



The Evolution of Strategic Implantology: Achieving Fixed Teeth in 72 Hours

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Abstract

Basal implantology, also referred to as corticobasal implantology, strategic implantology, or bicortical implantology, is an advanced implant rehabilitation concept that utilizes the dense cortical bone of the maxilla and mandible for implant anchorage rather than the resorbable alveolar bone. Basal implants achieve primary stability through osseofixation in the cortical bone. This principle enables immediate functional loading, often within 72 hours, while avoiding additional procedures such as sinus floor elevation, guided bone regeneration, and block bone grafting.

The concept of basal implantology has evolved considerably since the development of the first single-piece implant by Dr. Jean-Marc Julliet in 1972. Subsequent innovations by Dr. Gérard Scortecchi and Prof. Stefan Ihde led to the development of modern Basal Osseointegrated (BOI), Basal Cortical Screw (BCS), and KOS implant system. This review summarizes the biological basis, historical development, biomechanical principles, implant designs, surgical protocols, indications, contraindications, prosthetic considerations, and current clinical evidence related to basal implantology. Recent advances in digital implant planning, CAD/CAM prostheses, and finite element analysis are also discussed.

Keywords: Basal implantology, Corticobasal implant, Bicortical implant, BOI implant, BCS implant, Immediate loading, Osseofixation, Strategic implantology, Cortical bone.

Introduction

Dental implant therapy has become the preferred treatment modality for replacing missing teeth because of its predictable long-term success and ability to restore function and aesthetics. Conventional endosseous implants rely primarily on adequate alveolar bone volume and osseointegration, often necessitating additional augmentation procedures such as sinus floor elevation, guided bone regeneration (GBR), block bone grafting, or distraction osteogenesis in patients with severe alveolar ridge resorption. These procedures increase treatment duration, cost, and patient morbidity.[1]

Basal implantology, also known as corticobasal implantology, bicortical implantology, or strategic implantology, has emerged as an alternative treatment concept that utilizes the dense cortical and basal bone for implant anchorage. Unlike conventional implants, basal implants derive their primary stability through engagement of highly mineralized cortical bone, permitting immediate functional loading while avoiding extensive bone augmentation procedures.[1]



Evolution of Basal Implantology

The concept of basal implantology originated in 1972, when Dr. Jean-Marc Julliet introduced the first single-piece implant consisting of a threaded pin connected to a basal plate. Although innovative, the implant lacked a dedicated surgical kit, limiting its widespread clinical use. [1]

In 1975, Dr. Clunet Coste patented a T-shaped implant incorporating similar design principles. This design remained protected under a French patent until 1996. [1]

The concept was significantly refined during the mid-1980s by Dr. Gérard Scortecchi, who introduced the Disk Implant System (Disk implants) along with specialized surgical instruments and prosthetic connectors. Scortecchi is widely regarded as one of the pioneers of modern lateral implantology. [1]

Further developments occurred in 1997, when Stefan Ihde introduced rough-surfaced lateral basal implants to improve retention. However, subsequent investigations demonstrated crater-like bone loss around roughened vertical implant shafts. Consequently, by 2000, polished-surface implants replaced rough-surfaced designs, significantly reducing crestal bone loss and improving long-term tissue stability. [1]

Further design modifications included the addition of anti-rotational edges to basal discs and the introduction of Basal Cortical Screw (BCS) implants in 2005, followed by the King of Compression Screw (KOC) system, which further simplified implant placement while enhancing primary stability. [1]

Biological Basis of Basal Implantology

The fundamental principle of basal implantology is the utilization of the basal cortical bone, which possesses superior mechanical and biological characteristics compared with alveolar cancellous bone.

Basal bone:

- is highly mineralized
- has greater density
- demonstrates minimal physiological resorption
- possesses superior vascularity
- is resistant to periodontal infection
- remains stable even after long-term tooth loss.

