

Management of a Failing Implant by Guided Bone Regeneration: A Case Report

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Abstract

Introduction:

Implants can fail due to several causes, they can be failure to osseointegrate, defective prosthesis, fracture of the implant body, malposition implants that can damage vital structures, and peri-implant advanced loss of bone. Management of peri-implant complication is an important aspect in implant dentistry.

Aim:

The following case report demonstrates management of an early implant failure of an immediate implant using guided bone regeneration (GBR).

Methodology:

A 30 years old male patient underwent immediate implant placement w.r.t 11. After two weeks, he reported to the clinic with pain and suppuration. Then CBCT was advised, which revealed complete buccal bone resorption and compromised primary stability. The patient was treated surgically after an extensive study of the CBCT report. The implant was retrieved and re-implanted, placing the implant more palatally followed by GBR to treat the advanced bone loss. Thus, assisting in osseointegration.

Result:

Proper osseointegration was attained at 6 months follow-up followed by loading of the prosthesis.

Conclusion:

Guided bone regeneration is a pioneering method for the management of such implant complications.

Keywords: Implant Management, Early Implant Failure, Failing Implant, Guided Bone Regeneration

INTRODUCTION

Implants can fail due to multiple reasons, some being osseointegration failure, defective prosthesis, implant fracture, damage to vital structures due to implant malposition, or advanced loss of bone around an implant. Clinicians classify implant failure into two broad categories: early failure and late failure. Early implant failure occurs before osseointegration, thus indicating failure of primary stability. Late implant failure occurs implant integration, sometime after loading, thus indicating failure of secondary stability (osseointegration).

As per the classification given by Askary et al.⁽¹⁾

- 1. Ailing implant:** An Implant showing only soft tissue inflammation are classified as ailing implants and have a good prognosis when treated.
- 2. Failing implant:** An implant that is unremittingly losing its bone anchorage, although still stable.
- 3. Failed implant:** A mobile Implants

which exhibits bone loss greater than 70%.

An ailing implant can lead to a failing implant which in turn can lead to failed implant if not treated at the right time.

According to Esposito M et al (1998)⁽²⁾ and Alssadi et al (2007)⁽³⁾:

1. Early failure occurs before or at the abutment connection. The suggested explanation is a failure to establish osseointegration due to interference with the healing process.
2. Late failure is when occlusal load is the factor. The proposed explanation being failure to maintain the established osseointegration due to a process involving its breakdown

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Guided Bone Regeneration ^{(6) (7)}

- Dahlin et al. 1988) introduced GBR as a therapeutic modality for bone regeneration using barrier membranes.
- The GBR treatment concept was developed based on the GTR principle (Dahlin et al. 1988; Hammerle et al. 1995).
- GBR-mediated osseous regeneration is dependent on the migration of pluripotent and osteogenic cells. (e.g. osteoblasts derived from the periosteum and/or adjacent bone and/or bone marrow) to the bone defect site and exclusion of cells impeding bone formation (e.g. epithelial cells and fibroblasts).

CASE REPORT

A 30 years old male patient underwent immediate implant placement w.r.t 11. He reported to the department with pain and suppuration through the sutures.

The patient had no underlying medical or habit history. The immediate implant was placed following the extraction of 11. Upon taking history, the patient revealed that he had a childhood trauma of the tooth, which discolored with time. Upon a visit to a dental clinic where he was advised to get it extracted followed by a prosthetic replacement.

Upon examination, as sutures were removed, bleeding and swelling were noted (Figure 01). The patient was explained about complications and advised of a CBCT investigation.

Upon CBCT investigation, complete buccal bone resorption and compromised primary stability was noted (Figure 02).

Surgical intervention was planned after extensively studying the CBCT report. Since the implant was placed just 2 weeks back, it was planned to retrieve, debride, reorient and place it.

(Figure 03) shows the implant on surgically opening the site. (Figure 04) and (Figure 05) shows after retrieval and reorientation of the implant respectively.

Followed by a guided bone regeneration using BioOss bone substitute (bovine Xenograft) and BioGuide collagen membrane to successfully perform Guided bone regeneration. (Figure 06) and (Figure 07) respectively show the placement of bone graft followed by GTR collagen membrane in the buccal defect site.

Sutures were placed at the surgical site (Figure 08) and they were removed after 2 weeks. The implant was left for 6 months to osseointegrate successfully.

Post-op CBCT after 6 months revealed buccal cortical bone formation and the successfully placed implant (Figure 09). The prosthesis was given at the 6-month interval and another CBCT investigation was performed 12 months post-surgery which shows a successfully osseointegrated implant (Figure 10).

