ORIGINAL RESEARCH PAPER

Volume-8 | Issue-6 | June-2019 | PRINT ISSN No. 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

USE OF ALVEOLAR DISTRACTION FOR REHABILITATION IN A TRAUMATIC DEFECT OF ALVEOLUS - A CASE REPORT

Dental Science

Dr. Kratika Soni MDS (Oral & Maillofacial Surgery), Junior Resident –II, Department Of Oral And Maxillofacial Surgery, I.T.S-Centre for Dental Studies and Research, Ghaziabad

Dr. Pradeep Sharma* MDS (Oral & Maxillofacial Surgery) Senior Lecturer Department Of Oral And Maxillofacial Surgery I.T.S-Centre for Dental Studies and Research, Ghaziabad *Corresponding Author

Dr.Vidhi C. Rathi MDS (Oral & Maxillofacial Surgery) Reader Department Of Oral And Maxillofacial Surgery I.T.S-Centre for Dental Studies and Research, Ghaziabad

Dr. Amit Gupta MDS (Oral & Maxillofacial Surgery) Reader Department Of Oral And Maxillofacial Surgery I.T.S-Centre for Dental Studies and Research, Ghaziabad

Dr. Sanjeev Kumar MDS (Oral & Maxillofacial Surgery) Professor & Head Of The Department Department of Oral and Maxillofacial Surgery I.T.S-Centre for Dental Studies and Research, Ghaziabad

ABSTRACT

Distraction osteogenesis is becoming the treatment of choice for the surgical correction of the craniofacial defects. Its principle is based on the studies of Ilizarov, who showed that osteogenesis can be induced if bone is expanded (distracted) along its long axis at the rate of 1 mm per day. This process induces new bone formation along the vector of pull without requiring the use of a bone graft. The technique also provides the added benefit of expanding the overlying soft tissues, which are frequently deficient in these patients. The case report highlights the procedure of vertical alveolar distraction osteogenesis in post traumatic defect of an 18year old male with rehabilitation with implant placement by the knowledge of clinical and research experience. It is a promising option to aid uneventful prosthodontic rehabilitation of severe vertically resorbed alveolar ridges and also in case of single unit missing teeth and emphasizes the critical role that basic science research has played in its evolution.

KEYWORDS

alveolar distraction osteogenesis, bone graft,dental implants, guided bone regeneration,autogenous bone graft

INTRODUCTION

Traumatic injuries usually cause a massive soft and hard tissue damage and anatomic deficiency which not only causes the loss of attached mucosa, gingiva, teeth but also drastically decreases the bone height which causes difficulty in post traumatic rehabilitation and requires additional surgical procedures such as bone grafting, free flaps[1],guided bone regeneration[2],autogenous bone graft[3],vertical distraction osteogenesis[4].

The augmentation of the deficient bone especially mandible is very challenging due to presence of teeth and inferior alveolar nerve in the posterior segment[5].

The rehabilitation of the post traumatic defect with the help of distraction osteogenesis have gained a popularity in the past two decades[6]

CASE REPORT

An 18 year old male patient with the history of operated right parasymphysis fracture due to an RTA 6 months back, reported to our department for the rehabilitation of missing lower front teeth.

On clinical examination reduced anterior alveolar ridge height with missing lower anterior teeth 31 32 33 41 42 43 44 45 and 16 (Figure 1). Occlusion was stable, and normal mouth opening can be seen.

The orthopantomogram of the patient revealed the presence of a miniplate 6-hole with gap and a lag screw placed at the right parasymphysis fractured site. A complete reduction of the fractured segment could be seen.

TREATMENT PROGRESS

The patient was diagnosed with post traumatic alveolar defect for which he was planned for vertical distraction osteogenesis under general anesthesia and further rehabilitation of the patient with dental implants.

The patient was painted and draped under aseptic condition. A crestal incision was given in lower anterior region to expose the previously reduced fractured segment and removal of all the hardware was performed including a miniplate and lag screws

The adaptation of the alveolar distractor was done and ostectomy cuts were marked with the piezoelectric. Then osteotomy was done with an ossilating saw and ostectomy was done with the mallet and osteotome and then final fixation of the alveolar distractor was done and the device was activated (Figure 2).

An unobstructed opening of the device was confirmed and primary closure was done with 3-0 vicryl suture

The distraction protocol followed was the latency period of 5 days. The distraction was started at a rate of 1mm/day (0.5mm*2/day) was continued for 7 days.

It was followed by the consolidation period of 6 weeks after the desired bone height was achieved.

With the regular follow ups and sequential radiographs we can appreciate the new bone formation at the distracted site. As a result a gross increase of 7mm in bone height was achieved (Figure 3).