Unlike conventional implants that depend on osseointegration with cancellous alveolar bone, basal implants obtain immediate stability by osseofixation, a mechanical anchorage within the cortical plates. This closely resembles orthopedic fracture fixation (AO principles), allowing immediate functional loading without waiting several months for osseointegration.

Biomechanical studies have shown that cortical bone exhibits a significantly higher elastic modulus than cancellous bone, enabling it to withstand greater occlusal forces with minimal deformation.

Ivanoff et al. (1996) experimentally demonstrated that bicortically anchored implants exhibited nearly twice the removal torque after six weeks and three times higher removal torque after twelve weeks compared with monocortical implants, supporting the superiority of bicortical fixation.[2]

Types of Basal Implants

Basal implants are broadly classified into two categories:

1. Basal Osseointegrated Implants (BOI)

BOI implants, also called lateral disk implants, are inserted through the lateral cortical plate after creating a T-shaped osteotomy. The implant contains one or more basal disks that engage dense cortical bone.

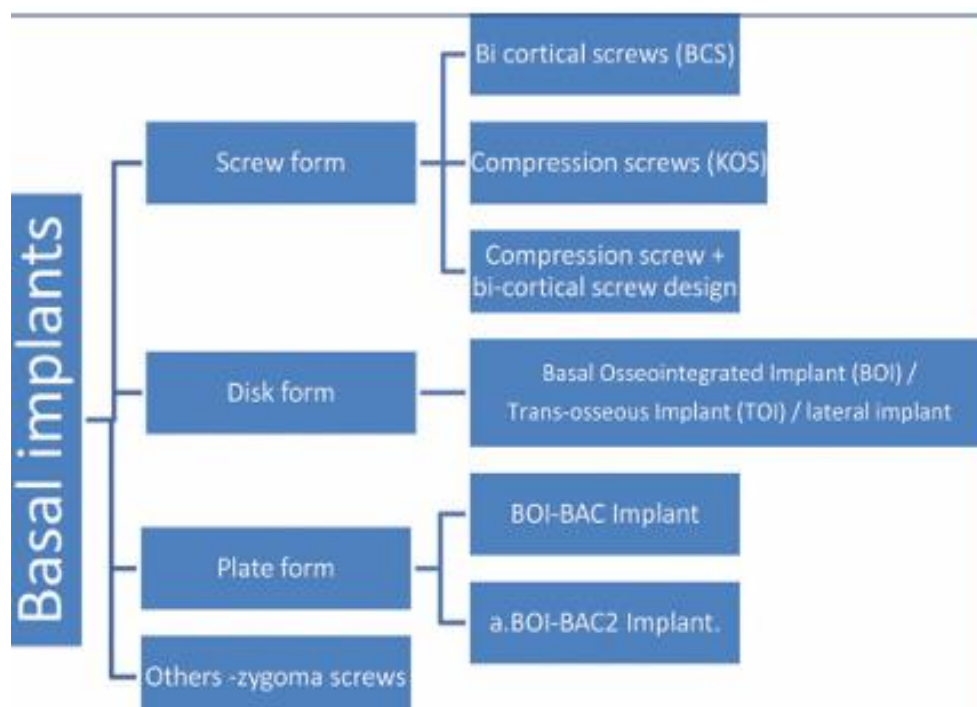


Fig.1 Classifications of Basal Implants

Characteristics include:

- lateral insertion technique
- polished implant surface
- immediate loading capability
- high resistance to peri-implant inflammation.

