

## Ridge splitting technique followed by implant placement for atrophic ridges wrt 35- A Case Report

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### Abstract

**Background:** A two stage approach of ridge splitting and lateral expansion in the mandible to achieve enough bone width for the purpose of dental implant placement. **Methods:** 32 yr old male patient reported to the department with the chief complaint of missing tooth. On examination ridge was atrophic for implant placement. So, ridge split was planned with implant placement. **Results:** Approximately, 85-90% of the expanded area were successful in providing an adequate width to accommodate an implant. Implant was inserted. Prosthetic loading was successfully implanted wrt to 35. **Conclusion:** Ridge split technique is a short and simple procedure with satisfactory results and minimum morbidity. It has low rate cost, therefore, should be employed more often.

Keywords: Ridge split, Atrophic ridge, Dental implant, Bone augmentation

### INTRODUCTION

A major limitation for successful implant placement remains the problem of inadequate alveolar ridge width. To achieve the ideal goal of an implant placement, the hard and soft tissues need to present in ideal volume and quality. The labial alveolar bone often undergoes rapid reconstruction after tooth loss with approximately 25% decrease in volume during 1<sup>st</sup> year, followed by 60% loss in next 3

years.<sup>1</sup> Thus due to this sequel of resorption jeopardizes the functional and esthetic outcome of the treatment. Therefore, augmentation of atrophic ridge is an important aspect for implant placement. The ridge deficiencies can be vertical, horizontal and combination of both. The technique of ridge split was introduced in early 1970s.<sup>2</sup> This technique has an added advantage of augmentation and implant placement in a single sitting. Ridge splitting technique is useful in managing narrow edentulous ridge >3.5mm for implant

placement.<sup>3</sup> In this case we described a case of horizontal ridge split and simultaneous implant placement in mandibular premolar area.

### CASE REPORT

A 32 year old male patient reported to the department of periodontics, Buddha institute of dental sciences and hospital with chief complaint of missing tooth. (Fig-1)



Fig-1- Missing tooth wrt 35

He had no medical history, patient was undergoing orthodontic treatment for malocclusion.

#### Clinical examination:

Intraoral examination:

1. Attrition was present
2. atrophic ridge was present wrt missing tooth with width of 2 mm.
3. grade 1 calculus deposits were present
4. malocclusion present

In 1<sup>st</sup> visit of patient we discussed all the treatment plan with the patient. Phase 1 therapy was done followed by

oral hygiene instruction. Patient was asked to get some blood investigation done followed by IOPA x- ray wrt 35. Patient was asked to reported to the department after 15 days for implant placement followed by ridge splitting technique.

#### Procedure:

On the day of surgery ridge split was done wrt 35 with piezoelectric device and then osteotomy site was prepared, and equinox implant of size 10mm length and 4 mm width was placed with hydroxyapatite bone graft filled wrt osteotomy site.(Fig- 2 & 3)



Fig-2- Ridge split done

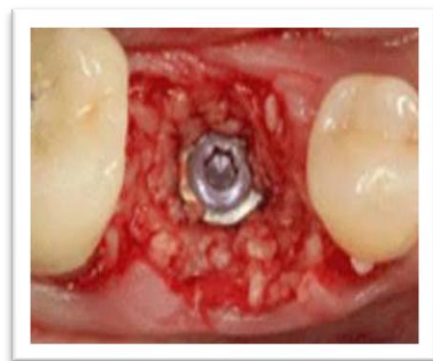


Fig -3- Implant placed

At last suture was given. IOPA was taken to see the implant placement. (Fig-4)



Fig-4- IOPA of implant

## RESULTS

After 15 days patient had no sign of inflammation and implant was stable. Oral hygiene of the patient was good. Again, patient recalled after 15 days, 3 months and 4 months. After 4 months implant was rechecked for secondary stability, stability was achieved. Patient impression was taken and send for prosthesis. After 15 days prosthesis was given to the patient. (Fig- 5)



