorhexidine mouthwash .flap was raised using Molt no .9 periosteal elevator on buccal and palatal side .then using sequential drilling along with copious amount of cold saline irrigation the site was prepared less then the diameter of implant and also vertical drilling was done so at least 2 mm of the bone could be engaged by implant apex .The selected alpha bio implant was placed into the prepared site and tightened .After getting sufficient torque cover screw is placed into the site and tightened.

Case 1:

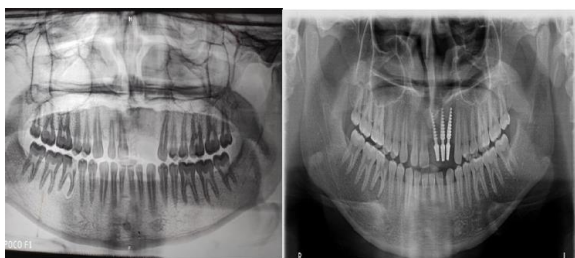


Fig 1: Preoperative and post operative orthopantomogram.



Fig 2: Preoperative photograph.



Fig 3: Postoperative photograph.



Fig 4: Post operative three month.

Case 2:



Fig 5: Incision given.



Fig 6: Use of pilot drill.



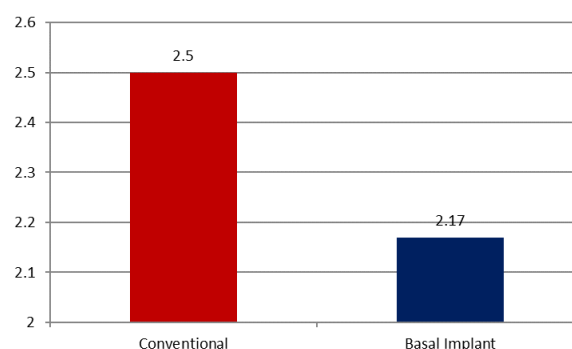
Fig 7: Implant placed.

RESULTS

The present study was conducted at Department of oral and maxillofacial surgery , D J college of Dental Sciences and Research, Modinagar to the study on“ **Evaluation of immediate loading Basal implant and conventional implants –A comparative study** evaluate clinical trail comparing basal implant and conventional implant . A total of 5 edentulous and partial edentulous patients and 20 implants were enrolled our study and were assigned into two groups equally. In GROUP -1 conventional implant and in GROUP-2 Basal implants. There is one implant failed in conventional group.

GROUP-1 –conventional implants 10 (one implant failed)

GROUP-2-Basal implants 10



Postoperatively the following parameters were evaluate for determining the better adjunct for soft tissue healing and hard tissue healing in implant placement by followed by immediate loading procedure.

- Pain and discomfort numeric pain rating scale
- Inflammation assessed 1st and 7th day by checking clinically
- Crestal bone loss chacked post op , 3 month ,6 month, 9 month using intraoral periapical radiograph with grid.
- Implant stability clinically at the time of place ment.

Table 1: Comparison Of Periimplantitis Between Two Groups At6 Months Tim Einterval.

GP	Mean	Std. Deviation	Std. Error Mean	P value	Significance
Conventional	3.18	0.593	0.209	0.043	Significant
Basal Implant	2.80	0.258	0.081		

Table 2: Comparison Of Pain Scores Between Two Groups At 1st Day And 7th Day.

	GP	Mean	Std. Deviation	Std. Error Mean	P value	Significance
1st Day	Conventional	4.00	0.000	0.000	0.001	Significant
	Basal Implant	8.00	0.000	0.000		
7 th Day	Conventional	1.33	1.154	0.666	0.213	Non-Significant

Table 3: Comparison of Inflammation Scores Between Two Groups At 1st Day And 7th Day.

	Conventional	Basal Implant	P value
1st Day	03 (100%)	02 (100%)	1.000 (Non-Significant)
7 th Day	00 (00%)	00 (00%)	1.000 (Non-Significant)

Table 4: Comparison Of Time Period Of Implant Placement Between Two Groups.

GP	Mean	Std. Deviation	Std. Error Mean	P value	Significance
Conventional	43.30	7.63	4.40	0.323	Significant
Basal Implant	30.00	14.14	10.00		

Table 5: Comparison of bone loss between the two groups.

	GP	Mean	Std. Deviation	Std. Error Mean	P value	Significance
3 rd Month	Conventional	1.7812	0.339	0.119	0.392	Non-Significant
	Basal Implant	1.6500	0.293	0.092		
6 th	Conventional	2.5000	0.534	0.188	0.714	Non-

Month	Basal Implant	2.4250	0.312	0.098		Significant
9 th Month	Conventional	3.4688	0.632	0.223	0.043	Significant
	Basal Implant	3.0250	0.184	0.058		

DISCUSSION

Over the years basal implants have been developed and improved in several stages by majorly the German and French dentists. The first single piece implant was developed and used by Dr. Jean-Marc Julliet in 1972 and has been used to this very day successfully, the only disadvantage is the lack of a surgical kit.⁹

In 1997 Dr. Stefan Ihde started manufacturing lateral basal implants like the Disk implants. Soon Dr. Stefan Ihde improved the basal implant vertical implant shaft were introduced, in 2005 screwable designs (BCS) were introduced.¹⁰