Earlier BOI implants incorporated two discs:

- basal disc (9–10 mm diameter)
- stabilizing disc (approximately 7 mm diameter)

2. Basal Cortical Screw (BCS)

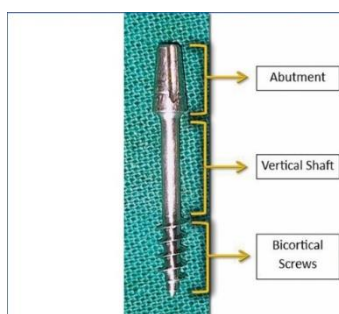


Fig. 2 Bicortical screw implants

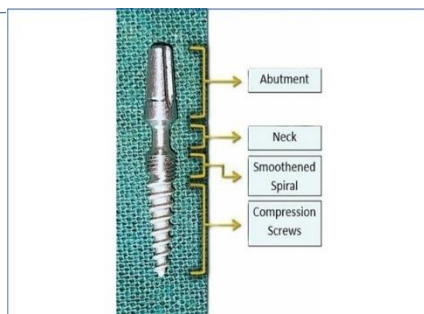


Fig. 3 KOC (King of Compression) implants

BCS implants are screw-type one-piece implants designed for bicortical engagement. Features include:

- insertion through a crestal approach
- placement immediately after extraction
- thread diameter extending up to approximately 12mm
- engagement of multiple cortical plates.

BCS implants eliminate the need for lateral osteotomy and simplify surgical procedures while maintaining excellent primary stability.

Surgical Technique

Basal implant surgery differs considerably from conventional implant placement.

For BCS, KOS (King of Compression) of Single Piece Implant), and KOS Plus implants, a single pilot osteotomy using a Pathfinder drill is generally adequate. Manual drills allow controlled preparation while minimizing heat generation. [1]

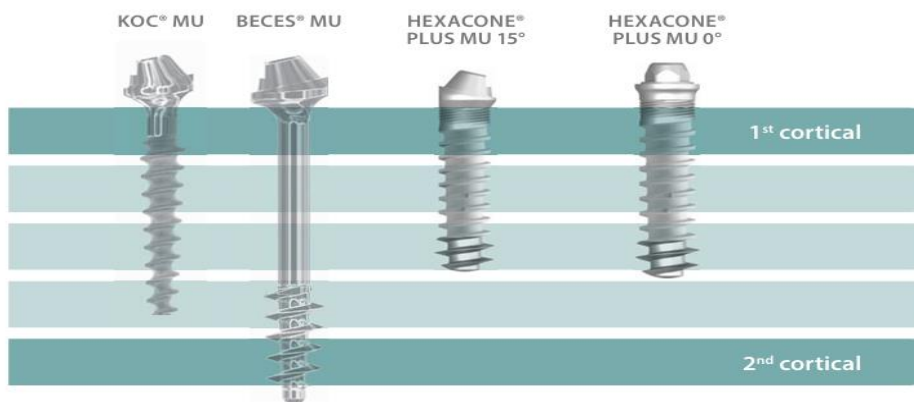


Fig. 4 – The image displays four type of dental implants including the KOC MU, BECES MU, HEXACONE PLUS MU 15°, HEXACONE PLUS MU 0° models. The blue bands highlight where the implants grip the dense bone leveled as 1st cortical and 2nd cortical layers. It showcases different thread designs, lengths and head angles (0° to 15°) used for multiunit restorations.

Important surgical principles include:

- minimal bone drilling
- external irrigation
- flapless or minimally invasive surgery whenever possible
- preservation of periosteal blood supply
- immediate loading within 72 hours.

In contrast, BOI implants require elevation of a lateral mucoperiosteal flap. A T-shaped osteotomy is prepared using disk drills, after which the implant is inserted laterally and the flap repositioned.

[1]

Multiple clinical trials have successfully employed these techniques with favorable survival rates.

BIOMECHANICAL PRINCIPLES

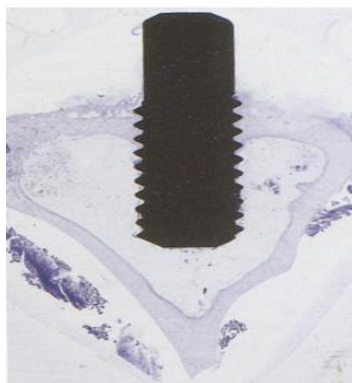


Fig. 5 Mono-cortical Implant



Fig. 6 Bicortical Implant

Basal implants derive their stability from bicortical anchorage.

