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CASE STUDY

CONSERVATIVE AND ORTHODONTIC MANAGEMENT OF MAXILLARY MIDLINE DIASTEMA

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ABSTRACT

Background: Maxillary midline diastema (MMD) is a common problem patient report to a dental clinic. It has both aesthetic and psychological role on patient's personality. Various treatment options are available for treatment of MMD. Correct cause should be diagnosed and proper treatment should be rendered accordingly.
Case discussion: The present article reports the case of a maxillary midline diastema closure in a healthy dentition by an interdisciplinary approach. Orthodontic space redistribution of the midline diastema was done followed by restoration with ceramic laminates.
Conclusion: A combined orthodontic and prosthetic interdisciplinary approach resulted in excellent outcome in this case.

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INTRODUCTION

A maxillary midline diastema (MMD) often is a primary concern of patients during a dental consultation. An MMD can adversely affect body image and self-esteem, and it can be one of the most negative factors in self-perceived dental appearance. Keene defined MMD as a space greater than 0.5 mm between the proximal surfaces of the two central incisors because such a gap is noticeable (Chu *et al*., 2011). A MMD of greater than 2 millimeters in the mixed dentition is unlikely to close spontaneously and may persist in the permanent dentition (Chu *et al*., 2011). Management of MMDs in the permanent dentition requires a detailed examination and appropriate care. Before formulating a definitive treatment plan for a patient with an MMD, the clinician needs to know the cause of the condition. It can be due to anomaly in the number of teeth (such as mesiodens or hypo - dontia) or the size of teeth (such as microdontia), high frenum attachment, abnormal oral habits or periodontal problem. Clinicians must obtain a comprehensive medical history, including the duration of the diastema, any changes in size and any previous orthodontic treatment, as well as a comprehensive family history. It can be related to ethnicity. Its prevalence ranges from 1.6 to 25.4 percent of adults in various populations and age groups (Chu *et al*., 2011).

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Case report

A 45 year old female patient reported to our department with a chief complaint of spacing in upper front teeth and unaesthetic smile (Fig.1). On clinical examination maxillary midline diastema was seen with relatively smaller sized maxillary right and left lateral incisors (Fig.2). On taking history it was found that she was not confident during smiling and was having psychological problems in communication. She had no other problems regarding tooth alignment, function or esthetics. Till now she did not get it treated due to economical problems. On proper intraoral examination Angle's Class I malocclusion was seen. The cause of MMD was diagnosed to be due to tooth and arch size discrepancy. Other possible causes of MMD such as high frenum attachment, unerupted mesiodens etc. were excluded clinically and radiographically. Maxillary midline diastema was of 3 mm. MMD greater than 2 mm are unlikely to resolve without intervention. The possible treatment options for maxillary midline diastema were direct composite

restorations, porcelain veneers, orthodontic treatment and full coverage restorations. In this case considering the clinical situation and the patient's need, an interdisciplinary approach was needed. The treatment plan decided was to redistribute the space by segmental loop mechanics and then treating the diastema by porcelain veneers. This treatment plan was explained to the patient and she got ready for the same.

Fig.1. Pretreatment Photograph

Fig.2. Intra oral pre operative clinical image

Fig.3. Orthodontic phase

Fig.4. Tooth preparation for laminates

Fig.5. Intra oral post-operative clinical image

Fig. 6. Post treatment Extra oral clinical image

Oral prophylaxis was carried out and diagnostic impression was taken with irreversible hydrocolloid. Diagnostic cast was made and wax up was done and shown to the patient. Patient was treated with 0.022 x 0.028- inch preadjusted edgewise appliance bracket systems which were bonded to maxillary central incisors. A closed loop of 0.017 x 0.025 inch TMA (titanium molybdenum aluminium) wire was fabricated. The closed TMA wire loop was ligated in between central incisors to apply force of 100mg (Fig. 3). Activation of appliance system was done after one month of insertion. 2mm of MMD was closed with fixed orthodontic appliance in two months leaving 1.0 mm of space between the two central incisors. Also 1.0 mm of space was opened on both the sides between central and lateral incisors. This space was utilized to increase the width of lateral incisors according to the Golden Proportion. Shade selection was done before tooth preparation. The labial surfaces were reduced by 0.5 mm for adequate thickness of porcelain and to create illusion of depth, translucency and characterization. Cervically a light chamfer finish line was created. An incisal wrap preparation was contemplated. Incisal edge was reduced by about 1mm. During the preparation, care was taken so that dentin was not exposed. All sharp line angles were rounded and the path of insertion of the veneers was made free from undercuts (Fig.4). The occlusal clearance in excursions was evaluated. Following the tooth preparation, a retraction cord was placed and an impression was made with additional silicone (Express XT VPS, 3M) and a bite registration record was made. Provisional veneers were not fabricated as the patient was comfortable and did not want to spend extra money on it. Try-in of the veneers was done before final glazing. Laminate veneers were etched with 10%

Hydrofluoric acid (Angelus) for 20 seconds, then thoroughly washed and dried. A silane coupling agent (Monobond S, Ivoclar Vivadent) was applied for 60 seconds to etched restorations and lightly air dried. Prepared teeth were etched with 37% phosphoric acid for 15 seconds and then rinsed thoroughly with water. Bonding agent was applied to both etched teeth and silanised restorations. Now dual cure resin cement (Rely X Veneer Cement, 3M) was applied to the restorations. The restorations were placed successively on the prepared tooth and light cured. Initially it was light cured for only 2 seconds and the excess cement was removed. After that it was completely light cured for 40 seconds (Fig.5). Finally the occlusion was checked in protrusion and in lateral excursions. To avoid relapse of MMD fixed retainer made of 0.009 inch ligature wire bonded on palatal surface of maxillary central incisors. Maintenance instructions were given to the patient. The patient was very happy & satisfied with the treatment. There was a drastic change in her smile (Fig.6).

