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Esthetic Management of Midline Diastema by Combined Surgical and Prosthetic Approach

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Maxillary midline diastemas are a common esthetic problem that dentists must treat. Many innovative therapies have been used, varying from restorative procedures to surgery (frenectomies) and orthodontics. The need for treatment is mainly attributed to esthetic and psychological reasons, rather than functional ones. Present case report is about 34 year old female patient whose midline diastema was managed by surgical and prosthetic approach.

KEYWORDS: Midline diastema, Frenectomy, Porcelain crown, Esthetics

INTRODUCTION

Maxillary midline diastema (MMD) is a common esthetic complaint of patients. MMD can be defined as a space greater than 0.5 mm between the proximal surfaces of the two central incisors.¹ The space can be a normal growth characteristic during the primary and mixed dentition and generally is closed by the time the maxillary canines erupt. For some individuals, however, the diastema does not close spontaneously. It can be one of the most negative factors in self perceived dental appearance. Treatment is mainly for esthetic and psychological reasons, rather than functional ones.² Esthetic treatment of diastema closure presents a challenge in clinical practice. Maxilla had a higher prevalence of midline diastema than the mandible.³ Angle concluded the presence of abnormal frenum as the cause for midline diastema and this view was supported by other researches.⁴⁻⁷ Weber listed the causes for spacing between the maxillary incisors as: A result of high frenum attachment; microdontia; macrognathia; supernumerary teeth; peg laterals; missing lateral incisors; midline cysts and habits such as thumb sucking, mouth-breathing and tongue-thrusting.⁸ Midline diastema is physiological and usually occurs if the canines have not been erupted. Different treatment modalities for midline diastema include removal of etiology and simple removable appliances incorporating finger springs or split labial bow.

Gleghorn reported a direct composite restoration technique to correct unaesthetic diastema.⁹ Present case report is about 34 year old female patient whose midline diastema was managed by surgical and prosthetic approach.

CASE REPORT

A 34 year old female patient reported to department of Prosthodontics, PGIDS Rohtak with chief complaint of spacing in between maxillary central incisors and wanted to get it treated with in short period of time due to esthetic problem. Patient was properly examined. Patient's medical history did not reveal any systemic diseases. Intra-oral periodical radiograph was taken to find out the cause of diastema and to rule out the presence of any unerupted mesiodens and diagnosed with high labial frenum attachment, approximately 3 mm spacing in between maxillary central incisors (Figure 1). Overjet and overbite were within normal limits. Oral hygiene was satisfactory. Due to esthetic and financial issues along with short period of time, it was decided to manage diastema with surgical procedure (frenectomy) followed by porcelain crown fabrication.

FRENECTOMY

After completion of phase 1 therapy (scaling and

root planning), frenectomy for high labial frenum attachment was done after getting informed consent.

PROCEDURE

Frenectomy was carried out under local anesthesia with incision using No. 11 Bard Parker blade (Figure 2). In this technique, lateral incisions were made on either side of the frenum to the depth of the underlying bone. The free marginal tissues on the mesial side of the central incisors were not disturbed. The wedge of tissue was picked up with tissue forceps and excised with tissue shears at the area close enough to the origin of the frenum to provide a desirable cosmetic effect. Sutures were placed to identify the free tissue margins on either side of the removed tissue and periodontal pack was placed for a week (Figure 3). Patient was recalled after a week for suture removal.

CROWN FABRICATION

After 2 weeks of suture removal, diagnostic impressions were made using irreversible hydrocolloid (Algitex, DPI, India), poured with Type IV dental stone and stone casts retrieved for a comprehensive treatment planning. One set of study models was used for wax up of the central incisors alone. On the second set of study cast, mock preparations were done in relation to 11 & 21. Smile design was carried out, explained to the patient, after getting informed consent and satisfaction of patient, the treatment protocols were started (Figure 4). At the onset of the treatment, thorough scaling and polishing was done. Before proceeding for tooth preparation, shade was selected using Vitapan Classical shade guide (Vita Zahnfabrik, Germany). Patient was delivered with porcelain crown as fixed dental prosthesis. There was considerable improvement in overall appearance of the patients in terms of esthetics (Figure 5).

DISCUSSION

Midline diastema could be transient or created by developmental, pathological, or iatrogenic factors such as mesiodens, microdontia, hypodontia, abnormal oral habits, enlarge frenum, etc. Because of the potential for multiple etiologies, the diagnosis of a diastema must be based on a thorough medical/dental history, clinical examination, and radiographic survey. Different treatment modalities include removable

orthodontic appliances, full arch, single arch or sectional fixed orthodontic appliances, excision of the frenum, restoration techniques, extraction of mesiodens, habit breaking appliances, etc. Diastema based on tooth-size discrepancy is most amenable to restorative and prosthodontic solutions. Even though orthodontic treatment is a viable option, most adults do not want to spend several years and multiple appointments to enhance their smiles. The restorative closure of diastema can be achieved by using any of the techniques mentioned; direct composite veneers, indirect composite veneers, porcelain laminate veneers, all ceramic crowns, metal ceramic crowns and composite crowns. Aesthetic rehabilitation in complex diastema closure cases is guided by the principles of proportion. The width to length ratio of the centrals must be pleasing. Achievement of this proper balance dictates treatment.¹⁰ It determines the amount of distal proximal reduction; the decision to completely crown the incisors vs. just adding to the interproximal; the number of teeth to be treated; the placement and location of naturally occurring prominences and concavities to create the illusion of a narrower tooth. The proper accommodation of these four topics will permit the maintenance or restoration of acceptable dimensions in the centrals.¹⁰ Modern dentistry has seen the development of many new materials and techniques. Two major developments in recent times are dentine bonding and stronger all-ceramic crown systems. All-ceramic systems have expanded the range of restorative treatment options significantly; at the same time, their handling has been simplified substantially.

CONCLUSION

The results achieved in this case fulfill initial treatment objectives and may be considered a success. From an esthetic perspective, patient was completely satisfied.

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Source of support: Nil, **Conflict of interest:** None declared

Cite this article as:

Singh P, Sheoran K, Attresh G, Yadav P. Esthetic Management of Midline Diastema by Combined Surgical and Prosthetic Approach. *Int Healthcare Res J* 2017;1(4):20-3.

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LEGENDS



Figure 1. Pre-operative photograph.



Figure 2. Frenectomy under local anesthesia with incision using No. 11 Bard Parke blade.



Figure 3. Placement of sutures and periodontal pack



Figure 4. Tooth preparation for crown placement



Figure 5. Placement of crown and considerable improvement in overall esthetics is seen.