



## Immediate Rehabilitation of Post Traumatic Tooth Loss Using Cortico-Basal Implants: A Case Report

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### Abstract

Tooth avulsion, particularly in the anterior esthetic zone, presents both functional and esthetic challenges. Traditional prosthetic and implant-based methods may require invasive surgeries, particularly in patients with alveolar bone loss. Basal implantology provides a viable alternative by utilizing the basal cortical bone for anchorage, allowing immediate loading and avoiding grafting procedures. This case report details the use of cortico-basal implants to rehabilitate mandibular anterior tooth loss in a patient with post-traumatic bone loss.

**Keywords:** Basal implants, single-piece implants, tooth avulsion, immediate loading, trauma rehabilitation

### Introduction

Approximately 0.5–3% of all traumatic injuries to permanent dentition are avulsions, which are defined as the complete loss of a tooth from its socket. The maxillary central incisors are most commonly affected, followed by the maxillary lateral and mandibular central and lateral incisors. Multiple avulsions are often associated with significant trauma, such as road traffic accidents or assaults, and typically involve both hard and soft tissue injuries. Anatomical and esthetic concerns related to rehabilitation include the condition of the buccal bone plate and the urgent need for esthetic prosthetic replacement.

Traditional replacement methods include removable and fixed prostheses [1,2]. However, in cases of severe ridge resorption, these can be compromised by poor retention, instability, mastication difficulties, speech impairment, and patient dissatisfaction [3,4]. Implants are considered the gold standard for replacing missing teeth. However, alveolar bone atrophy following trauma or extraction complicates conventional implant placement due to insufficient ridge dimensions

[5,6,7,8]. Bone augmentation procedures such as guided bone regeneration are invasive, costly, time-consuming, and may result in prosthetic or functional compromise [9].

Basal implantology (bicortical implantology) utilizes the basal cortical bone, which offers high-density support and is less prone to resorption. Basal implants are engineered for placement in this bone, allowing immediate functional loading [10,11]. These implants follow orthopedic principles and are sometimes referred to as "orthopedic implants" due to similarities with joint replacements where immediate use is encouraged post-surgery [12].

Unlike conventional implants that rely on alveolar bone, basal implants utilize basal bone, which remains stable throughout life. The first single-piece implant system was developed by Dr. Gerard Scortecchi (Diskimplants), later advanced by Dr. Stefan Idhe with the development of basal osseointegrated implants (BOIs). Basal implants avoid the need for bone

grafting and offer anchorage in bone that is less susceptible to infection [13].

### Case Presentation

A 43-year-old male reported with a chief complaint of missing lower front teeth following facial trauma due

to an assault 25 days earlier. He also reported pre-existing mobility in the same teeth before the trauma. Clinical examination showed missing teeth 41 and 42. Radiographic analysis confirmed bone loss in the area, supporting the history of pre-existing periodontal disease.



**Intraoral photograph showing missing 41,42 teeth.**



**Pre-op sectional radiograph reveals radiolucency indicative of the recently avulsed teeth .**

Treatment options discussed included conventional implants with bone augmentation, a tooth-supported fixed prosthesis, and cortico-basal implant-supported prosthesis. The patient opted for cortico-basal implants due to reduced treatment time and lower cost.

### Surgical Procedure

Following administration of local anesthesia (2% lignocaine with adrenaline), two rough-surfaced, single-piece cortico-basal implants ( $3.2 \times 17$  mm, Mono Implant) were placed using a flapless technique.

Osteotomy was performed using a single drill, and implants were inserted with high primary stability. Abutments were adjusted to the arch form. The procedure was bloodless and suture-free.

An impression was taken immediately using alginate, followed by bite registration. The patient was prescribed antibiotics and analgesics. A metal try-in was conducted after two days to assess occlusal clearance and marginal adaptation. The final

prosthesis, a porcelain-fused-to-metal (PFM) crown, was cemented on the following day.



**Immediate post-operative photograph showing 2 single piece corticobasal implants in relation to tooth number 41,42.**



**Immediate post-op radiograph showing 2 single piece implants**



**Fixed prosthesis cemented over single piece implant**

## Discussion

Single-piece basal implants simplify treatment in patients with compromised bone anatomy, eliminating the need for bone augmentation. They enable immediate prosthetic loading, are cost-effective, and reduce overall treatment time. Their design prevents the formation of microgaps between the abutment and implant body, minimizing microbial colonization and peri-implantitis [13].

Prithivraj et al. reported a strong preference among clinicians for immediate loading protocols using single-piece implants [14]. Lazarov et al. found a 97.5% cumulative survival rate over four years for cortically anchored basal implants, even with simultaneous tooth extractions [15]. Long-term data support their effectiveness in preserving crestal bone levels and biological width, which are crucial for periodontal health [16].

Fadia et al. observed significant improvements in patient satisfaction concerning esthetics, comfort, mastication, and speech [17]. Basal implants have also proven effective in complex cases such as:

1. Single-tooth replacement in patients with hyperdense lesions [18]
2. Full-mouth rehabilitation in cleidocranial dysplasia [19]
3. Post-marginal mandibulectomy reconstructions [20]
4. Mandibular reconstruction after gunshot injuries [21]

## Conclusion

Basal implants are an ideal solution for patients with compromised alveolar bone and high esthetic demands, especially in trauma cases. They eliminate the need for grafting procedures, provide immediate functional loading, and yield excellent esthetic results with reduced treatment complexity. This case illustrates their effectiveness in managing anterior tooth loss in a minimally invasive, time-efficient manner.

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