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## Case Report

## The story of the teeth which were lost and resurrected in black and white- A case report

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## ABSTRACT

Deficient bone is an impediment for implant placement in many patients. In this case report a patient reported with missing teeth in mandibular left back teeth region. The alveolar bone was severely resorbed with reduced occlusal clearance making prosthetic restoration with implants impossible. The objective here was bone regeneration and placement of implants in the area for restoration of function. A resorbable collagen membrane along with mineralized freeze dried bone grafting was used to gain alveolar ridge. After seven months two implants were placed following the delayed protocol achieving a good primary stability. Implant uncovering was carried out after five months with placement of a gingival former. This was followed by placement of a 2-unit crown in Porcelain fused to metal (PFM) which helped the patient in mastication. Thus alveolar ridge regeneration followed by implant placement is a viable treatment option provided the clinical scenario is ideal.

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## 1. Introduction

Implants are an integral part of treatment for missing teeth and they have been in the field for more than three decades. But they are not an option in all clinical situations and have some prerequisites like adequate residual hard and soft tissues, reduced proximity with nerves and blood vessels, absence of parafunctional habits and patients who are systemically healthy. Fixed prosthesis requires teeth adjacent to edentulous space with optimal bone levels. Removable prosthesis due to its encumberant disadvantage like lack of stability is the least preferred option. Edentulism has its own consequences like ridge resorption, migration of adjacent teeth, extrusion of opposing teeth and the resultant reduced occlusal dimension. Most important of all is the psychological impact on the patient which can be quite devastating. Thus every attempt should be made to develop the edentulous site for implant placement.

## 2. Clinical Procedure

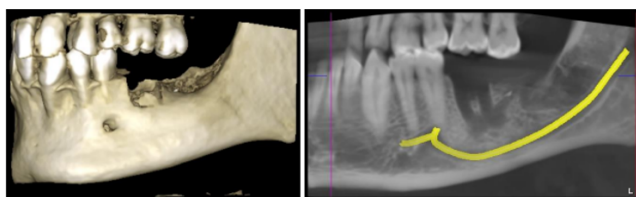
A 49 yrs old systemically healthy male patient reported to our clinic with the chief complaint of missing lower left back teeth. These were lost due to mobility and vertical fracture 2yrs before. The patient showed signs of bruxism like generalized attrition, dentinal hypersensitivity, wear facets and TMJ clicking. The ridge resorption was both horizontal and vertical falling into Siebert's Class III.<sup>1</sup> Routine haematological examination was carried out and all the values were found to be within normal range. A full mouth Cone Beam Computed Tomography was taken and it revealed that bone loss was "Crater-like" bordering the inferior alveolar canal. There was both vertical and horizontal bone loss but the former was more severe being only about 4mm in the 37 region precluding implant placement.(Figure 1)

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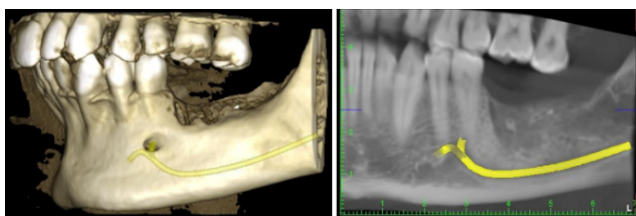
E-mail address: [rashparams2005@yahoo.co.in](mailto:rashparams2005@yahoo.co.in) (R. Paramashivaiah).

### 2.1. Ridge augmentation procedure

Local anaesthetic 0.2% Lignocaine hydrochloride 1:80,000 Adrenaline was administered and a crestal incision was placed in relation to 36,37 and extended to 38 for better accessibility. After reflection with a Molt's periosteal elevator freeze-dried bone allograft was mixed with some fresh blood and adapted to the ridge area. A resorbable collagen Heliguide matrix\* was soaked in saline for 30 minutes after being trimmed to fit the ridge defect over the graft. The flap margins were sutured using 3-0 black silk, interrupted figure of eight sutures. The sutures were removed after one week. The patient was recalled after four months and CBCT was repeated and it showed a good bone fill.(Figures 1 and 2)



