



## Cortico-basal Implants – The Ultimate Rescuer

Authors

**Dr Nandan Rudra Paul<sup>1</sup>, Dr Amrita Samanta<sup>2</sup>, Dr Shyamanand C.<sup>3</sup>**

<sup>1</sup>Associate Professor, Department of Oral and Maxillofacial Surgery and Implantology, The Oxford Dental College, Bangalore, India.

<sup>2</sup>Assistant Professor, Department of Oral and Maxillofacial Pathology, The Oxford Dental College, Bangalore, India.

<sup>3</sup>General and Aesthetic Dentist, Mahanam Multispeciality Maxillofacial & Dental Clinic, Bangalore, India  
Corresponding Author

**Dr Nandan Rudra Paul**

Associate Professor, Department of Oral and Maxillofacial Surgery and Implantology, 10<sup>TH</sup> Milestone, Hosur Road, Bommanahalli, Bangalore -560068, India.

### Abstract

*Immediately loaded, implant supported prosthesis is a novel advancement in oral implantology. Cortico-basal implants has the versatility and durability with reduced treatment time. These implants work on the principle of osseo-fixation, however, osseointegration of the implants eventually happens over a time period.*

*Cortico-basal implant supported prostheses came to the rescue, in our following cases, where a cortico-basal implant was placed in between 2 fractured, well osseo-integrated conventional implants. Another case with large periapical cyst encroaching into the right maxillary sinus floor enucleated with the involved teeth leading to an oro-antral communication, closed surgically. Cortico-basal implants were placed bypassing the right sinus floor to restore the function. In another case of failed multiple endodontically restored teeth and even endosseous implants, cortico-basal immediate loading prostheses were placed to successfully restore both the jaws.*

*Cortico-basal implant supported prostheses is a graft less procedure with minimized chair side time, having optimum peri-implant soft tissue health, durable, with high success rate and are gradually emerging as a promising alternative in dental rehabilitation cases. Strategic implant placement of the cortico-basal implants has proved to be the ultimate rescuers in certain circumstances.*

**Keywords:** Corticobasal, Endosseous, Implants, Osseofixation, Osseointegration.

### Introduction

Oral rehabilitation is crucial to enhance function and aesthetics in patients with missing tooth/teeth. Immediate loading implant supported prostheses

are a remarkable evolution in the realm of implant dentistry.<sup>1</sup> Reduced treatment time, safe and efficient treatment and enhanced standard of the rehabilitative procedures has made the cortico-

basal implants a popular option.<sup>2</sup> These implants are osseo-fixated in the cortical bone regions eventually using them in an immediate loading engagement. This establishes a bone-implant prosthetic system (BIPS).<sup>3</sup> Replacement of missing teeth with dental implants are in the limelight in modern day dentistry. Achievement of stability is obtained by strategic implant placement engaging the second or third cortical bone so that both intrusive and extrusive forces are effectively transmitted.<sup>4</sup> The bone osseos adapts itself on the implant surface with continuous remodeling depending on the subjected load over it.<sup>5</sup> Advancement in design, less surgical intervention and complimentary prosthetics has made cortico-basal implants the treatment of choice in many dental practices.<sup>6</sup>

## Case Series

### Case 1

A 45-year-old patient reported to our dental practice with a fractured porcelain fused to metal bridge. He gave a history implant placement in his right lower back region of mouth from where the fractured bridge was obtained. Clinically the fractured implants were visible. His intra oral periapical radiograph revealed two endosseous implants in the region of mandibular right first and second molar, both fractured at the neck area of the implants, at the level of internal hex (Figure 1). To respect the patients' wishes and to avoid long surgical intervention of removing the fractured implants, followed by grafting, we placed a single cortico-basal implant in between the two fractured endosseous implants. Elastomeric impression was made post implant placement and prostheses were delivered and fixed intraorally using glass ionomer cement on the stipulated time (Figure 2). On five years follow up the patient is doing well with the prostheses. Thus, the cortico-basal implant has emerged as a rescuer in this case.



**Figure 1:** Radiograph of the broken implants in the region of 46 and 47.



**Figure 2:** OPG after prosthetic rehabilitation

### Case 2

A 62-year-old male patient reported to our practice with pain on chewing in the right upper back region of mouth. On clinical examination, tenderness on percussion was noted in maxillary right second premolar, maxillary right first molar and maxillary right second molar. An OPG was advised which revealed the presence of a large periapical cyst encroaching upon the right maxillary sinus. The involved teeth, maxillary right second premolar, maxillary right first molar and maxillary right second molar were extracted followed by surgical removal of the cyst which was partly involving the right maxillary sinus (Figure 3). This led to an oro-antral communication which was confirmed with a Mouth mirror test and Valsalva test. The patient was informed about the same. Buccal advancement flap soft tissue closure was done to repair the oro-antral communication and sutured in place with 3-0 BBS (Black Braided Silk). On follow up visit after seven days an OPG revealed only soft tissue closure at the surgical site. Cortico-basal implants were planned by careful assessment to restore the masticatory function and esthetics for the patient who refused to wait further for 3 more months until bone healing is complete. Cortico-basal implants were placed with

Careful planning while bypassing the right sinus floor (Figure 4). Elastomeric impression was made on the same day. Metal trial of the prostheses were done followed by prostheses fixation using a hard and fast setting glass ionomer cement, GC Fuji plus Type I, a couple of days later. Patient reported for follow up with no further complications 1 month later.