According to Ihde's "1-2-3 Cortical Concept", implant stabilization occurs through engagement of the second and third cortical plates, while the prosthetic abutment emerges through the first cortical. [3]

The supporting polygon concept advocates strategic placement of three to ten implants to maximize biomechanical stability and distribute occlusal forces evenly across the basal skeleton. [3]

The Supporting Polygon Concept [13-15]

Rather than attempting to rebuild missing alveolar bone, implants are placed in strategic, highly stable anatomical positions to create a broad geometric foundation.

- **In the Maxilla:** Implants engage the posterior sinus wall, the pterygoid plates, and the nasal spine.
- **In the Mandible:** Implants utilize the dense cortex of the symphysis anteriorly and the mylohyoid undercut posteriorly. This polygon configuration distributes forces evenly across sagittal and transverse planes, dramatically reducing leverage, flexural stress, and extra-axial loading on individual implants.

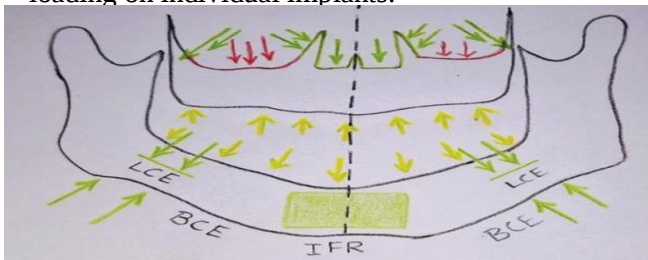


Fig.7:-Schematic overview on the corticals in connection to the maxilla & mandible. Yellow arrows-1st corticals; Green arrows-2nd corticals; Red arrows- resorption prone areas; LCE- Lingual cortical engagement; BCE- Basal cortical engagement; IFR- Inter-foraminal region

Unlike conventional implants that concentrate stress within the crestal bone, basal implants transmit occlusal forces into the deeper basal cortices, reducing crestal overload and minimizing marginal bone.

INDICATIONS:

Basal implants are particularly useful in patients with compromised alveolar bone, includes:

- * Complete and partial edentulism
- * Severely resorbed maxilla or mandible
- * Failed conventional implants
- * Inadequate bone for conventional implant placement
- * Patients unwilling or unsuitable for bone grafting
- * Immediate implant placement following extraction
- * Full mouth rehabilitation
- * Medically compromised patients
- * including controlled diabetics and smokers
- * Patients requiring immediate function.

CONTRAINDICATIONS:

- * Severe osteoporosis
- * Osteomyelitis
- * Jaw vascular malformation
- * Compartment syndrome
- * Active malignancy
- * Severe soft tissue infections
- * Uncontrolled inflammatory lesions
- * Patients receiving intravenous bisphosphonate therapy



- * Conditions compromising local blood supply
Since bisphosphonates remain within bone for prolonged period, implant placement should be carefully evaluated or postponed.

CLINICAL ADVANTAGES:

- * Basal implantology offers several important advantages over conventional implant therapy. These include:
- * Immediate functional loading within 72 hours
- * Elimination of bone grafting
- * Reduce treatment duration
- * Lower treatment cost
- * Minimal postoperative morbidity
- * Superior primary stability
- * Utilization of infection-resistant basal bone
- * Reduced risk of peri-implantitis
- * Suitability for extraction sockets
- * Preservation of cortical blood supply
- * Improved patient acceptance.

Because the implant neck possesses a narrow polished emergence profile, bacterial colonization around the crestal region is minimized, thereby reducing inflammatory complications.

CLINICAL EVIDENCE

Numerous clinical studies have demonstrated encouraging outcomes.