DISCUSSION

MMD is a common dental problem encountered in day to day practice. It has a negative impact on patient's personality & confident. There are a number of causes for maxillary midline diastema like tooth & arch size discrepancy, high frenum attachment, mesiodens, microdontia, abnormal oral habits, etc. Proper diagnosis & identification of the cause is of utmost important in providing correct treatment. Tooth-size discrepancy, as in our case, is a major cause of diastema (Oesterle and Shellhart, 1999). The available treatment options were orthodontic treatment, indirect ceramic veneers, direct composite veneers & full coverage restorations. As there was relative microdontia with upper lateral incisors in our case and due to time and money constraint only orthodontic treatment was not acceptable. Also only veneer treatment would have resulted in abnormally large central incisors in comparison with the lateral incisors. Also it would have resulted in overcontoured emergence profile in the interproximal area (Schmitz *et al*., 2001). Hence space redistribution with orthodontic appliance followed by veneers was the final treatment plan decided. Direct composite veneers have less wear resistance and are susceptible to staining (Viswambaran *et al*., 2015). On the other hand ceramic laminates have advantages of better strength, wear resistance, optical properties, color stability & biocompatibity with the soft tissues. Hence, ceramic laminates were selected over composite laminates (Porcelain Laminate Veneers, 2014). Carefully placed porcelain laminate veneers have reported very high survival rates of over 91% after 10 years (Porcelain Laminate Veneers, 2013).

Taking the golden proportion and the present dimensions of the tooth into consideration, it was decided to close the MMD by 2mm by orthodontic movement. One mm of space was left between the central incisors so as to provide proportionate smile to the patient. Incisal wrap design was used for better survival, incisal edge aesthetics and adequate seating of the restoration (Albanesi *et al*., 2016). Emax ceramic laminates were used. It is a lithium disilicate based ceramic emerging as a restorative material of choice for single unit indirect restorations due to its versatility & lifelike experience (Tysowsky, 2009). Relapse is an unwanted outcome after orthodontic treatment and retention. The relapse of the maxillary median diastema after orthodontic space closure, however, might be as great as 50%. Fixed permanent retention has been suggested to minimize relapse in cases of MMD closure. Hence fixed permanent retention was used in our case (Mattos *et al*., 2012).

Conclusion

Porcelain laminate veneers have appeared as a miracle in treatment of such cases. The orthodontic treatment allowed us to properly reposition and align the central incisors. It also decreased the need of aggressive tooth preparation to achieve acceptable contacts and contours. In this case, accurate diagnosis & treatment enabled us to provide a life-changing diastema closure treatment to the patient.

REFERENCES

Viswambaran, M., Londhe, S.M. Kumar, V. Conservative and esthetic management of diastema closure using porcelain laminate veneers. *Med J Armed Forces India*, 2015 Dec; 71(Suppl 2):S581-5.

Albanesi, R.B., Pigozzo, M.N., Sesma, N., Laganá, D.C., Morimoto, S. 2016. Incisal coverage or not in ceramic laminate veneers: A systematic review and meta-analysis. *J Dent.* 2016 Sep;52:1-7.

Maxillary midline diastemas: A look at the causes. Oesterle LJ1, Shellhart WC. *J Am Dent Assoc*., 1999 Jan; 130(1):85-94.

Porcelain Laminate Veneers – A Panacea for a Decrepit Smile. Clinical Dentistry Mumbai. February 2014

Porcelain Laminate Veneers: A Minimally Invasive Esthetic Procedure

Mattos, C.T., da Silva, D.L., Ruellas, A.C. 2012. Relapse of a maxillary median diastema:closure and permanent retention. *Am J Orthod Dentofacial Orthop.,* Jan; 141(1):e23-7.

Schmitz, J.H., Coffano, R., Bruschi, A. 2001. Restorative and orthodontic treatment of maxillary peg incisors: a clinical report. *J Prosthet Dent.*, Apr; 85(4):330-4.

Tajammul Ahmed. *Journal Of Evolution Of Medical And Dental Sciences*/ Volume 2/ Issue 45/ November 11, 2013.

Tysowsky, G.W. 2009. The science behind lithium disilicate: a metal-free alternative. Dent Today. Mar;28(3):112-3.

Chu, C.H., Zhang, C.F., Jin, L.J. 2011. Treating a maxillary midline diastema in adult patients: a general dentist's perspective. *J Am Dent Assoc.*, Nov; 142(11) :1258-64.

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