Surgical removal of the distractor was done followed by the placement of 5 implants in lower anteriors.

After 5 months of osseointegration abutments were placed and the impression was taken which was followed by the metal coping and porcelain fused metal crown.

DISCUSSION

The reconstruction of maxillary defects requires soft tissue to close any fistula and additional bone augmentation of the alveolar crest for subsequent functional oral and maxillofacial rehabilitation, such as dental implants[1].

Even the mandibular defect requires hard tissue augmentation.

Conventional grafting technique creates donor site morbidity with harvesting of soft tissue and bone grafts. The technique that we have presented here provides local soft tissue and hard tissue reconstruction without any secondary wound site.

This technique also provides better adaptation of the prosthesis post operatively.

The presence of native keratinized attached gingiva in the reconstructed defect by use of a regenerative tissue distraction technique might be very important for maintaining future oral hygiene, thus preventing implantitis, which is not easily achieved with traditional reconstruction methods.[7,8,9]

CONCLUSION

Distraction osteogenesis proved to be a good alternative for traumatic alveolar ridge augmentation by increasing the bone volume and soft tissue lengthening and also improved the site for placement of osseointegrated implants.

Conflicts of Interest: None

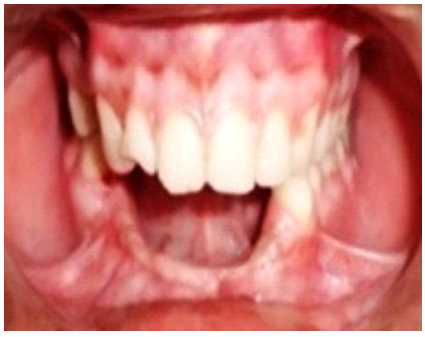

FIGURE-1 Intraoral Pre-Operative Traumatic Defect and

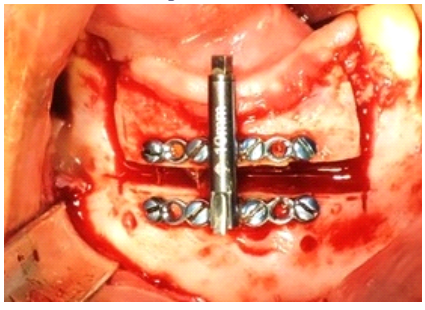

FIGURE-2 Distractor Placement Intraoperatively

FIGURE-3 Post operative increase in bone height

REFERENCES

1. Tuna EB1, Ozgen M, Cankaya AB, Sen C, Gencay K. Oral Rehabilitation in a Patient with Major Maxillofacial Trauma: A Case Management. Case Rep Dent. 2012;2012:267143
2. Cucchi A,Ghensi P.Vertical guided bone regeneration using titanium-reinforced d-PTFE membrane and prehydrated corticocanceous bone graft.Open Dent J2014;8:194-200
3. De Moraes PH, Olate S,Lauria A,Asprino L, de Moraes M, de Albergaria-Barbosa JR.8-10 year follow up survival of dental implants in maxillae with or without autogenous bone graft reconstruction.Int J Clin Exp Med 2015;8:19282-19289.
4. Cheung LK, Chua HD, Hariri F, Pow EH,Zheng LW. Alveolar distraction osteogenesis for dental implant rehabilitation following fibular reconstruction:A case series.J Oral Maxillofac Surg 2013;71:255-271.
5. Rachmiel A, Shilo D,Aizenbud D. Vertical Alveolar Distraction Osteogenesis of the Atrophic Posterior Mandible Prior to Dental Implant Insertion . Journal of Oral and Maxillofacial Surgery.Volume 75, Issue 6,2017, Pages 1164-1175
6. A. Rachmiel, O. Emodi, D. Aizenbud, D. Rachmiel, D. Shilo: Two-stage reconstruction of the severely deficient alveolar ridge: bone graft followed by alveolar distraction osteogenesis. Int. J. Oral Maxillofac. Surg. 2018; 47: 117–124. ã 2017
7. Cheung LK, Zhang Q: Healing of maxillary alveolus in transport distraction osteogenesis for partial maxillectomy. J Oral Maxillofac Surg 62:66, 2004
8. Kanno T, Mitsugi M, Sukegawa S, et al: Computer-simulated bi-directional alveolar distraction osteogenesis. Clin Oral Implants Res 19:1211, 200.
9. Mitsugi M, Ito O, Alcalde RE: Maxillary bone transportation in alveolar cleft-transport distraction osteogenesis for treatment of alveolar cleft repair. Br J Plast Surg 58:619, 2005