- Garg et al. (2017) reported favorable survival of immediately loaded basal implants over three years, confirming reliable primary stability through cortical engagement. [4]
- Ole et al. (2019) evaluated 4,570 immediately loaded one-piece implants in 394 patients and concluded that implant survival was similar in fresh extraction sockets and healed ridges. [5]
- Ward et al. (2020) demonstrated predictable immediate placement of basal implants in maxillary premolar extraction sites, where retained periodontal ligament fibers facilitated rapid healing. [6]
- Pate et al. (2021) further confirmed successful rehabilitation of severely resorbed jaws using basal implants without bone augmentation. [7]

Case reports have expanded the applications of basal implants beyond routine rehabilitation. Konstantinovic et al. successfully retained a nasalepithesis using basal implants after midfacial tumor resection, [8] while Ahmad et al. reported successful full-mouth rehabilitation of a patient with cleidocranial dysplasia using immediately loaded basal cortical screw implants. [9]



PubMed	Inclusion criteria		Results	
	5 years		20	
	Languages (English, Spanish, Portuguese)		20	
	Free access.		20	
	Systematic reviews, meta-analysis, RCTs, case reports.		20	
Academic google	Inclusion criteria		Results	
	5 years		18,100	
	Languages (English, Spanish, Portuguese)		9,480	
	Free access.		9,480	
	Systematic reviews, meta-analysis, RCTs, case reports.		168	
ProQuest	Inclusion criteria		Results	
	5 years		3,042	
	Languages (English, Spanish, Portuguese)		3,009	
	Free access.		2,999	
	Systematic reviews, meta-analysis, RCTs, case reports.		2,883	
Scopus	Inclusion criteria		Results	
	5 years		31	
	Languages (English, Spanish, Portuguese)		31	
	Free access.		31	
	Systematic reviews, meta-analysis, RCTs, case reports.		28	
Exclusion/selection criteria	Search engines	Results	Repeated	Total
	Pubmed	13		13
	Academic google	17	1 Pubmed 3 Scopus	13
	ProQuest	12		12
	Scopus	18	2 Pubmed 5 google academic	11

Table. 1 Flowchart of the Systemic review of Literature

BIOMECHANICAL EVIDENCE

Experimental investigations have consistently supported bicortical anchorage.

- Johansson and Albrektsson demonstrated a direct relationship between bone-to-implant contact and implant removal torque. [10]
- Sennerby et al. reported superior biomechanical performance of implants placed within cortical bone compared with cancellous bone. [11]
- Ivanoff et al. confirmed significantly higher removal torque values and greater bone contact in bicortically anchored implants, providing strong experimental support for the clinical use of cortical bone basal implantology. [2]

AWARENESS AMONG DENTAL PRACTITIONERS

Despite increasing scientific evidence supporting basal implantology, clinical adoption remains limited.

A questionnaire survey conducted among 200 general practitioners in Maharashtra reported that 65.5% were of bicortical implant placement, limited where only 29.3% had actually incorporated the technique into clinical practice. Approximately 51.7% considered it a promising treatment option for future prosthodontic rehabilitation, while 32.8% remained uncertain regarding its clinical applicability. [12]



These findings highlight the need for enhanced educational programs and clinical training to improve awareness and acceptance of corticobasal implantology.

Summary

Basal implantology represents a significant advancement in implant dentistry by utilizing dense cortical bone rather than resorbable alveolar bone for implant stabilization. The technique enables immediate loading, avoids complex augmentation procedures, shortens treatment duration, and provides excellent biomechanical stability. Numerous clinical and experimental studies have demonstrated favorable survival rates, high primary stability, and predictable outcomes even in severely atrophic jaws. Although widespread clinical adoption remains limited due to the specialized surgical protocol and training requirements, current evidence suggests that corticobasal implantology is a reliable treatment option for full-mouth rehabilitation and patients with compromised bone conditions. Further long-term randomized controlled trials are recommended to strengthen the evidence base and establish standardized treatment protocols.

CONCLUSION

For the modern patient seeking a rapid, reliable return to a normal quality of life, the ability to secure a fixed prosthesis safely within 72 hours represents a significant leap forward in dental medicine.

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