**Figure 3:** Surgical removal of the periapical cyst encroaching upon the right maxillary sinus.



**Figure 4:** Cortico-basal implants bypass the sinus floor.

### Case 3

A male patient aged 42 years reported to our dental clinic with multiple missing teeth. On clinical examination, root stumps were noted on the anterior maxilla, edentulous posterior maxilla on both sides, clinically visible implant abutments in the region of maxillary right first molar, mandibular left first molar and mandibular right first molar were found. Posterior mandible was also edentulous on both the sides. Patient was apprehensive because of numerous failed dental treatments and visited us with much hope. An OPG was advised to assess his condition conscientiously. The OPG revealed failed endodontically treated teeth with respect to maxillary right central incisor, maxillary right

lateral incisor, maxillary right canine, maxillary right first premolar and maxillary left canine. Endo-osseous implant in the region of maxillary right first molar. All other teeth in the maxillary arch are missing. Endo-osseous implants are present in the region of mandibular left first molar and mandibular right first molar. Crater-like bone loss was noted around the implant in the mandibular right first molar region. We explained our treatment protocol to the patient and his family and obtained their consent. Mandibular left first premolar, mandibular right canine and mandibular right first premolar were endodontically treated. All the teeth with poor prognosis were extracted. On the same day, total of seventeen cortico-basal implants were placed (Figure 5). Pterygoid implants were placed using an angled handpiece. Immediate loading prostheses were fabricated and oral rehabilitation was completed within five days (Figure 6). Patient is happy with his new teeth in place and restored functions. Intraoral bleaching was done a week later after the delivery of the prostheses to match the color of his existing natural teeth in the mandibular anterior region with that of the prostheses.



**Figure 5:** OPG reveals the strategic placement of cortico-basal implants and endodontic treatment of 34, 43 and 44.



**Figure 6:** Oral rehabilitation completed within the stipulated time frame.

## Discussion

The mainstay for cortico-basal implants gaining popularity among the dentists and the patients because they reduce considerable amount of chairside time for functional loading and are minimally invasive. The post-operative pain, swelling and discomfort are insignificant. The smooth polished surface of these implants prevents peri-implantitis.<sup>3</sup> However, the ultimate successful oral rehabilitation using corticobasal implants depends on various medical conditions, patient compliance and extensive follow up.

Orthopantomogram (OPG) is the primary adjunct during the treatment planning and post-operative procedure of implant placement and in all our cases we have considered the OPG to be a vital investigative tool. The OPG has efficiently helped us in implant size selection in all our cases.

Connecting and stabilizing multiple implants either with syncrystallization or using a metal framework ensures even force distribution and thereby reduce the stress build up on the implants, preventing their failures.<sup>1</sup> In all our three cases we have used metal framework for implant stability and the follow up results are satisfying.

The pre-operative anatomical positional assessment of implant placement is essential for implant survival and we have effectively respected the anatomy during our implant surgical procedure with convincing results. Anchorage of cortico-basal implants is achieved in the second and third cortical plates bypassing the alveolar bone and multidirectional implant placement helps to obtain maximum stability as all extrusive and intrusive forces are disseminated into the cortical bones.<sup>4</sup> We have followed these consensuses put forward by Antonina et al. in 2020 in all our cases. Anti-rotation of the mandibular implants in our cases have been obtained by bending the implant shaft in accordance to the consensuses by Antonina et al. 2020.

In all our cases we have used porcelain fused to metal prostheses which helped us to achieve multi-implant stabilization and rehabilitation.

## Conclusion

The limited limitations in placement and thin mucosal penetration have made basal implantology a more advanced choice by the dentists all over the world. Strategic implant placement is the key to the successful outcome of cortico-basal implants and in turn significantly improves the quality of life of the patients. The patient satisfaction with improved aesthetics, phonetics, mastication and comfort in a short span of time had proved to be the ultimate rescuer.

## Conflict of Interest

The authors had no conflict of interest to declare.

## Financial Disclosure

The authors declared that they have received no financial support.

## References

1. Awadalkreem F, Khalifa N, Satti A, *et al.* Rehabilitation of Patients with Compromised Ridge Support Using Immediately Loaded Corticobasal Implant-supported Protheses: A Prospective Observational Study. *J Contemp Dent Pract* 2022;23(10):971–978.
2. Chakranarayan A, Soni P, Kapri A, Kumar R. Effectiveness of strategic corticobasal implants in the management of edentulism. *IP Ann Prosthodont Restor Dent* 2020;6(2):77-86.
3. Ihde S. Indications and treatment modalities with corticobasal jaw implants. *Ann Maxillofac Surg* 2019;9:379-86.
4. Antonina I, Lazarov A, Gaur V, Lysenko V, Konstantinovic V, Grombkötö G, *et al.* Consensus regarding 16 recognized and clinically proven methods and sub-methods for placing corticobasal® oral implants. *Ann Maxillofac Surg* 2020;10:457-62.
5. Patel K, Madan S, Mehta D, Shah SP, Trivedi V, Seta H. Basal implants: An

asset for rehabilitation of atrophied resorbed maxillary and mandibular jaw – A prospective study. *Ann Maxillofac Surg* 2021;11:64-9.

6. Pathania N, Gill HS, Nagpal A, Vaidya S, Sailo JL. Basal implants – A blessing for atrophied ridges. *IP Ann Prosthodont Restor Dent* 2021;7(1):16-21.