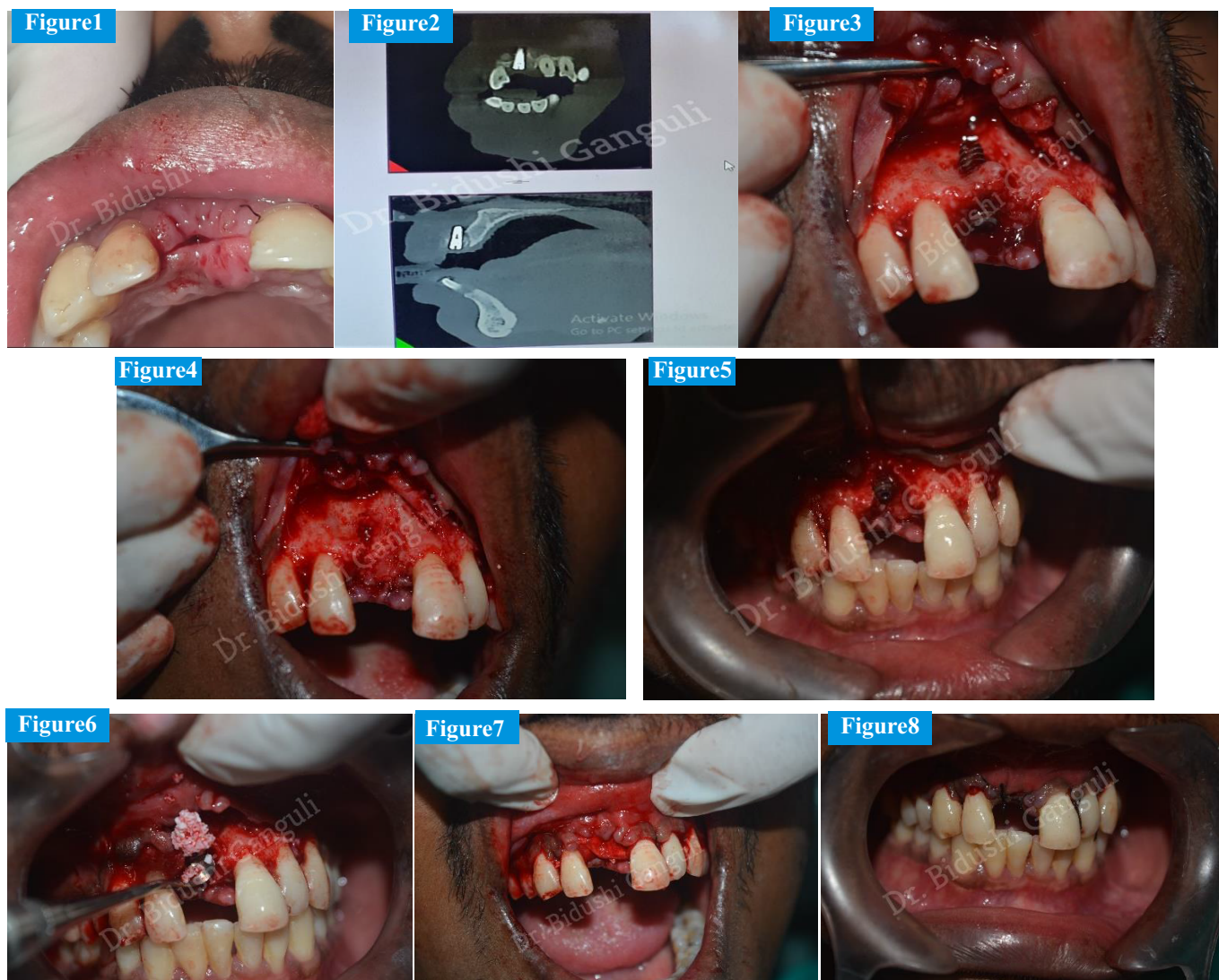


Figure 9

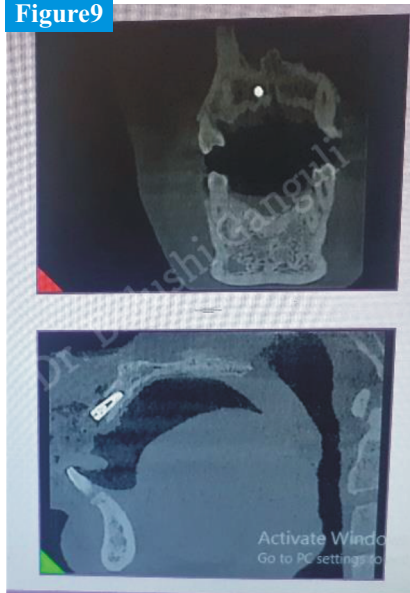
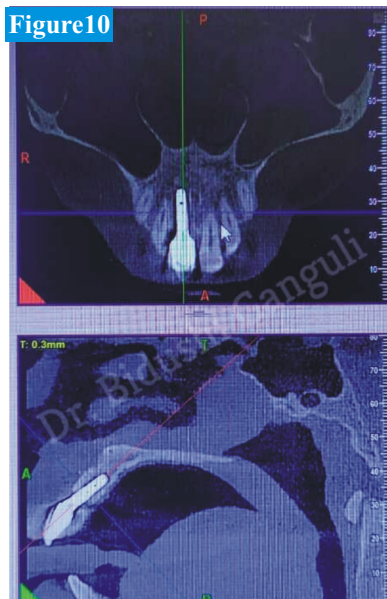


Figure 10



DISCUSSION

The treatment concept i.e Guided Bone Regeneration (GBR) advocates that osseous defect regeneration is observable through the use of occlusive membranes that mechanically exempt non-osteogenic cell populations from the vicinity soft tissues, enabling osteogenic cell populations out from parent bone to inhabit the osseous wound.

This concept being widely used in periodontal regeneration, is now widely used in implant dentistry for peri-implant bone regeneration

GBR in implantology has been used and documented in numerous treatment aspects

1. Alveolar Ridge Augmentation⁽⁸⁾⁽¹²⁾
2. Socket Preservation⁽⁹⁾⁽¹⁰⁾
3. Bone Defect⁽¹¹⁾⁽¹³⁾
4. During Immediate implant placement⁽¹⁰⁾

As per this case report, the concept of GBR is used in clinical practice related to implantology.

CONCLUSION

This article reports a case where the concept of GBR was used to manage a failing implant, thus broadening the use of GBR in implantology.

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