**Figure 1:** Ridge defect baseline

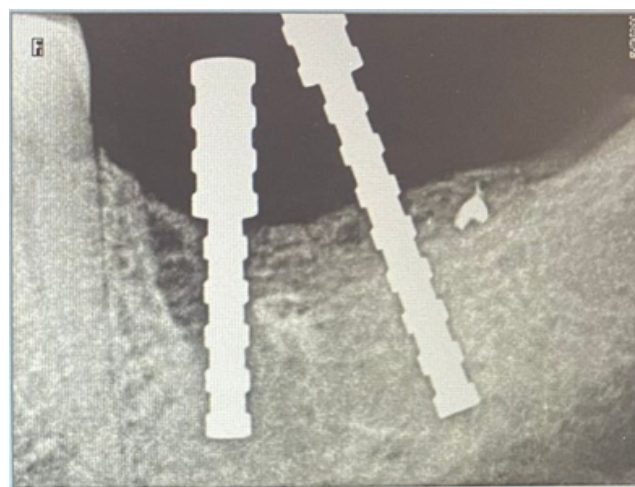


**Figure 2:** Ridge defect with bone fill after four months

### 2.2. Implant placement

After checking out the CBCT in the six months follow up it was found that there was adequate bone fill. As a precaution it was decided to wait for another month before implant placement. Basic hematological investigations were repeated. An inferior alveolar nerve block was administered using 2% Lignocaine Hydrochloride with 1:80,000 adrenaline. A crestal incision was placed with a No.15 blade and vertical incision added mesially for better reflection and accessibility. Upon reflection it was found that the bone formation was satisfactory. Sequential drilling was carried out and two cylindrical, screw implants were placed in the region of 36 and 37 leaving an adequate gap mesiodistally and buccolingually (Figures 3 and 4).

There was a good primary stability of around 70 N cm for 36 and 80 N cm for 37. After placing the cover screw the flap was approximated with interrupted sutures (Black silk 3-0). Routine post-operative instructions and medications were prescribed (Amoxicillin 500 mg t.i.d for 5 days, Ketorol DT



**Figure 3:** Placement of paralleling pins



**Figure 4:** Implants in final position

10 mg b.i.d for 3 days and Chlorhexidine Glauconate 0.2% b.i.d for one week). The sutures were removed after one week.

### 2.3. Second stage implant surgery

It was decided to delay the Stage-2 surgery as the implant placement was carried out at the grafted site. The patient was recalled after five months and the implant heads were exposed with a punch incision followed by placement of two healing collars (3mm thick i.r.t 36 and 5mm thick i.r.t 37). After two weeks impressions were obtained using open tray method. The final prosthesis of porcelain fused to metal crown was delivered after jig and metal trial. Patient was given instructions on oral hygiene maintenance including the use of Water Pik. Supportive periodontal therapy included a 3-months recall for the first year followed by six months recall later.

### 3. Discussion

Restoration of function is the ultimate goal in terms of the patient. After the loss of teeth the restorative treatment options depends on the location of edentulous space, it's bone morphology and microstructure, tissue biotype, status of adjacent and opposing teeth and the type of occlusion. Bone grafts used to restore alveolar ridge are autogenous, allogenic, xenogenic and synthetic. Allografts are derived from cadavers and are of two types demineralized freeze-dried bone allograft (DFDBA) and mineralized freeze-dried bone allograft (FDBA). Each of them have their own advantages and disadvantages. According to few studies DFDBA has limited osteogenic potential whereas few others claim that it can induce new bone.<sup>2–4</sup> A clinical trial by Wood et al compared DFDBA with FDBA for socket preservation histologically and it was found that there was greater vital bone formation in DFDBA group and faster resorption than FDBA.<sup>5</sup> This has been hypothesized to be dependent upon donor site identity and production variables of the graft material. The main advantage of FDBA is the prolonged osteoclastic resorption and thereby prolongation of osteoinductive protein release. Although FDBA has same Bone Morphogenic Proteins as DFDBA it lacks it's osteoinductivity. In an study by Lev et al the Bone-implant-contact (BIC) and bone-area fraction (BAF) were compared histomorphically between implants adjacent to FDBA blocks versus particulate FDBA in rabbit calvaria. The mean BIC was 34.4% in FDBA block group and 33.5% in the particulate FDBA group. The mean BAF was 23.9% and 26.4% for block and particulate group respectively.<sup>6</sup> After extraction of teeth resorption is the predominant feature of healing.<sup>7</sup> There is higher percentage of resorption in the horizontal direction and more so on the facial aspect.<sup>8</sup> Even the loss of vertical height is more on buccal side.<sup>9</sup> When there is a loss of ridge width and height a combination of membrane and graft has a better success. In a study by Lasella et al ridge preservation with tetracycline hydrated freeze-dried bone allograft with collagen membrane was assessed over no preservation prior to implant placement. The graft used here had a particle size of 500 to 1,000  $\mu\text{m}$  similar to the present case report.<sup>10</sup>

### 4. Conclusion

This is a case report about a patient with edentulous resorbed ridge in the third quadrant. The implant site was developed with the combination of mineralized freeze dried bone allograft and resorbable collagen membrane. The implants were placed with two stage protocol and showed good osseointegration both clinically and radiographically. Thus regeneration of alveolar ridge with a combination of allograft and membrane is a feasible treatment option for

successful implant placement.

### 5. Source of Funding

None.


### 6. Conflict of Interest

None.

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