Peri-implantitis is a serious disease of multi-microbial inetiology affecting dental implant after placement. It is a wide prevalent disease account about 57%. It is caused by variety of Gram anaerobic bacteria. Risk factor involve in etiology of peri-implant disease are smoking, periodontitis and systemic disease . It involve Peri-implant mucositis a reversible inflammation of gingiva surrounding the dental implant and peri-implantitis a severe destructive disease of 7% prevalence by many studies. It affects surrounding soft and bone tissue and results in failure of osseointegration with consequent loss of dental implant .¹

Periimplantitis is the single most common cause for failure of conventional implants. This happens mostly because of the rough implant surface as well as the interface problems between the multiple parts of the implant. Judicious use of monobloc, smooth surface basal implants eliminate the threat of peri-implantitis by almost 98%.Because it has Polished surface Stops bacteria and plaque from adhering to the implant neck.²¹

Peri-implantitis is a real issue around crestal implants.Once a 'crestal' implant is inserted, it completely obturates the osteotomy site. Any infection carried into the bone intraoperatively or preoperatively can endanger the therapeutic result

considerably leading to an implant failure. Presumably, the prognosis of BCS implants is considered better because the blood supply to the bone remains undisturbed because of the 'skeletalized' endosseal implant fixture. It is assumed that the incidence of periimplantitis is very less compare to conventional implants due to smooth surface vertical component (no surface enlargement) of the implant which eliminates bacterial attraction. With integrated basal implants, infection originating in the oral cavity would not normally be expected to spread endosseously, for as long as the implants are not mobile to the extent that they can be intruded. In cases infections sets in because of improper hygiene or food retention, it spreads submucosally which is easier to treat rather than intra-osseously². In our study we find the peri implantitis at 3 months in mean value of conventional implant is 2.5 and for basal implant it is 2.17 and P value is 0.04 which is significant. In the same manner in next 6 and 9 months conventional mean value at 6 month is 3.18 and at 9 months is 3.81. Similarly in basal implant we find in 6 month 2.80 and in 9 months it is 3.15. The P value of 6 and 9 months is 0.043 and 0.001 which means the peri implantitis in basal implant is much less than conventional implant

The basal implants provide excellent primary stability along the vertical surface of these implants with no need for corticalization. So, the basal implants are well suited not only for immediate loading but also for immediate placement. (Werner and Thomas, 2005) In anterior maxillary region, four basal implant were placed. The implant offers the advantages of not requiring flap elevation (no open surgical procedure is necessary), can be carried out in a single sitting, and can be immediately loaded as well. (Stefan, 2005; Thomas Fabritius, 2007) The basal implants are single-piece implants with an apical compression thread. The compression screw design facilitates immediate prosthetic loading¹⁵.

Under local anesthesia one piece basal implant inserted with flapless technique after the pilot drill. During the placement of the implant the torque achieved is more than 50 Nm which is required torque⁴. In our study the pairwise comparisons of stability in basal group at time of insertion $51.00 \pm$ and conventional 35.50 ± 2.838 and p value is 0.00 is

significance so basal implant is more stable than conventional implants.

he concept of immediately loading implants has been well documented in the literature. The maxillary arch poses difficulties for immediate loading than mandible. The presence of type III and IV bone predominantly as well as the presence of the maxillary sinus makes the prognosis of immediate loading implants rather questionable in the posterior maxilla. Basal implants which are inserted laterally, can be loaded immediately which shows adequate anchorage and osseointegration in completely edentulous maxilla².

Prosthesis is fixed within 72 hours of implant surgery saving time and costs considerably. In case of conventional implants associated with bone augmentation / grafting procedures, the total treatment time will be about 6 months to 1 year. The need for interim dentures / provisionals is totally eliminated. The basal implant procedures are less time consuming. Moreover being a single piece implant, the strength provided by the implant is excellent as there is no separate root portion and abutment portion¹⁵.

In our study the pair wise comparison of time in conventional implant 43 ± 7.63 and for basal implant 30.00 ± 10.00 and p value is 0.323 is significant so basal implants take less time to insert in compare to conventional implant.

Single piece screw type implants can be inserted in a minimally invasive fashion – often flapless and involving minimum bone cutting. Being minimally invasive, they are also associated with minimum post operative inflammation and healing at procedure sites are rapid and often non eventful²¹.

CONCLUSION

In the present study, we clinically and radiographically evaluate the clinical efficacy of implant comparing between the bconventional and basal. All the implants in our study were immediate loaded in 72 hours. All the conventional implant loaded 3 month after the placement. total of 5 edentulous patients and dentulous patients and 20 implants were included in the study. This was done with 3 months post implantation and 6 months post

implantation and 9 months post implantation follow up.

Patient post operative pain is clinically measured using Wong bakers face pain rating scale. Objective measurements of implant stability insertion torque. Radiographically marginal bone loss mesially and distally is done by using grid IOPA. The collected data was then analysed statistically and compared in two groups by 2-way ANOVA and Paired t-test.

CONFLICTS OF INTEREST

The authors declare they have no potential conflict of interests regarding this article.

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