Fig-5- After prosthesis

## DISCUSSION

Alveolar ridge split is a technique for bone expansion used in the treatment of atrophic ridges with horizontal deficit. This technique carried out with implant placement simultaneously. Previously it used to carry out with mallet and chisels, rotary burs,

diamond disk, but now a days piezoelectric unit is used<sup>4</sup>. It has advantage that it takes lesser time, low cost, precise cutting, so it cause minimal tissue damage leading to good wound healing and single visit splitting with implant placement can be done easily.<sup>5</sup> Jensen et al indirectly demonstrate the rare usage of ridge splitting technique in the lower jaw compared to the upper, mainly due to rigidity of the mandibular cortical bone.<sup>6</sup>

In the present study, in order to visibility to the buccal cortical bone, a full thickness flap was elevated, giving the possibility for complete corticotomy. During the following 3-4 weeks of bone recovery, new angiogenesis is expected throughout the cortical plate, decreasing the possibility of complications when lateralizing it.<sup>7,8</sup> The final implant is threaded into position using a slow speed, high torque physio-dispenser hand piece. Bone graft can be placed in the space of bone and implant and at the crestal region with membrane to prevent risk of crestal bone loss which also aid in bone remodeling.

## CONCLUSION

There are many methods for augmentation of implant in atrophic ridge. Ridge split is advocated in many cases now a days. The most important factor for successful ridge splitting is patient selection and bone evaluation.<sup>9</sup> Although, this surgical approach is suitable for both the jaws, it is better suited for maxilla.<sup>10</sup> Thus, to satisfy the ideal goals of implant dentistry



augmentation of deficient alveolar ridges is an important aspect of dental implant therapy with the end goal to provide functional restoration that is in harmony with the adjacent natural dentition as in this case report.

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### **REFERENCES**

1. Tair JAA. Modification of mandibular ridge splitting technique for horizontal augmentation of atrophic ridges. *Ann Maxillofac Sur.* 2014;4:19-23.
2. Buser D, Bragger U, Lang NP, Nyman S. Regeneration and enlargement of jaw bone using guided tissue regeneration. *Clin Oral Implants Res.* 1995;10:67-73.
3. Machery R, Thiruvalluvan N, Sreehari AK. Ridge split and implant placement in deficient alveolar ridge: case report and an update. *ContempClin Dent.* 2015;6:94-97.
4. Sethi A, Kaus T. maxillary ridge exoansion with simultaneous implant placement: 5 year results of an ongoing clinical study. *Int J Oral Maxillofac Implants.* 2000;15:491-499.
5. Krishnamoorthy G, Prabhu N, Goyal V, Srikanth. Horizontal ridge augmentation using ridge expansion technique followed by implant placement. *Indian Journal of public health research and development.* 2019;10.
6. Olate S, Marn C, Oporto G, Farias D, Cant M. Alveolar ridge splitting for implant installation in atrophic sites. *Int J Odontostomat.* 2015;9:294-254.
7. Moro A, Gasparini G, Foresta E, Saponaro G, Falchi M, Cardarelli L et al. Alveolar ridge split technique using piezosurgery with specially designed tips. *Clinical study.* 2017; doi-10/1155/2017/4530378.
8. Tallgren A. The continuing reduction of the residual alveolar ridge in complete denture wearers: a mixed longitudinal study covering 25 years. *Journal of prosthetic dentistry.* 2003;89.
9. Holtzclaw DJ, Toscano NJ, Rosen PS. Reconstruction of posterior mandibular alveolar ridge deficiencies with the piezoelectric hinge- assisted ridge split technique: A Retrospective Observational Report. *J Periodontol.* 2010;81:1580-1586.
10. Gadalla H, Kinaia B. split ridge technique for dental implant placement in the esthetic zone: A Case Report. *EC Dental Science* 2019:174-183.

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